

Initial Study

**MODESTO IRRIGATION DISTRICT
WOODLAND GENERATION STATION 2**

Application For A Small Power Plant Exemption (01-SPPE-1)

Stanislaus County, California

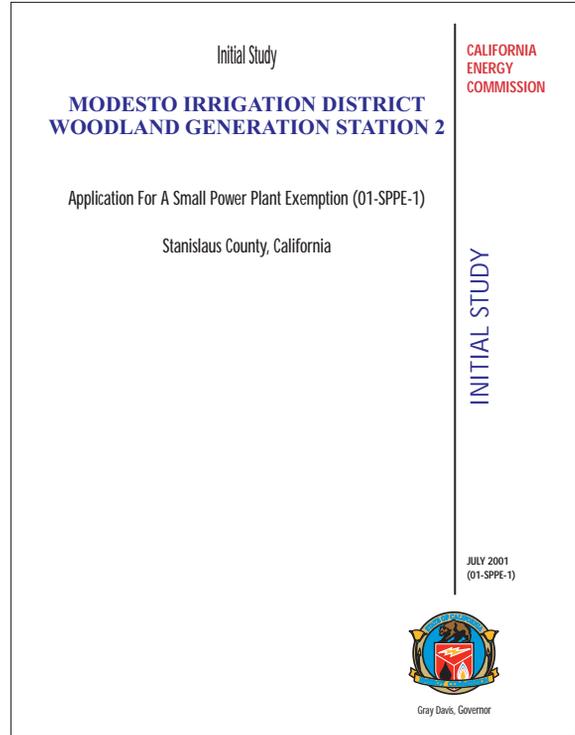
**CALIFORNIA
ENERGY
COMMISSION**

INITIAL STUDY

**JULY 2001
(01-SPPE-1)**



Gray Davis, Governor



**CALIFORNIA
ENERGY
COMMISSION**

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EXECUTIVE SUMMARY

Testimony of Susan Lee

INTRODUCTION

This Initial Study contains the California Energy Commission (Energy Commission) staff's evaluation of Woodland Generation Station 2 (WGS2) Application for Small Power Plant Exemption (SPPE). The proposed WGS2 electric generating plant is under the Energy Commission's jurisdiction and cannot be constructed or operated without the Energy Commission's exemption from certification.

Staff is an independent party in the proceedings. This Initial Study is a staff document, presenting staff's independent analysis. It examines engineering and environmental aspects of the WGS2, based on the information available at that time of document creation. This Initial Study contains analyses similar to those contained in Initial Study required by the California Environmental Quality Act (CEQA). It is not a Committee document nor is the Initial Study a final or proposed decision. The Initial Study presents staff's conclusions and proposed conditions that apply to the design, construction, and operation of the proposed facility, if certified.

BACKGROUND

On May 4, 2001, the Modesto Irrigation District (MID), filed an Application (01-SPPE-1) for SPPE for the WGS2. The Energy Commission accepted the SPPE on May 30, 2001, thus beginning the Energy Commission's review of this project.

The analyses contained in this Initial Study are based upon information from: 1) the SPPE Application for the WGS2; 2) Gas Supply Line Modifications for the MID Project; 3) responses to data requests and site visits; 4) supplementary information from federal, state, and local agencies; and 5) existing documents and publications.

The Energy Commission has made a substantial effort to notify interested parties and encourage public participation. The Energy Commission has:

- Mailed two separate Notices of Receipt to interested parties, local libraries, responsible and trustee agencies, and contiguous property owners (one notice mailed on May 10, 2001 for the Application for Small Power Plant Exemption, and one on June 6, 2001 for the Gas Supply Line Modifications);
- Mailed a Notice of Public Hearing and Site Visit on June 12, 2001 to responsible and trustee agencies, persons with contiguous property to the proposed project, and individuals that have expressed interest in the project;
- Placed an advertisement notice in the Modesto Bee on June 22, 2001 to announce the Public Hearing and Site Visit; and

- Distributed over 12,000 inserts on June 26, 2001 with the Modesto Bee for the zip code for the City of Modesto, 95354, to announce the Public Hearing and Site Visit.

PROJECT DESCRIPTION

MID is proposing to construct and operate the WGS2. The WGS2 facility will occupy approximately a 2.5-acre portion of a 7-acre site, which includes an existing 49.4 MW generating facility, Woodland 1, in the City of Modesto. The existing plant and adjacent site are located at 920 Woodland Avenue in Modesto, California (Section 30, Township 3 South, Range 9 East in Stanislaus County). The proposed WGS2 will be an 80 MW nominal natural gas-fired, combined-cycle, generating facility that will consist of 58 MW generated for base load and an additional 22 MW generated for peak load capacity. The proposed facility will use a single 47 MW GE LM6000 enhanced SPRINT combustion turbine generator (CTG) with inlet air chilling operating in combined-cycle with a nominal 37 MW steam turbine-generator (STG). Since there is an existing generating facility on the site proposed for WGS2, natural gas, water, and transmission lines already exist but will need to be upgraded to accommodate the proposed new power plant. A more complete description of the project, including a description and maps of the transmission, water, and natural gas pipeline upgrades, is contained in the **PROJECT DESCRIPTION** section of this Initial Study.

STAFF'S ASSESSMENT

Each technical area section of the Initial Study contains a discussion of impacts, and where appropriate, mitigation measures presented in the form of conditions of exemption. The Initial Study includes staff's discussion of:

- The environmental setting surrounding the project area;
- 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;
- Compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation; and
- Proposed conditions of exemption, where these can be identified at this time.

In this Initial Study, the staff has completed its analyses and has made recommendations in all of the technical areas. The table on the following page presents a summary of the potential impacts of the WGS2. For each environmental and engineering discipline, the greatest level of impact for all checklist items is shown. Staff believes that if the Conditions of Exemption recommended herein are

implemented, WGS2 will be in compliance with the applicable LORS, and no significant adverse direct, indirect, or cumulative impacts will occur.

Staff also evaluated the potential for disproportionate impacts on minority and low-income communities. While one census tract was identified that met Environmental Justice criteria, no significant, unmitigable impacts were identified in either the Air Quality or Public Health analyses. Therefore there would be no disproportionate impacts on minority or low-income populations.

While no significant impacts that cannot be mitigated have been identified, many of the impact conclusions are subject to the Applicant's acceptance of Conditions of Exemption that are presented herein. If all of these conditions are not met, staff believes that several impacts would be potentially significant.

STAFF RECOMMENDATION

The staff has concluded that, with the implementation of all conditions as recommended herein, the WGS2 Project fully complies with LORS and CEQA.

Summary of Conclusions: Environmental and Engineering Checklist

	Potentially Significant Impact	Less Than Significant Impact With Mitigation	Less Than Significant Impact	No Impact
ENVIRONMENTAL				
Agricultural Resources			X	
Air Quality		X		
Biological Resources		X		
Cultural Resources		X		
Energy Resources			X	
Geology and Soils, Mineral Resources and Paleontology		X		
Hazardous Materials and Waste			X	
Hydrology and Water Quality		X		
Land Use and Recreation			X	
Noise		X		
Public Health			X	
Socioeconomics				X
Traffic & Transportation		X		
Visual Resources		X		
ENGINEERING				
Transmission Line Safety and Nuisance			X	
Transmission System Engineering		X		

PUBLIC REVIEW

Staff is accepting public comment on this draft Initial Study until July 17, 2001. Comments on this document may be submitted to the Energy Commission's Project Manager at the address listed below and/or presented at the July 11, 2001 Draft Initial Study Workshop (to be held from 1:00 p.m. to 7:00 p.m. at the MID Multi-Purpose Room, 1231 Eleventh Street, Modesto). In late July, a Mitigated Negative Declaration will be issued ([incorporating responses to comments on the Initial Study](#)), and a 30-day public comment period will follow.

For further information or to submit written comments, please contact:

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WOODLAND GENERATING STATION 2 (01-SPPE-1)
INITIAL STUDY

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INTRODUCTION

The Applicant, Modesto Irrigation District (MID) filed a request for a Small Power Plant Exemption (SPPE) with the California Energy Commission (Energy Commission) on May 4, 2001. The Energy Commission has appointed a Committee to hear the case. An Informational Hearing was held at the Modesto Irrigation District Headquarters on June 28, 2001.

California's Warren-Alquist Act (Public Resources Code (PRC) section 25000 et seq.) gives the Energy Commission the exclusive power to certify all sites and related facilities for thermal electrical power plants of 50 MW or more within the state (PRC sections 25120 and 25500 et seq.). Section 25541 of the Warren-Alquist Act allows the Energy Commission to exempt power plants up to 100 MW from the site certification process if it finds that no substantial adverse impact on the environment or energy resources will result from the construction or operation of the proposed facility.

The proposed WGS2 is also subject to the requirements of the California Environmental Quality Act (CEQA) (PRC section 21000 et seq.). PRC section 25519 (c) states that the Energy Commission shall act as lead agency under CEQA for projects that it either certifies or exempts from certification. Staff has prepared this Initial Study in accordance with CEQA and Title 20, California Code of Regulations (CCR) section 1934 et seq. and 2300 et seq.

Staff's environmental analysis in the Initial Study documents the factual basis for staff's recommendation regarding the project's potential to result in significant adverse impacts on the environment.

Staff has included Conditions of Exemption in various technical areas, which if implemented along with the Applicant's proposed mitigation measures, should ensure that the project would result in no substantial adverse impact. In addition, staff will adopt a reporting or monitoring program designed to ensure compliance during project development and avoid significant impacts or the need for further mitigation.

The Energy Commission's Siting Committee (Committee) will conduct a hearing at which all parties will have an opportunity to comment on the Initial Study and make recommendations on the SPPE application. The Committee will consider the application, staff's analysis, and any other evidence presented in the proceedings to determine whether to recommend granting the SPPE. Following the hearing, the Committee will prepare and publish a proposed decision. The full Commission will then hold a hearing for final arguments and render a decision on the application.

Title 14, CCR section 15063 (d) states that an Initial Study shall contain the following items:

- A description of the project including the location of the project;
- An identification of the environmental setting;

- An identification of environmental effects by use of a checklist, matrix, or other method, provided that entries on a checklist or other form are briefly explained to indicate that there is some evidence to support the entries;
- A discussion of the ways to mitigate the significant effects identified, if any;
- An examination of whether the project would be consistent with existing zoning, plans, and other applicable land use controls; and
- The name of the person or persons who prepared or participated in the Initial Study.

The Energy Commission has made a substantial effort to notify interested parties and encourage public participation. The Energy Commission has:

- Mailed two separate Notices of Receipt to interested parties, local libraries, responsible and trustee agencies, and contiguous property owners (one notice mailed on May 10, 2001 for the Application for Small Power Plant Exemption, and one on June 6, 2001 for the Gas Supply Line Modifications);
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Written comments on this Initial Study may be mailed, faxed, or e-mailed to the addresses below.

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PROJECT DESCRIPTION

Testimony of Rebecca Morgenstern

PROJECT TITLE

Woodland Generating Station 2, Application for Small Power Plant Exemption

LEAD AGENCY NAME AND ADDRESS

California Energy Commission
Energy Facilities Siting and Environmental Protection Division
1516 Ninth Street
Sacramento, CA 95814

PROJECT LOCATION

The proposed project would be located in Modesto, California. The proposed Woodland Generating Station 2 (WGS2) facility will occupy approximately a 2.5-acre portion of a 7-acre site, which includes an existing 49.4 megawatt (MW) generating facility, Woodland 1. The existing plant and adjacent site are located at 920 Woodland Avenue in Modesto, California. The land use at the project site is designated as a Redevelopment Planning District. The land uses in the project vicinity are both developed and undeveloped industrial land in the City of Modesto and commercial, residential, public right-of-way (ROW), public facilities, and parks in Stanislaus County. Proposed new natural gas line segments to support the project would be located in the City of Ripon and in unincorporated San Joaquin County. Modesto Irrigation District (MID) will develop, build, own, and operate the WGS2 to serve residential, industrial, and commercial customers in and around the City of Modesto and in neighboring areas in Stanislaus and San Joaquin Counties.

PROJECT SPONSOR'S NAME AND ADDRESS

Modesto Irrigation District
1231 Eleventh Street
PO Box 4060
Modesto, CA 95352

GENERAL PLAN DESIGNATION

Redevelopment Planning District (Modesto Redevelopment Plan)

ZONING

Light Industrial (M-I)

DESCRIPTION OF PROJECT

INTRODUCTION

On May 4, 2001, MID filed an Application for a Small Power Plant Exemption for the WGS2. The proposed WGS2 will be an 80 MW nominal natural gas-fired, combined-cycle, generating facility that will consist of 58 MW generated for base load and an additional 22 MW generated for peak load capacity. The WGS2 power plant will use either a convention drum-type heat recovery steam generator (HRSG) or a once-through steam generator (OTSG) HRSG. The HRSG and OTSG HRSG systems and their differences are described below.

Since there is an existing facility, Woodland 1, on the site proposed for WGS2, natural gas, water and transmission lines already exist but will need to be upgraded to accommodate the proposed power plant. Pacific Gas and Electric Co. (PG&E) will deliver the natural gas required for the proposed power plant through the existing gas line connection to the Woodland 1 plant. However, because of the increased capacity needed to serve WSG2 plant, two segments of approximately 6.25 miles to gas pipelines in San Joaquin County will need to be reinforced. The WGS2 site will also require 1.36 miles of new transmission line. WGS2 will use raw water from MID's Water Treatment Plant for makeup process, cooling, and domestic use.

PROJECT SITE AND LOCATION

The approximately 2.5-acre proposed project site is on MID property on the southeast corner of Woodland Avenue and Graphics Drive, in central Modesto. Graphics Drive would be the primary access for both the Woodland 1 and WGS2 power plants. MID already owns the WGS2 site and currently uses the site for storage. The site is bordered by the existing Woodland 1 facility to the north, Graphics Drive to the west, 9th Street and the Union Pacific Railroad tracks to the east, and the vacant FMC Corporation site to the south.

The existing facility has a 10-foot-high wall along the north and east perimeter; an 8-foot-high chain link fence along the west perimeter; and a 10-foot-high chain link fence along the south perimeter. The new facility would have similar surroundings. The existing plant is paved, with all stormwater collected and sent to a stormwater percolation basin. The existing stormwater basin has adequate capacity for the proposed plant.

The WGS2 site, subtransmission line, and water pipeline are within the City of Modesto. **Project Description Figure 1** is a map of the WGS2 site and the surrounding area, the transmission line route, and the water supply line. The proposed upgrades to transmission lines, water pipelines, and gas pipelines are described in detail below.

[INSERT Figure 1: Project Site, Transmission Line, and Water Supply Line]

WATER SUPPLY AND USE

The average daily water demand for the WGS2 is approximately 290 gallons per minute (gpm) and the approximate maximum daily water demand is 705 gpm. WGS2 will use water transported from Modesto Regional Water Treatment Plant at MID's Reservoir. Water will be used at the plant for cooling process make-up to the WGS2 site and domestic water uses. A new 10-inch underground pipeline be constructed to the WGS2 site, starting from the existing canal, 'Lateral 4' (near the corner of 9th Street and Kansas Avenue), and will run for approximately one mile. The new waterline will be buried in or adjacent to Kansas and Graphics Avenues.

LINEAR FACILITIES

TRANSMISSION

Approximately 1.2 miles of 69 kV subtransmission line improvements (new, taller poles replacing existing poles) will be required starting from the existing facility and ending about one mile southeast at MID's Enslin Substation. The transmission line improvements will follow an existing transmission line route that currently connects Woodland 1 with the substation.

The project will require the installation of approximately 35 new wood poles and the removal of existing poles. The proposed conductors will be larger diameter than the existing conductors. No construction will be required at the Enslin Substation; project construction activities will terminate at either a wood pole or a steel tower (which will need to be upgraded) currently existing outside of and just southwest of the substation.

The transmission line improvements will start on the north side of Woodland Avenue (across the street from the MID site), then follow the west side of North 9th Street on the west side of the existing Union Pacific railroad tracks on private property. From the west side of North 9th Street, the new 69 kV line will turn north at Tully Road. The alignment will run north along Tully Road, on the west side of the road, for approximately 0.05 mile to its intersection with Stoddard Avenue. The alignment will turn east onto the south side of Stoddard Avenue and continue east for approximately 0.4 mile to its intersection with Terminal Avenue. The alignment will continue northeast along Terminal Avenue for approximately 0.2 mile, along the existing MID irrigation canal that parallels Terminal Avenue on its east side, and then terminate at the Enslin Substation.

NATURAL GAS

Natural gas, which will be the only fuel required for the facility, will be delivered via the existing 1,500 high pressure (HP) gas compressors that already serve the Woodland 1 generating station. The compressors will be used to boost the natural gas pressure to 700 pounds per square inch gauge (psig) at the combustion turbine inlet to WGS2. The existing compressors have sufficient capacity to achieve adequate pressure to operate both projects simultaneously.

Two segments of gas pipelines in San Joaquin County (within and west of the City of Ripon) will need to be constructed to meet the increased capacity required to serve the proposed WGS2. **Project Description Figures 2 and 3** show the proposed routes for the gas line improvements. The gas pipeline enhancements will include: 1) approximately 3.25 miles of 12-inch diameter reinforcement to PG&E's Ripon-Modesto Distribution Feeder Main (DFM) (west and south of downtown Ripon), and 2) approximately 3 miles of new pipeline parallel to PG&E's Line 108 through agricultural fields west of Ripon.

The proposed new pipeline segments will be designed, constructed, and operated in accordance with national safety codes and the safety standards for new gas pipelines stated in the California Public Utility Commission's General Order (G.O.) 112-E. An operations and maintenance plan will be prepared by PG&E addressing both normal procedures and conditions, and any upset or abnormal conditions that could occur.

The pipeline segments will be under a continuous cathodic protection system and periodic cathodic protection surveys will be performed by PG&E. There will be markers to identify the pipeline locations and posting a toll-free number to call prior to any excavation that may occur around the pipeline. In addition, the gas will be odorized as it is received from PG&E's main pipeline. The new pipeline segments will also be equipped with strategically located pressure transmitters, which will sound an alarm at the PG&E control center if there is a drop in pipeline pressure which could indicate a leaking pipeline.

REINFORCEMENT TO THE RIPON-MODESTO DISTRIBUTION FEEDER MAIN

PG&E will install approximately 3.25 miles of steel pipe beginning at the intersection of South Austin Road and West Ripon Road, approximately 2 miles west of the Ripon City Limit, and ending in Ripon at the intersection of South Vera Avenue and Doak Boulevard, as illustrated in **Project Description Figure 2**. From its tap to the Ripon-Modesto DFM, the pipe will travel easterly along West Ripon Road, south on Jack Tone Road and westerly along Doak Boulevard to South Vera Avenue. At South Vera Avenue, the new pipeline will interconnect with PG&E's existing Ripon-Modesto DFM. A 16-inch pipeline will be installed from Austin Road to Jack Tone Road. A 12-inch line will be installed along the remainder of the route. The pipeline will be located within, or immediately adjacent to, City and County streets. PG&E has not yet determined which side of the streets the pipeline will be placed; therefore, MID is requesting approval for the line to be placed on either side of the street.

Pipeline construction will require approximately a 30-foot construction corridor. The depth of the trench will range from 4 to 8 feet depending on where the pipeline is located and what other infrastructure may be located nearby. During trenching, the excavated soil is piled on one side of the trench and then used for backfilling after the pipeline is installed in the trench. A traffic control plan will be prepared by PG&E to ensure that traffic impacts associated with the pipeline are minimized and to ensure that driveways along the construction route are accessible.

[INSERT Figure 2: Gas Line Route Ripon Modesto]

[INSERT Figure 3: Gas Line Route 108]

The route for the Distribution Feeder Main is confined to existing paved roadways with the exception of the short section from the extension of Doak Road to the extension of Vera Road. This area is presently being developed and a new road is under construction. Therefore, the construction of the gas pipeline would not cause additional impacts beyond those associated with the existing development.

LINE 108 REINFORCEMENT

The reinforcement to PG&E's Line 108 consists of installing 3 miles of new pipeline beginning at the PG&E McMullin Ranch Mixing Station and ending at the local Ripon-Modesto DFM, which parallels West Ripon Road (see **Project Description Figure 3**).

MID is requesting approval for a 200-foot-wide pipeline study corridor located adjacent to the existing Line 108. The 200-foot study corridor will allow PG&E to place the pipeline anywhere within that 200-foot strip and also have a buffer during construction of the pipeline. The new pipeline will be located mostly in agricultural fields, with the exception of the southernmost half-mile of the route, which will be located along South Airport Way. The pipeline segments will be buried in a trench about 4 to 8 feet deep, but the Horizontal Directional Drill (HDD) construction method will be used in certain locations, as defined below.

The new Line 108 pipeline will cross two irrigation ditches that supply water to neighboring farm fields. One irrigation ditch is along East Perrin Road and is currently spanned by Line 108. The other irrigation ditch is located adjacent to an unnamed farm road near East Trahern Road, and the pipeline crosses it within a road that crosses the ditch. Construction through or over these ditches and the roads that run parallel to them will be avoided by using the HDD construction method.

Directly south of West Ripon Road, existing Line 108 is located within a narrow ROW between a house and a mobile home. There is not sufficient space in this area to add a new adjacent pipeline. As a result, PG&E intends to locate the new line either in agricultural land east of the mobile home and the house. PG&E may interconnect the reinforcement with Line 108 immediately south of the mobile home and the house. The specific route of the portion of the pipeline in this area will be determined during detailed design.

HORIZONTAL DIRECTIONAL DRILL (HDD) CONSTRUCTION METHOD

HDD involves specialized construction procedures in which a hole is drilled for the pipeline so that no trenching is required. The HDD equipment initially drills a pilot hole, which is followed by a pilot hole drill string. A reaming device is attached to the drill string and pulled through the pilot hole. The reamer enlarges the pilot hole to 35 to 50 percent greater diameter than the final pipeline size. The pipeline is then welded, radiographed, hydrotested, and pulled through the enlarged borehole.

Drilling mud will be used as part of the HDD process to lubricate and cool the drill. The mud is non-toxic and consists of bentonite. The drilling mud will be collected at

the directional drilling site and either disposed of at a Class III landfill or given to a farmer to use as a soil amendment.

PROJECT COMPONENTS

COMBUSTION TURBINE GENERATOR

The plant will use a single 47 MW GE LM6000 enhanced SPRINT combustion turbine generator (CTG) with inlet air chilling operating in combined-cycle with a nominal 37 MW steam turbine generator (STG). The plant net output will have a nominal duct-fired rating of 80 MW when fully duct fired, and a nominal rating of 58 MW when the duct burner is shut down. When complete, the Woodland 1 and WGS2 facilities will have a combined net output of approximately 130 MW. One of two alternative types of steam generation methods, drum-type HRSG System or OTSG HRSG System, is proposed for the project. MID has not determined if a drum-type HRSG system or OTSG HRSG System would be used and is therefore seeking approval to use either one. **Project Description Figures 4 and 5** are artist's renderings of the drum-type HRSG System and OTSG HRSG System, respectively.

HRSG SYSTEM

Project Description Figure 6 illustrates the plot plan for the drum-type HRSG System and **Project Description Figure 7** shows the elevation of the drum-type HRSG System. Exhaust gases from the combustion turbine will be used to generate high pressure (HP) and low pressure (LP) steam. The planned operation for the plant will use HRSG/STG sliding pressure for efficient steam cycle operation. The range of HP pressure and temperature will be 475 pounds per square inch gauge (psig)/750°F unfired to 1,250 psig/950 °F when the duct is fully fired to 1,500°F. Variable speed feedwater pumps are planned for energy efficiency due to HRSG sliding pressure operation. The main steam condenser will use integral deaeration. The condensate system collects the condensed turbine exhaust steam and provides deaerated water to the HRSG through the condensate pumps.

OTSG HRSG SYSTEM

The operation of the OTSG HRSG will be identical to the operation of the drum-type HRSG, except there is no blowdown system in an OTSG HRSG System. Since the OTSG HRSG requires ultra-pure make-up water, the condensate return system for the OTSG HRSG will include a full flow condensate polisher. The OTSG HRSG will also use sliding pressure control for efficient operation. **Project Description Figure 8** illustrates the plot plan for the OTSG HRSG System and **Project Description Figure 9** shows the elevation of the OTSG HRSG System.

HRGS SYSTEM VERSUS THE OTSG HRSG SYSTEM

Both the drum-type HRSG and the OTSG HRSG systems will use a 2-pressure unit and use a duct burner. Thermodynamically, there is little difference between the two technologies. The two systems can be compared using the plot plans and

[INSERT Figure 4 Artist Rendering HRSG]

[INSERT Figure 5 Artist Rendering OTSG]

[INSERT Figure 6: Plot Plan for HRSG]

[INSERT Figure 7: Elevation for HRSG]

[INSERT Figure 8: Plot Plan OTSG]

[INSERT Figure 9: Elevation OTSG]

elevations illustrated in **Project Description Figures 6 and 7** for the drum-type HRSG System and **Project Description Figures 8 and 9** for the OTSG HRSG System.

The HRSG System has a higher installation cost than the OTSG HRSG, but the OTSG HRSG has a higher capital cost. The OTSG HRSG does not require either steam drums or a blowdown system, but the HRSG System requires both the blowdown system and steam drums. In the event of a water shortage, the CTG on the OTSG HRSG System can operate dry in simple-cycle, which increases reliability; however the OTSG HRSG requires ultra pure feedwater, which will require a full-flow condensate polisher system. The HRSG System has an easier selective catalytic reduction system (SCR) and carbon monoxide (CO) catalyst change-out procedure.

EMISSION CONTROLS

The WGS2 project will be equipped with Best Available Control Technology (BACT) to control air pollutant emissions. These controls include a water injection system to reduce the nitrogen oxide (NO_x) emissions from the CTG exhaust and a NO_x SCR to reduce emissions to 2.5 parts per million (ppm) at full load. The SCR system uses aqueous ammonia as a reagent for an ammonia injection system and an oxidation catalyst to maintain a CO emission limit of 6.0 ppm in all operating conditions. In addition, there will be a continuous emission monitoring system for the exhaust stack.

CONSTRUCTION SCHEDULE AND WORKFORCE

If approved by the Energy Commission, MID expects to begin construction of the project by the winter of 2001 and complete it by the spring of 2003. The Applicant anticipates beginning full-scale commercial operation to commence in the summer of 2003.

MID estimates the capital costs of the WGS2 to be \$60 million. MID expects to employ an average construction workforce of 72 workers and a peak construction workforce of 97 workers in the eighth and ninth months of construction. There will also be a workforce of 71 workers during peak construction for the gas line reinforcements. Construction payroll costs are estimated to be \$8.9 million while annual operations payroll is expected to be \$280,000 for an additional four plant workers.

AGRICULTURE RESOURCES

Testimony of Negar Vahidi

INTRODUCTION

The agriculture resources section discusses potential impacts of the proposed WGS2 and its associated linear facilities on agricultural lands.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

STATE

CALIFORNIA LAND CONSERVATION ACT OF 1965

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space uses. The landowner commits the parcel to an annually renewing ten-year period wherein no conversion out of agricultural use is permitted. In return, the land is taxed at a rate based on the actual use of the land for agricultural purposes, as opposed to its unrestricted market value. Participation in the Williamson Act program is dependent on county adoption and implementation of the program, and is voluntary for landowners.

The Farmland Security Zone is additional agricultural land conservation legislation that went into effect August 24, 1998. This program allows local governments and landowners to rescind a Williamson Act contract and simultaneously place the farmland under a Farmland Security Zone contract, which has an initial term of at least 20 years. A Farmland Security Zone contract offers landowners greater property tax reduction than the Williamson Act by valuing enrolled real property at 65 percent of its Williamson Act valuation, or 65 percent of its Proposition 13 valuation, whichever is lower.

FARMLAND MAPPING AND MONITORING PROGRAM

The California Department of Conservation established the Farmland Mapping and Monitoring Program (FMMP) in 1982 in response to a critical need for assessing the location and quantity of agricultural lands and conversion of these lands to other uses. It is the only statewide land use inventory conducted on a regular basis that identifies the conversion of agricultural land to urban and other uses. Every even numbered year FMMP issues a Farmland Conversion Report. FMMP data is used in elements of some county and city general plans, in environmental documents as a way of assessing project impacts on Prime Farmland, in regional studies on agricultural land conversion, and in assessing impacts of proposed power plant projects reviewed through the Energy Commission's environmental review process (which is similar to the CEQA process).

LOCAL

CITY OF MODESTO URBAN AREA GENERAL PLAN

The Modesto General Plan governs land uses within Modesto's Sphere of Influence. The Urban Reserve designation is used to prevent the premature conversion of agricultural land to urban uses and to ensure that future urban development is orderly, consistent with the City's policies, and is supported by adequate facilities. It is the City's policy that land designated as Urban Reserve be used for agricultural purposes until its use and development is established through the approval of a General Plan amendment, rezoning, and annexation to the City; or alternatively, through the "Villages" where a Specific Plan prepared by the City will precede urban development.

STANISLAUS COUNTY GENERAL PLAN

The Stanislaus County General Plan gives jurisdiction over agricultural lands to Stanislaus County for all lands outside of a city's Sphere of Influence as delimited in January 1, 1995 (Base Year). Pursuant to the Land Use Element (Goal 1, Policy 2), Stanislaus County regulations seek to preserve agricultural land for uses that are compatible with agricultural practices, including natural resources management, open space, outdoor recreation, and enjoyment of scenic beauty.

SAN JOAQUIN COUNTY GENERAL PLAN

The objectives of the San Joaquin County General Plan are intended to protect agricultural lands for the continuation of commercial agricultural enterprises, small-scale farming operations, and the preservation of open space. The plan also identifies and classifies agricultural lands with small-scale farming operations and dwellings and seeks to minimize impacts to agriculture from urban development. The County implements its agricultural policies through participation in the FMMP and use of this information in the project planning and approval process.

SETTING

The 2.5-acre WGS2 site is located within the City of Modesto in the eastern portion of Stanislaus County, California. This site is currently used as a material storage area and is immediately adjacent to the existing MID Woodland 1 generating facility. The proposed project would connect to the MID 69 kV grid via an existing 69 kV subtransmission line and with a 1.2-mile 69 kV subtransmission line along an existing power line corridor. In addition, an underground water supply pipeline will be constructed to provide water to the WGS2. The project also includes two segments of new Pacific Gas and Electric (PG&E) underground gas pipelines in San Joaquin County, in and near the City of Ripon.

A map of important farmland from the City of Modesto Master EIR for the Urban Area General Plan shows some farmland in the overall area. However, no cropped areas within the City of Modesto's Sphere of Influence would be affected by the proposed project.

One of the natural gas pipeline routes located in San Joaquin County would pass through active agricultural lands. Some of the soil mapping units along these alignments are also designated as Prime Farmland¹ (MID 2001a, p. 8.9-8). The second proposed gas pipeline route would utilize existing public utility ROWs (i.e., existing roadways). Construction of the new gas lines involves the trenching and laying of an additional pipeline alongside the existing lines. The 16-inch line traversing north-south from South Airport Way to West Ripon Road would occur in agricultural fields, with the exception of the first half-mile of the route, which would be located along South Airport Way (MID 2001b, p. 2). The 12-inch reinforcement to PG&E's Distributed Feeder Main would proceed into the City of Ripon, along existing public roadways, as it traverses east, and south.

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
AGRICULTURE RESOURCES -- In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?			X	
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?			X	
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?			X	

DISCUSSION OF IMPACTS

A. Conversion of Farmland to Non-Agricultural Use: Less Than Significant Impact

The WGS2 would be located on lands designated for industrial development similar to its surrounding land uses. In addition, the proposed routes for the electrical subtransmission line and water pipeline line occur in existing public ROWs currently used for either the railroad, public streets, or water conveyance. Therefore, these

¹ The U.S. Department of Agriculture, Soil Conservation Service, has identified Prime Farmland as land that has the best combination of physical and chemical properties for the production of crops.

facilities would not convert any farmlands to non-agricultural use. No impacts to agricultural resources would occur.

In general, the proposed gas pipeline routes would utilize existing public utility ROWs (i.e., existing roadways or pipeline ROWs). There are areas within San Joaquin County along the proposed natural gas pipeline alignments that are considered as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps for the Farmland Mapping and Monitoring Program. However, nearly 4 miles of the 6.25 miles of pipeline alignments occur within the unfarmed field margins along existing roadways (e.g., Ripon Road, Airport Way).

The portions of the Line 108 alignment that are currently being used for agricultural production (i.e., northern two-thirds of the alignment) would have temporary impacts during construction, but would not be permanently converted to non-agricultural uses as a result of this project. To provide PG&E flexibility in the construction and placement of Line 108, MID is requesting approval for a 200-foot-wide pipeline corridor located adjacent to the existing Line 108 ROW (MID 2001b, p. 2). The 200-foot-wide corridor would only be utilized during construction for staging of equipment and pipe laydown activities. There would be a permanent 15 to 25 foot wide easement for the pipeline itself (Strachan, 2001).

In areas where agricultural land would be disturbed, the disturbance would be limited to construction activities, which are temporary, and the soil surface would be returned to the original grades. Therefore, no existing farmlands would be converted to non-agricultural use. Impacts would be less than significant.

B. Conflict with Agricultural Zoning: Less Than Significant Impact

The proposed WGS2 would be located in an area intended for industrial development based on its land use and zoning designation. The proposed WGS2 would represent an urban in-fill project, consistent with City of Modesto policies on economic development for the Redevelopment Project area and contiguous urban development. In addition, installation of the electrical subtransmission line and water pipeline is consistent with the City of Modesto's policy on the use of public ROWs for public utility activities typically found in public ROWs. As described above in Item A., the proposed new gas pipeline segments would utilize existing public utility ROWs (i.e., existing roadways or pipeline ROWs). These existing ROWs are not subject to contracts associated with the Williamson Act.

The proposed project is consistent with the General Plan designation and established zoning for affected areas, and would not require changes that would violate existing Williamson Act contracts. Therefore, impacts would be less than significant.

C. Cause Changes That Result in Loss of Farmland: Less Than Significant Impact

Potential impacts from the proposed project evaluated in this Initial Study include impacts on air quality, noise, and traffic and transportation. None of the impacts

identified for these study areas would involve significant disruption of neighboring land uses such that nearby agricultural uses would be severely disrupted, or made untenable.

As described above, there are no agricultural uses on-site, adjacent to, or nearby, proposed facilities (i.e., WGS2, and subtransmission line and water pipeline) within the City of Modesto. Therefore, the proposed project would not cause a conversion of land from agricultural uses. Disturbance to agricultural lands adjacent to, and nearby, the new gas pipeline reinforcements would be short-term and temporary resulting from construction activities. Any lands trenched for these pipeline reinforcements would be returned to their original state, and agricultural uses could continue over the pipeline.

The proposed project is consistent with the General Plan designation and established zoning for the areas affected by the proposed project, and would not involve the extension of urban services to agricultural lands or properties. The project would not involve other changes that could result in conversion of farmland to non-agricultural uses, and the impact is, therefore, less than significant.

CUMULATIVE IMPACTS

Cumulative impacts may be caused if a project would have effects that are individually limited but cumulatively considerable when viewed together with the effects of related projects. As described in the Land Use and Recreation section of this Initial Study, only three projects are proposed to occur in the vicinity of the proposed project and all are located within the City of Modesto. As discussed earlier in this section on agricultural resources, the proposed project would have no significant impacts on agricultural resources. In addition, the proposed project does not appear to make a significant contribution to regional impacts related to new development and growth, such as population immigration, increased demand for public services, expansion of public infrastructure, or loss of open space. In areas where the proposed new gas pipeline segments would traverse agricultural lands, impacts would be temporary and less than significant. Therefore, the proposed project's contribution to impacts resulting from past, present, and probable future projects also are not expected to be cumulatively considerable. Staff concludes there are no cumulative impacts to agricultural resources as a result of the proposed project.

CONCLUSIONS

Based on the discussion above, impacts on agricultural resources are determined to be less than significant.

PROPOSED CONDITIONS OF EXEMPTION

None proposed.

REFERENCES

- City of Modesto, 1995. Final Master Environmental Impact Report for the Urban Area General Plan. Certified by the Modesto City Council Resolution No. 95-408 on August 15, 1995.
- City of Modesto, 1998. Modesto Urban Area (and environs) Zoning Map. April.
- Gomez, G. 2001. Phone communication to Natural Resource Conservation Service, Modesto Office on February 22.
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- MID (Modesto Irrigation District). 2001b. Gas Supply Line Modifications Modesto Irrigation District Project (01-SPPE-1). Submitted to the California Energy Commission, May 25, 2001.
- San Joaquin County, 1992. General Plan 2010, adopted by the San Joaquin County Board of Supervisors, July 29.
- Strachan, Susan. 2001. Modesto Irrigation District. Personal communication with Susan Lee, Aspen Environmental Group. June 15.
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AIR QUALITY

Testimony of William Walters

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the construction and operation of the WGS2 Project, which will be located adjacent to the existing Woodland 1 power plant in the City of Modesto, Stanislaus County.

In carrying out this analysis, the California Energy Commission staff evaluated the major issues identified in the CEQA's Air Quality Checklist. The following sections address the questions include in the Checklist.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

The federal Clean Air Act requires any new major stationary sources of air pollution and any major modifications to existing major stationary sources to obtain a construction permit before commencing construction (40 CFR 52,21). This process is known as New Source Review (NSR). Its requirements differ depending on the attainment status of the area where the major facility is to be located. Prevention of Significant Deterioration (PSD) requirements apply in areas that are in attainment of the national ambient air quality standards. The non-attainment area NSR requirements apply to areas that have not been able to demonstrate compliance with national ambient air quality standards. The entire program, including both PSD and non-attainment NSR permit reviews, is referred to as the federal NSR program.

Title V of the federal Clean Air Act requires states to implement and administer an operating permit program to ensure that large sources operate in compliance with the requirements included in the Code of Federal Regulations 40, part 70. A Title V permit contains all of the requirements specified in different air quality regulations that affect an individual project.

The WGS2 is also subject to the federal New Source Performance Standards (NSPS) for the combustion turbine (40 CFR 60 Subpart GG) and for the HRSG duct burners (40 CFR 60 Subpart Db). These two regulations have pollutant emission requirements that are less stringent than those that will be required by NSR BACT requirements.

The U.S. Environmental Protection Agency (USEPA) reviews and approves the San Joaquin Valley Air Pollution Control District's (District) regulations and has delegated to the District the implementation of the federal PSD, Non-attainment NSR, and Title V programs. The District implements these programs through its own rules and regulations, which are, at a minimum, as stringent as the federal regulations. The Title V program is administered by the District under Rule 2520. In addition, the USEPA

has also delegated to the District the authority to implement the federal Clean Air Act Title IV “acid rain” and Title V “operating permit” programs. The Title IV regulation requirements will include obtaining a Title IV permit prior to operation, the installation of continuous emission monitors to monitor acid deposition precursor pollutants, and obtaining Title IV emission trading credits. The Title V operating permit is issued only after a facility is in operation and it would be the same as the District’s Permit to Operate. Therefore, compliance with the District’s rules and regulations will result in compliance with federal requirements.

STATE

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

LOCAL

The proposed project is subject to the following District Rules and Regulations:

RULE 2201 – NEW AND MODIFIED STATIONARY SOURCE REVIEW RULE

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

SECTION 4.1 – BEST AVAILABLE CONTROL TECHNOLOGY

Best Available Control Technology is defined as: a) has been contained in any State Implementation Plan and approved by USEPA; b) the most stringent emission limitation or control technique that has been achieved in practice for a class of source; or c) any other limitation or control technique which the District’s Air Pollution Control Officer (APCO) finds is technologically feasible and is cost effective. BACT is required for NO_x, VOC, PM₁₀ and SO₂ emissions from any new or modified emission unit that exceed 2 lb/day, and CO emissions that exceed 550 lb/day. In the case of the WGS2 project, BACT will apply for NO_x, VOC, CO, SO₂, and PM₁₀ emission sources.

SECTION 4.2 – OFFSETS

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

- Oxides of Nitrogen, NO_x – 10 tons/year
- Volatile Organic Compounds, VOC - 10 tons/year
- Carbon Monoxide, CO – 550 lbs/day
- PM₁₀ – 80 lbs/day
- Sulfur Oxides, SO_x – 150 lbs/day

The WGS site (Woodland 1 and WGS2 combined) exceeds offset trigger limits for NO_x, VOC, and PM₁₀; therefore offsets are required for these three pollutants. The emission offsets provided shall be adjusted according to the distance of the offset from the WGS2. The ratios are:

- Internal or on-site source – 1 to 1
- Within 15 miles of the same source – 1.2 to 1
- 15 miles or more from the source – 1.5 to 1

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

SECTION 4.3 – ADDITIONAL SOURCE REQUIREMENTS

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

RULE 2520 – FEDERALLY MANDATED OPERATING PERMITS

Requires that a project owner file a Title V Operating Permit from USEPA with the District within 12 months of commencing operation. A project is subject to this requirement if any of the following apply: the project is a major stationary source (under Rule 2201 Major Source definition), it has the potential to emit greater than 100 tons per year of a criteria pollutant, any equipment permitted is subject to New Source Performance Standards, the project is subject to Title IV Acid Rain program, or the owner is required to obtain a PSD Permit from USEPA. The Title V Permit application requires that the owner submit information on the operation of the air polluting equipment, the emission control, the quantities of emissions, the monitoring of the equipment, as well as other information requirements.

RULE 2540 – ACID RAIN PROGRAM

A project greater than 25 MW and installed after November 15, 1990, must submit an acid rain program permit application to the District. The acid rain requirements will become part of the Title V Operating Permit (Rule 2520).

RULE 4001 – NEW SOURCE PERFORMANCE STANDARDS

Specifies that a project must meet the requirements of the Federal New Source Performance Standards (NSPS), according to Title 40, Code of Federal Regulations, Part 60, Chapter 1. This project is subject to Subpart GG, which pertains to Stationary Gas Turbines; and Subpart Db, which pertains to the HRSG duct burner. These pollutant emission limits of these regulations are less severe than the Rule 2201 BACT requirements.

RULE 4101 – VISIBLE EMISSIONS

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

RULE 4102 – NUISANCE

Prohibits any emissions “which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such person or public or which cause or have a natural tendency to cause injury or damage to business or property.”

RULE 4201 – PARTICULATE MATTER CONCENTRATION

Limits particulates emissions from sources such as the gas turbine and cooling tower to less than 0.1 grain per dry standard cubic foot of exhaust gas.

RULE 4301 – FUEL BURNING EQUIPMENT

Limits air contaminant emissions from fuel burning equipment. This rule is applicable to the HRSG. However, the combustion turbine is exempt from this rule because it produces power primarily through the mechanical turning of the turbine blades.

RULE 4305 – BOILERS, STEAM GENERATORS AND PROCESS HEATERS

Limits NO_x and CO concentrations to no greater than 30 parts per million by volume, dry basis (ppmvd) (0.036 lb/MMBtu) and 400 ppm, respectively. This rule is applicable to the HRSG. However, this rule does not apply to the combustion turbine.

RULE 4703 – STATIONARY GAS TURBINES

Establishes requirements for monitoring and record-keeping for NO_x and CO emissions from new or modified stationary gas turbines with a designed power of 0.3 MW or higher. According to this rule, at 15% O₂, NO_x, and CO concentrations must be less than 9 ppm and 200 ppm, respectively.

RULE 4801 – SULFUR COMPOUNDS

Limits the emissions of sulfur compounds to no greater than 0.2 percent calculated as SO₂ per dry standard cubic foot.

RULE 8010 – FUGITIVE DUST ADMINISTRATIVE REQUIREMENTS FOR CONTROL OF FINE PARTICULATE MATTER (PM₁₀)

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

RULE 8020 – FUGITIVE DUST REQUIREMENTS FOR CONTROL OF FINE PARTICULATES (PM₁₀), FROM CONSTRUCTION, DEMOLITION, EXCAVATION, AND EXTRACTION ACTIVITIES

Limits fugitive dust emissions during construction through establishing a requirement that visible dust emissions shall not exceed an opacity limit of 40% for a period or periods aggregating to more than three minutes in any one-hour.

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

Limits the fugitive dust emissions from the handling and storage of materials. It specifies that bulk materials be transported using wetting agents, allow appropriate freeboard space in the vehicles, or be covered. It also requires that stored materials be covered or stabilized.

RULE 8060 – CONTROL OF PM₁₀ FROM PAVED AND UNPAVED ROADS

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

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

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

The Applicant submitted an application for an Authority to Construct (ATC) with the District on May 17, 2001. The District has 30 days to determine whether the application is complete, and had not finalized its application completeness assessment at the time of the preparation of this analysis.

SETTING

CLIMATOLOGY

The climate of the northern San Joaquin Valley is characterized by hot dry summers and mild winters with relatively small amounts of precipitation. Summers are usually quite warm, with average daily maximum temperatures during July of over 94°F. Very little precipitation occurs during the summer months because the strong high pressure blocks migrating storm systems. Occasionally, tropical air moves into the area and thunderstorms may occur over the adjacent mountains. 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 these months, and stagnant conditions occur more frequently than during summer.

Wind speeds are generally higher in summer than in winter throughout the San Joaquin Valley and are typically north-northwesterly winds. During the summer, spring, 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 predominantly southeasterly. 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. Tule fog, a dense, persistent fog, is a frequent wintertime occurrence. The annual rainfall in the Modesto area is only about 12 inches and most precipitation (89%) occurs from November through April. During December and January, daily maximum temperatures are a relatively mild 53°F, with lows averaging 37°F.

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 fewer air quality impacts from a single air pollution source like the WGS2. During the winter months between storms, very stable atmospheric conditions occur, resulting in very little mixing. Under these conditions, little air pollutant dispersion occurs, and consequently higher air quality impacts result from stationary source emissions. Mixing heights are generally lower during the winter, along with lower mean wind speeds and less vertical mixing.

AMBIENT AIR QUALITY

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

AIR QUALITY: Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O ₃)	1 Hour	0.12 ppm (235 $\mu\text{g}/\text{m}^3$)	0.09 ppm (180 $\mu\text{g}/\text{m}^3$)
	8 Hour	0.08 ppm (157 $\mu\text{g}/\text{m}^3$)	—
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO ₂)	Annual Average	0.053 ppm (100 $\mu\text{g}/\text{m}^3$)	—
	1 Hour	—	0.25 ppm (470 $\mu\text{g}/\text{m}^3$)
Sulfur Dioxide (SO ₂)	Annual Average	80 $\mu\text{g}/\text{m}^3$ (0.03 ppm)	—

Pollutant	Averaging Time	Federal Standard	California Standard
	24 Hour	365 $\mu\text{g}/\text{m}^3$ (0.14 ppm)	0.04 ppm (105 $\mu\text{g}/\text{m}^3$)
	3 Hour	1300 $\mu\text{g}/\text{m}^3$ (0.5 ppm)	—
	1 Hour	—	0.25 ppm (655 $\mu\text{g}/\text{m}^3$)
Respirable Particulate Matter (PM ₁₀)	Annual Geometric Mean	—	30 $\mu\text{g}/\text{m}^3$
	24 Hour	150 $\mu\text{g}/\text{m}^3$	50 $\mu\text{g}/\text{m}^3$
	Annual Arithmetic Mean	50 $\mu\text{g}/\text{m}^3$	—
Sulfates (SO ₄)	24 Hour	—	25 $\mu\text{g}/\text{m}^3$
Lead	30 Day Average	—	1.5 $\mu\text{g}/\text{m}^3$
	Calendar Quarter	1.5 $\mu\text{g}/\text{m}^3$	—
Hydrogen Sulfide (H ₂ S)	1 Hour	—	0.03 ppm (42 $\mu\text{g}/\text{m}^3$)
Vinyl Chloride (chloroethene)	24 Hour	—	0.010 ppm (26 $\mu\text{g}/\text{m}^3$)
Visibility Reducing Particulates	1 Observation	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

The USEPA, CARB, and the local air district classify an area as attainment, unclassified, or non-attainment, depending on whether or not the monitored ambient air quality data show compliance, insufficient data available, or non-compliance with the ambient air quality standards. The WGS2 is located in the Stanislaus County and, as stated above, is under the jurisdiction of the San Joaquin Valley Air Pollution Control District. This area is designated as non-attainment for both the federal and state ozone and PM₁₀ standards. **AIR QUALITY Table 2** summarizes federal and state attainment status of criteria pollutants for San Joaquin Valley Air Basin.

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

Pollutant	Attainment Status*	
	Federal	State
Ozone	Non-attainment/Serious	Non-attainment/Severe
CO	Unclassified/Attainment	Attainment
NO ₂	Unclassified/Attainment	Attainment
SO ₂	Unclassified	Attainment
PM ₁₀	Non-attainment/Serious	Non-attainment
Lead	No Designation	Attainment

* Obtained from 40 CFR 81 and SJVUAPCD web site (www.valleyair.org).

The ambient air quality data for the proposed project were obtained by the Applicant from a total of four monitoring stations. Air quality data for NO₂, O₃, CO, and PM₁₀ were obtained from two stations located in Modesto (14th Street station and I Street station – PM₁₀ only). Since the Modesto stations do not monitor SO₂ and particulate sulfate, air quality data for these pollutants were obtained from a monitoring station located in Bethel Island (45 miles to the northwest), and Bakersfield (200 miles to the

southeast), respectively, as the representative data for the project site. The Bethel Island station data for SO₂ may reflect lower ambient concentration levels than at the project site as that station is in rural area that is somewhat removed from stationary and mobile emission sources. Staff believes that the Sacramento Del Paseo Manor monitoring station is more likely to be representative of this site for maximum SO₂ ambient concentrations. The Bakersfield station data for particulate sulfate may reflect somewhat higher ambient concentration levels than at the project site due to higher particulate levels in general and higher sulfur emissions in the southern part of the San Joaquin Valley. For the analysis, the maximum criteria pollutant concentration from the three most recent years of reported data (1997-1999) was used for each limit as the background value. These values, as well as the most restrictive AAQS are shown in **AIR QUALITY Table 3**.

AIR QUALITY: Table 3
Ambient Air Quality Monitoring Data for WGS2 (ppm)

Pollutant	Averaging Time	1997	1998	1999	Most Restrictive Ambient Air Quality Standard
Ozone (a)	1 hour	0.115	0.134	0.119	0.09
	Number of days exceeding State Standard (0.09ppm)	5	24	13	
	Number of days exceeding Federal Standard (0.12ppm)	0	3	0	
	8 hour	0.091	0.119	0.104	0.08
	Number of days exceeding Federal Standard (0.08ppm)	2	13	7	
PM ₁₀ (µg/m ³) (b)	24 hour	119	125	132	50
	Number of days exceeding State Standard (50 µg/m ³)	42	45	84	
	Annual Geometric Mean	32.3	DI	33.6	30
	Annual Arithmetic Mean	32.3	DI	40.9	50
NO ₂ (a)	1 hour	0.093	0.088	0.103	0.25
	Annual	0.021	DI	0.022	0.053
CO (a)	1 hour	7.1	9.4	11.4	20
	8 hour	4.99	7.34	6.36	9
SO ₂ (c)	1 hour	0.015	0.028	0.029	0.25
	3 hour (e)	0.014	0.025	0.026	0.5
	24 hour	0.006	0.018	0.014	0.04
	Annual	0.002	0.003	0.004	0.03
Particulate Sulfate (d) (ug/m ³)	24 hour	5.6	ND	ND	

Source: CARB 2001

(a) From Modesto 14th Street station

- (b) Highest concentration from either Modesto 14th Street or I Street stations. Number of day exceeding standard is the calculated value rather than the measured value and for 1998 includes data from both stations.
- (c) Sacramento Del Paseo Manor station
- (d) Bakersfield station
- (e) Three hour data calculated as 0.9 times the maximum one hour value.
- ND No Data. Particulate Sulfate Monitoring in the San Joaquin Valley was discontinued after 1997.
- DI Data incomplete, annual average/mean data could not be calculated or were not representative.

PROJECT DESCRIPTION

This section describes the project design and criteria pollutant control devices as described in the SPPE application (MID 2001a), and data request responses filed on June 15, 2001 (MID 2001b).

PROPOSED EQUIPMENT

The major equipment proposed in the application include the following (MID 2001a):

- One General Electric (GE) LM6000 SPRINT combustion turbine generator (CTG), with a nominal gross output of 47 MW, equipped with water injection and inlet air chilling.
- One heat recovery steam generator (HRSG), which will be either a drum-type or once-through steam generator system. Both units are designed with a high pressure steam (1,250 psig, 950°F) capacity of 270,000 lbs/hr, and a low pressure steam (100 psig, 600°F) capacity of 12,000 lbs/hr. The HRSG is equipped with:
 - i. a duct burner with a firing capacity of up to 235 MMBtu/hr (high heating value[HHV]-basis);
 - ii. a selective catalytic reduction (SCR) emission control system that will use ammonia vapor in the presence of a catalyst to reduce NO_x emissions;
 - iii. a precious metals based oxidation catalyst unit to reduce CO and VOC emissions.
- A single condensing steam turbine generator (STG), rated at approximately 37 MW gross.
- A cooling system consisting of a surface condenser and a three-cell mechanical draft cooling tower with high efficiency drift eliminator and a circulation water flow capacity of 27,000 gallons per minute. The cooling tower will operate 8,760 hours/year.
- A continuous emission monitoring (CEM) system.

FACILITY OPERATION

The combustion turbine generator (CTG), rated at 47 MW, will exhaust into a HRSG. The HRSG will be either a drum-type or once-through design with duct firing which provides steam to the steam turbine. A maximum of 37 MW will be produced by the steam turbine. The maximum net output of WGS2 is approximately 80 MW, while the net plant output operating under full load no duct firing conditions would be 57.7 MW at

annual average conditions. The project is expected to operate as a load following unit that will range from 20 MW to 80 MW output.

The HRSG will provide for the transfer of heat from the exhaust gases of the CTG to the HRSG feedwater, which will become steam. The proposed HRSG (either type) will be equipped with a duct burner, a selective catalytic reduction (SCR) system, and an oxidation catalyst. The HRSG duct burner will provide the capability to increase steam turbine output from 13 MW to 37 MW. The combustion turbine and duct burner will burn only natural gas.

A three-cell mechanical-draft cooling tower will provide approximately 27,000 gallons per minute (gpm) of circulating cooling water to condense the turbine exhaust steam at maximum plant load. The Applicant estimates a total dissolved solids (TDS) concentration of 2,500 ppm in the cooling tower water. PM₁₀ emissions will be generated from the TDS in the water that is emitted as drift from the cooling tower.

EMISSION CONTROLS

The exclusive use of pipeline-quality natural gas, a relatively clean-burning fuel, will limit the formation of VOC, PM₁₀, and SO₂ emissions. Natural gas contains very little noncombustible gas or solid residues and a small amount of reduced sulfur compounds including mercaptan, thus resulting in relatively low emissions of the above-mentioned pollutants.

The combustion turbine generator (CTG) will employ an inlet air chiller and water injection for maximum efficiency on hot days. The HRSG duct burner will be natural gas-fired. After the duct burner, the flue gases pass through the HRSG catalyst systems to reduce NO_x, CO, and VOC emissions. An SCR system that will use ammonia vapor in the presence of a catalyst will reduce NO_x concentrations to 2.5 ppmvd (@ 15 percent O₂) in the HRSG exhaust gas. An oxidation catalyst will reduce CO and VOC concentrations to no more than 6.0 ppmvd and 2.0 ppmvd, respectively (@ 15 percent O₂). Additionally, continuous emission monitors (CEMs) are proposed to be installed on the HRSG exhaust stack to monitor NO_x, CO, and O₂ concentrations, and stack exhaust flow to assure adherence with the proposed CTG/HRSG emission limits.

The cooling tower will be equipped with a high efficiency drift eliminator to control PM₁₀ emissions. The drift eliminator will control the drift fraction to 0.0005 percent.

ESTIMATED PROJECT EMISSIONS

The proposed project will generate air emissions during the construction and operation of the facility. The following is a summary of the air emissions from these sources:

CRITERIA POLLUTANTS GENERATED FROM CONSTRUCTION ACTIVITIES

The WGS2 will include an 80 MW natural gas-fired, combined-cycle power plant with an upgraded onsite 69 kilovolt (kV) switchyard and the following linear and ancillary facilities:

- A new 1.2-mile long 69 kV transmission line that will interconnect with the existing Enslin Substation.

- The existing Woodland 1 natural gas supply pipeline will be used. However, construction of a 3-mile 16-inch diameter and a 3-mile 12-inch diameter natural gas pipeline will be required to augment existing PG&E pipelines northwest of the site.
- A new 0.9 mile 10-inch water pipeline from an existing main of the Modesto Regional Water Treatment Plant will serve the site's water needs.
- Industrial and domestic wastewater from the plant will be transported via an existing city sanitary sewer connection.
- An existing aqueous ammonia storage tank will be used to store ammonia for use in the SCR process.

The proposed construction schedule will extend over approximately 20 months, based on a 9 hours per day, five days a week schedule. Construction of the power plant is planned to take about 17 months of active construction and is scheduled to occur between November 1, 2001 and July 1, 2003. Construction of the transmission line is planned to take about 8 weeks of active construction and is scheduled to occur between February 1 and May 31, 2002. Construction of the water pipeline is planned to take about 4 weeks of active construction and is scheduled to occur between January 1 and April 13, 2002. Construction of the natural gas line is scheduled to occur between May 1 and August 31, 2002.

During the construction period, air emissions will be generated from the exhaust of the heavy equipment such as bulldozers, excavators, cranes, compressors, paving equipments, and from fugitive dust generated from activities such as clearing, grading and preparation of the site. **AIR QUALITY Table 4** summarizes the different levels of criteria pollutants that will be generated from the construction activities at the WGS2 site and the new gas and water pipelines.

AIR QUALITY: Table 4
Estimated Construction Emissions from the WGS2 Project^a
(Maximum Daily Emissions lbs/day)

	NO_x	CO	PM₁₀	SO_x	VOC
WGS2 Power Plant Facility	87.49	261.72	17.28	2.13	23.75
Pipeline Construction ^b	74.4	29.5	8.3	2.7	5.8

^a Includes onsite emissions and offsite construction and worker traffic emissions.

^b Maximum monthly for the sequential water and natural gas pipeline construction.

The emissions from the 1.2 miles of transmission line construction were considered to be negligible and were not estimated by the Applicant. The transmission line construction includes the installation of 35 new 60-foot poles, removing existing poles, and stringing conductors to the poles along the 1.2-mile transmission route. The transmission line construction is estimated to take 35 days to complete.

The equipment and fugitive dust emissions provided above were based on available regulatory agency emission factor calculation and dust emission control efficiency

documents, such as USEPA's AP-42, and the estimated number of operational hours for each piece of equipment throughout project construction.

Energy Commission staff believes that all reasonable measures should be required to reduce the air emission impacts resulting from construction. Energy Commission staff recommended construction emission mitigation measures are listed in the project mitigation section.

CRITERIA POLLUTANTS GENERATED FROM PROJECT OPERATION

Air emissions will be generated from operating the major project components. **AIR QUALITY Tables 5 and 6** summarize the maximum (worst case) estimated levels of the different criteria pollutants associated with project operation. The assumptions used in calculating the air emissions in the table include:

- Manufacturer guaranteed emission factors,
- The facility operating 24 hours per day, 8,760 hours per year,
- Turbine/HRSG maximum annual emissions based on the turbine operating at 100 percent load, with maximum duct firing, and a temperature of 40°F, and:
 - a. For NO_x and CO emissions: ~182 cold starts (365 hours, total),
 - b. For VOC, PM₁₀, and SO₂ emissions: will be highest in case of nonstop turbine operation throughout the year,
- Turbine/HRSG maximum daily emissions based on the turbine operating at 100 percent load, with maximum duct firing, and a temperature of 40°F, and:
 - a. For NO_x and CO emissions: 1 cold start with a duration of 2 hours.
 - b. VOC, PM₁₀, and SO₂ emissions: will be highest in case of nonstop turbine operation.
- The cooling tower operating 24 hours per day, 8,760 hours per year.

The proposed project's hourly emissions of criteria air pollutants are shown in **AIR QUALITY Table 5**. This table presents emissions from the combustion turbine/ HRSG and cooling tower. As this table shows, the highest emissions are from the combustion turbine, with the NO_x and CO emissions being significantly higher during cold startup. These higher emissions occur because the turbine is designed for maximum efficiency during full load steady state operation.

Air Quality: Table 5
Project (per CTG) Hourly Emissions (pounds per hour, lb/hr)

Operational Profile		NO _x	CO	PM ₁₀	SO ₂	VOC
CTG Cold Start-up (120 minutes)	Lb/hr	24.6	40.8	*	*	*
	Lb/event	49.2	81.6	*	*	*
CTG Steady State @100% load, Duct Firing, at 40°F		6.35	9.27	3.0	0.49	1.77
CTG Steady State @100% load, Duct Firing, at 67°F		6.27	9.16	3.0	0.48	1.74
CTG Steady State @100% load, Duct Firing, at 102°F		6.27	9.16	3.0	0.48	1.74

CTG Steady State @100% load, No Duct Firing, at 40°F	4.22	6.17	2.5	0.32	1.18
CTG Steady State @100% load, No Duct Firing, at 67°F	4.15	6.06	2.5	0.32	1.15
CTG Steady State @100% load, No Duct Firing, at 102°F	4.15	6.06	2.5	0.32	1.15
CTG Steady State @Minimum load at 40°F	1.91	2.79	2.5	0.15	0.53
CTG Steady State @Minimum load at 102°F	1.91	2.79	2.5	0.15	0.53
Cooling Tower	--	--	0.17	--	--

* Emissions of VOC, PM₁₀ and SO₂ are a function of quantity of fuel burned, thus they will be highest when the turbine operates nonstop throughout the year.

AIR QUALITY Table 6 summarizes the maximum (worst case) daily and annual estimated criteria pollutants emissions from the project, using the assumptions provided above. Turbine annual emissions are estimated based on the 100 percent load, duct fired at 40°F operating mode, including startup and shutdown (as assumed in project description section) emissions.

AIR QUALITY: Table 6
Estimated Maximum Emissions from the WGS2 Project

Pollutant	NO _x	CO	PM ₁₀	SO _x	VOC
Project Total Daily Emissions (Lb/day)	188.8	285.6	76.0	11.7	42.5
Project Total Annual Emissions (Ton/year)	29.2 (a)	46.4	13.9	2.1	7.8

(a) Annual NO_x will be limited to 29.2 tons/year by permit condition. Maximum potential to emit is calculated to be 31.1 tons/year.

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
AIR QUALITY – Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?			X	
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X		
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?		X		

d. Expose sensitive receptors to substantial pollutant concentrations?		X		
e. Create objectionable odors affecting a substantial number of people?			X	

DISCUSSION OF IMPACTS

A. Conflict with Air Quality Plan: Less Than Significant Impact

The proposed project is located in Stanislaus and San Joaquin Counties, and is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (District). The SJVAB is designated as non-attainment for both federal and state ozone and PM₁₀ standards. Ozone is classified by federal and state standards as serious non-attainment and severe non-attainment, respectively. PM₁₀ is designated as serious non-attainment and non-attainment by federal and state, respectively. The attainment status for all other criteria pollutants is considered to be in attainment by the state, and unclassified by federal standards due to lack of sufficient monitoring data.

The District is the lead agency for air quality planning and regulation for San Joaquin Valley Air Basin (SJVAB). It is responsible for developing that portion of the State Implementation Plan (SIP) that deals with certain stationary and area source controls and, in cooperation with the transportation planning agencies (TPAs), the development of transportation control measures (TCMs). The California Air Resources Board (CARB) is responsible for submitting a SIP to USEPA.

OZONE

The Federal Clean Air Act Amendments (FCAAA) require that areas classified as “moderate” non-attainment and above to show “reasonable further progress” towards attainment. Reasonable further progress is defined as achieving 15% from the 1990 baseline inventory for VOC emissions by 1996, and an average of 3% per year reduction each year thereafter until attainment is reached. The substitution of NO_x emission reduction for VOC emission reductions is permitted. These target emission level reductions are referred to as “milestones.”

To demonstrate that the milestones are being achieved, USEPA required districts to prepare rate of progress plans. In the post-1996 rate of progress report (ROP) for the 1999 milestone, the District demonstrated that the 9% reduction would be met through 4.5% each VOC and NO_x emission reductions. This required state and District measures to reduce VOC emissions by 22.7 tons per day (tpd) and NO_x emissions by 31.44 tpd within the SJVAB. The District, State and applicable Federal measures have achieved 20.14 tpd VOC emission reductions and 57.97 tpd NO_x emission reductions. Although VOC emission reductions were short, the NO_x emission reductions were more than adequate to cover the shortfall.

Planned versus actual NO_x emission reductions (in tons per day, tpd), associated with the applicable District rules for the WGS2 project are:

Rule No	Rule Name	1994 projected Reduction (All Sources)	Total 1994 SIP Currency Reduction	1994 SIP Currency Reduction (SIP Creditable)
4703	Stationary Gas Turbine	11.92	11.73	8.86

The WGS2 will use Best Available Control Technology to control the project's emissions, in addition, the operational emissions of pollutants will be fully mitigated by the emissions offset credits (ERCs) obtained by the Applicant. Therefore, this project will not conflict or obstruct the implementation of the ozone rate of progress plan.

PM₁₀

As stated above, the project area is designated as "serious" non-attainment area for PM₁₀ by USEPA. The SJVAB does not meet the 24-hour and annual PM₁₀ standards and is required to reach attainment for both standards by December 31, 2001. If attainment by that date cannot be achieved, a one-time 5-year extension may be granted by the USEPA. The extension would make the attainment date no later than December 31, 2006. The District's PM₁₀ Attainment Demonstration Plan (ADP) was prepared in 1997. The CARB approved the District's PM₁₀ ADP for submittal as a revision to the SIP. The District's planning and regulatory efforts in the stationary and area source category include fugitive dust, smoke management, and stationary NO_x sources (PM₁₀ precursor).

The major proposed action areas in the ADP include amending Regulation VIII rules (Rules 8020, 8030, 8040, 8060, and 8070), from Reasonably Available Control Measures (RACM) to Best Available Control Measures (BACM), and increase its surveillance efforts to ensure compliance. The amendments to Regulation VIII will be fully implemented by 2001. These amendments are planned based on the USEPA's concerns about the inadequacy of findings for the emission budgets contained in the PM₁₀ ADP.

The WGS2 will use Best Available Control Technology to control the project's emissions; in addition, the operational emissions of NO_x, VOC, and PM₁₀ will be fully mitigated by the ERCs obtained by the Applicant. Therefore, the operation of the WGS2 will not conflict or obstruct the implementation of the PM₁₀ ADP.

However, based on the above discussion, the construction emissions of the project will need to be further mitigated to comply with the implementation of the ADP for PM₁₀. The staff proposed mitigation measures for construction emissions are stated in the mitigation section of this Initial Study.

For this project, construction emissions and operating emissions were modeled, and the results of the modeling analysis were compared to ambient air quality standards.

B. Violate Air Quality Standard or Contribute to Violation: Less Than Significant With Mitigation Incorporated

CONSTRUCTION IMPACTS

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

Applicant Construction Impact Analysis

The applicant modeled the emissions for the on-site construction activities. This analysis was completed using the ISCST3 (Version 00101) model. A simplified approach of project site wide area sources for construction equipment emissions and fugitive dust modeling was employed. The emissions were modeled using a 7 a.m. to 4 p.m. work schedule. **AIR QUALITY Table 7** provides the results of this modeling analysis.

As can be seen from the modeling results provided in Table 7, the modeled construction PM₁₀ impacts significantly exceed the ambient air quality standards and are therefore significant. Energy Commission has suggested additional mitigation measures to reduce these impacts to the greatest feasible extent.

AIR QUALITY: Table 7
WGS2 Project Ambient Air Quality Impact
Applicant Construction ISC Modeling Results

Pollutant	Averaging Period	Project Impact (µg/m ³)	Background (µg/m ³)	Total Impact (µg/m ³)	Limiting Standard (µg/m ³)	Type of Standard	Percent of Standard
NO ₂	1-Hour	252 ^a	194	446	470	CAAQS	95
	Annual	5.96 ^b	41	47	100	NAAQS	47
PM ₁₀	24-Hour	89.6	132	222	50	CAAQS	443
	Annual ^c	4.93	33.6	38.5	30	CAAQS	128
	Annual ^d	4.93	40.9	45.8	50	NAAQS	92
CO	1-Hour	647	13,029	13,676	23,000	CAAQS	59
	8-Hour	129	7,269	7,398	10,000	CAAQS	74
SO ₂	1-Hour	66.4	75.5	142	655	CAAQS	22
	3-Hour	59.8 ^e	67.6	127.4	1300	NAAQS	10
	24-Hour	6.08	46.8	52.9	105	CAAQS	50
	Annual	0.34	10.4	10.7	80	NAAQS	13

^a Results based on ozone limiting method (OLM) applied with maximum ambient ozone concentration of 287.5 (µg/m³)

^b Results based on ambient ratio method (ARM) using default ratio of 0.75.

^c Annual geometric mean.

^d Annual arithmetic mean.

^e The 3-hour SO₂ concentration has been assumed to be 0.9 fraction of the 1-hour concentration.

Staff Modeling Analysis

The Applicant's construction modeling results showed relatively high PM₁₀ concentrations. Staff performed a separate modeling analysis to confirm the Applicant's modeled PM₁₀ concentrations. The following modifications were made to refine the construction emissions modeling analysis:

- The PM₁₀ hourly emissions were modeled based on the 8 a.m. to 5 p.m. construction schedule.

- The construction PM₁₀ emissions were modeled as a series of volume sources rather than a single area source. A total of 30 volume sources, evenly spaced over the area of emissions indicated by the Applicant, were modeled.

These adjustments were performed to provide a more realistic modeling approach to determine the maximum near field construction impacts. It should be noted that these modifications, while they eliminate certain conservative modeling assumptions/methods, retain many other conservative modeling assumptions that will still overestimate the near field concentrations.

AIR QUALITY Table 7a provides the results of the staff modeling analysis. As can be seen from the modeling results provided in Table 7a, the estimated construction impacts from the staff modeling analysis, are lower than those provided in the Applicant's modeling results. The staff modeling results indicate lower annual PM₁₀ impacts.

AIR QUALITY: Table 7a
WGS2 Park Project Ambient Air Quality Impact
Staff Construction ISCST3 PM₁₀ Modeling Results

Pollutant	Averaging Period	Project Impact (µg/m ³)	Background (µg/m ³)	Total Impact (µg/m ³)	Limiting Standard (µg/m ³)	Type of Standard	Percent of Standard
PM ₁₀	24-Hour	33.5	132	222	50	CAAQS	443
	Annual ^a	2.34	33.6	35.9	30	CAAQS	120
	Annual ^b	2.34	40.9	43.4	50	NAAQS	87

^a Annual geometric mean.

^b Annual arithmetic mean.

The modeling results provided above are conservative, as they do not include the proposed heavy equipment emission mitigation measures. Additionally, the maximum PM₁₀ construction impacts occur at the property fence line and decrease significantly with distance. At a distance of 500 meters, the modeled 24-hour PM₁₀ concentrations are modeled to be approximately 1/30th the maximum modeled concentration provided in Table 7a.

The PM₁₀ construction emissions will be further mitigated by the ERCs that the Applicant will have acquired prior to construction.

Staff believes that with the inclusion of the construction mitigation measures listed below, the short-term construction impacts will not be significant.

CONSTRUCTION MITIGATION

Applicant's Proposed Mitigation

The Applicant has proposed (MID 2001a, Appendix 8.1-4) to perform the following construction emission mitigation.

For diesel heavy equipment exhaust emissions:

- Operational measures, such as limiting engine idling time and shutting down equipment when not in use;
- Regular preventative maintenance to prevent emission increases due to engine problems;
- Use of low sulfur and low aromatic fuel meeting California standards for motor vehicle diesel fuel; and
- Use of low-emitting diesel engines meeting federal emissions standards for construction equipment if available.

For fugitive dust emissions during construction:

- Use either water application or chemical dust suppressant application to control dust emissions from unpaved surface travel and unpaved parking areas;
- Use vacuum sweeping and/or water flushing of paved road surface to remove buildup of loose material to control dust emission from travel on the paved access road (including adjacent public streets impacted by construction activities) and paved parking areas;
- Cover all trucks hauling soil, sand, and other loose materials, or require all truck to maintain at least two feet of freeboard;
- Limit traffic speeds on unpaved surfaces to 25 mph;
- Install sandbags or other erosion control measures to prevent silt runoff to roadways;
- Re-plant vegetation in disturbed areas as quickly as possible;
- As needed, use gravel pads along with wheel washers or wash tires of all trucks exiting the construction site that carry track-out dirt from unpaved surfaces; and
- Mitigate fugitive dust emissions from wind erosion of areas disturbed from construction activities (including storage piles) by application of either water or chemical dust suppressant and/or use of wind breaks.

The fugitive dust mitigation plan requirements are detailed in Condition of Exemption AQ-C1.

Staff Proposed Mitigation

Since the modeled short-term construction impacts of PM_{10} are significant, staff recommends additional construction equipment emission mitigation measures as part of the project's Conditions of Exemption to mitigate impacts caused by the emission of this pollutant.

For PM_{10} construction vehicle emissions mitigation, as provided in Condition of Exemption AQ-C2, staff recommends additional engine emission mitigation that may include feasible the use of oxidizing soot filters, oxidizing catalysts, diesel fuel certified to CARB low sulfur fuel standards (sulfur content less than 15 ppm) and diesel engines that are either equipped with high pressure fuel injection, employ fuel injection timing

retardation or are certified to USEPA and CARB 1996 or better off-road equipment emission standards. Additionally, idle time, to the extent practical, shall be restricted to no more than 5 minutes. These technologies have operational constraints and the recommended Condition of Exemption AQ-C2 is written to give the project owner the latitude to remove the oxidizing soot filters when it is determined that they are not appropriate for the specific application.

OPERATION IMPACTS

The following section discusses the project's direct ambient air quality impacts, as estimated by the Applicant, and direct and cumulative ambient air quality impacts separately estimated by Energy Commission staff. It should be noted that all WGS2 impact analyses were based on the emissions shown in **AIR QUALITY: Table 5**. When the District issues its Authority to Construct, the WGS2 permit emission levels must be no greater than the emissions presented in this analysis in order for the impact assessment presented herein to remain valid.

DIRECT IMPACTS

Applicant Impact Analysis

An impact screening modeling analysis was performed for 16 different turbine/HRSG design and operating scenarios. The scenarios evaluated included combinations of drum-type or once-through steam generator (OTSG) HRSG designs, 100% load with duct burners on, 100% load with duct burners off, and minimum load (30% turbine load) at three different ambient conditions (40°F and 90% RH, 67°F and 60% RH, and 102°F and 20% RH). The cooling tower was included in the refined modeling analysis at its maximum water recirculation rate and was not evaluated in this screening modeling assessment.

The USEPA approved ISCST3 (Version 00101) model was used to screen the potential ambient air quality impacts of these 16 different scenarios. The ISC model is a steady-state Gaussian plume model, appropriate for regulatory use, that can be used to assess pollution concentrations from a wide variety of sources associated with an industrial source complex. One year (1976) of hourly meteorological data collected at the Stockton meteorological station monitor, with concurrent mixing height data, was used in the modeling analysis. This meteorological data was recommended for use by and obtained from District. Based on the screening modeling analysis, the following operational modes were found to have the highest impact potential:

- Maximum NO_x, CO, and SO₂ impacts, other than 3 hour SO₂ impacts, occurred during the low temperature (40°F) full turbine load and duct firing case for the drum-type HRSG.
- Maximum PM₁₀ impacts occurred during the high temperature (102°F) minimum turbine load case for the drum-type HRSG.
- Maximum 3 hour SO₂ impacts occurred during the annual average temperature (67°F) full turbine load and duct firing case for the drum-type HRSG.

A more refined modeling analysis was performed to evaluate and quantify the project ambient air quality impacts. The ISCST3 model was used for the refined modeling analysis. For this refined modeling analysis, the applicant conducted a Good Engineering Practice (GEP) stack height analysis, using the height of the HRSG building as the controlling structure for the GEP stack height determination. Since the design heights of the stacks for the two HRSG designs and the cooling tower were less than 2.5 times the HRSG building height, downwash effects were modeled for the facility using the ISCST3 model. In addition to the turbine HRSG, the refined modeling analysis conducted by the Applicant included the cooling tower emissions. The predicted maximum hourly concentrations of the nonreactive pollutants are summarized in **AIR QUALITY Table 8**.

AIR QUALITY: Table 8
WGS2 Ambient Air Quality Impact
Applicant Operations ISC Modeling Results

Pollutant	Averaging Period	Project Impact ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Impact ($\mu\text{g}/\text{m}^3$)	Limiting Standard ($\mu\text{g}/\text{m}^3$)	Type of Standard	Percent of Standard
NO ₂	1-Hour	30.1	194	224	470	CAAQS	48
	Annual	2.02	41	43	100	NAAQS	43
PM ₁₀	24-Hour	4.85	132	137	50	CAAQS	274
	Annual ^a	1.10	33.6	34.6	30	CAAQS	115
	Annual ^b	1.10	40.9	42.0	50	NAAQS	84
CO	1-Hour	44.0	13,029	13,073	23,000	CAAQS	57
	8-Hour	44.1	7,269	7,313	10,000	CAAQS	73
SO ₂	1-Hour	2.32	75.5	77.8	655	CAAQS	12
	3-Hour	2.06	67.6 ^c	69.7	1300	NAAQS	5
	24-Hour	0.26	46.8	47.1	105	CAAQS	45
	Annual	0.15	10.4	10.6	80	NAAQS	13

^a Annual geometric mean.

^b Annual arithmetic mean.

^c The 3-hour SO₂ background concentration has been assumed to be 0.9 fraction of the 1-hour concentration.

The Applicant's modeling results indicate that the project's operational impacts would not create violations of NO₂, SO₂, or CO standards and thus do not create a significant impact. However, the modeling also shows that the PM₁₀ impacts could further exacerbate violations of the PM₁₀ standards. Therefore, staff concludes that the project's PM₁₀ ambient air quality impacts are significant and must be adequately mitigated. The District evaluates the significance of the modeled PM₁₀ impacts based on the federal significance levels provided in 40 CFR 51.165 (b)(2). The PM₁₀ 24-hour and annual significance criteria under this regulation are 5 and 1 $\mu\text{g}/\text{m}^3$, respectively. Since the WGS2 project modeled PM₁₀ annual impact concentrations are above 1 $\mu\text{g}/\text{m}^3$, the PM₁₀ emissions may be considered significant by the District and annual emissions reductions or operating restrictions may be necessary to show impacts below 1 $\mu\text{g}/\text{m}^3$.

There is the potential that higher short-term concentrations may occur during fumigation conditions that are caused by the rapid mixing of the plume to ground level.

However, the available fumigation modeling methods only apply to rural areas. The project site is an urban area; therefore, no approved fumigation modeling techniques are available for this project. Based on experience with other similar sized projects that were located in rural areas, staff does not believe that short-term fumigation will result in significant impacts at this site.

Additionally, there is the potential for higher short-term NO₂ and CO concentrations during start-up or initial commissioning. The Applicant modeled the start-up/commissioning period emissions and determined that no violations of the short-term NO₂ or CO standards would occur. A summary of the Applicant's modeling results are provided in **AIR QUALITY Table 9**.

AIR QUALITY: Table 9
WGS2 Ambient Air Quality Impact
Applicant Start-up/Initial Commissioning ISC Modeling Results

Pollutant	Averaging Period	Project Impact (µg/m ³)	Background (µg/m ³)	Total Impact (µg/m ³)	Limiting Standard (µg/m ³)	Type of Standard	Percent of Standard
NO ₂ Start-up	1-Hour	150	194	344	470	CAAQS	73
NO ₂ Commissioning	1-Hour	243	194	437	470	CAAQS	93
CO Start-up or Commissioning	1-Hour	248	13,029	13,277	23,000	CAAQS	58
	8-Hour	168	7,269	7,437	10,000	CAAQS	74

OPERATIONS MITIGATION

Applicant's Proposed Mitigation

As discussed in the project description section, the Applicant will apply air pollution control equipment to limit the project's emission levels. To reduce NO_x emissions, the Applicant proposes to use water injection in the CTG. In addition, the HRSG will be equipped with an aqueous ammonia injection grid and a SCR system to further reduce NO_x emissions. To reduce CO and VOC emissions, the Applicant proposes to use a combination of good engineering and maintenance practices, along with an oxidizing catalyst located in the HRSG. The use of natural gas, will limit the project's SO₂ and PM₁₀ emissions. The use of drift eliminators on the cooling tower will reduce particulate matter originating from TDS in the circulating water. The Applicant intends to use drift eliminators with a design efficiency of 0.0005 percent, which is considered a high level of efficiency for cooling towers.

Based on the discussions of the project's CO emissions in the impact section, staff believes that the project will not further contribute to violations of the ambient CO air quality standards.

On the other hand, the project's direct and cumulative impact analyses, as summarized in **AIR QUALITY Table 8**, show that the project could further worsen PM₁₀ standard violations in the San Joaquin Valley region. CARB and the District have found that NO_x and VOC emissions are precursors to ozone formation and that NO_x, SO₂, and VOC emissions can form secondary PM₁₀. Therefore, since ozone and PM₁₀ ambient air quality standards are regularly violated within San Joaquin Valley, Energy Commission staff believes that any increase in emissions of precursors to those pollutants (NO_x, PM₁₀ and VOC) may contribute to such violations and thus are a significant impact, and so must be mitigated on a 1:1 basis.

The following available offset credits from various sources, are proposed by the Applicant.

Project Mitigation and Offsets

To fully mitigate the maximum project emissions, offsets (mitigation) equal to the maximum project emissions are required for NO_x, PM₁₀, and VOC. District Rule 2102, Section 4.2 requires that the Applicant provide emission offsets, in the form of banked ERCs, for the project's emissions of NO_x, PM₁₀, and VOC.

The Applicant is proposing several sources of existing ERCs to fully mitigate the project's potential emissions (MID 2001a, pg 8.1-44, Appendix 8.1-6). All air pollutant offsets provided for the project are estimated on a quarterly basis from the different determined operating sources. The District is just beginning its review of the MID permit application and the Applicant's proposed offset package is not yet approved. Additionally, the Applicant has requested that the proposed source of the NO_x and VOC offsets be kept confidential until final agreements have been made. Additional detail regarding the final proposed offset balances and ERC sources will be provided in the Final Initial Study.

Calculations of the required ERCs are based on the distance of the project from different sources of offsets. The District requires a 1:1 offsetting ratio for on-site sources, a 1.2:1 offsetting ratio for the sources within 15 miles radius and a 1.5:1 offsetting ratio for the sources located farther than 15 miles from the project site. **AIR QUALITY Table 10** provides a summary of the Applicant's offset emission liability and offset package proposal.

AIR QUALITY: Table 10
WGS2 Proposed Offset Package Summary

	NO_x	VOC	PM₁₀
Project Emission Liability (tons/year)	29.17	7.8	13.1
ERCs at 1.2:1 Ratio (tons)	35.0	9.4	--
Interpollutant Offsets: SO ₂ for PM ₁₀ ERCs 2:5 to 1 Ratio (tons)	--	--	32.8
Source of offsets	Existing ERC Certificates	Existing ERC Certificates	Existing ERC Certificates

The applicant has identified that they are in the process of finalizing agreements for the NO_x and VOC ERCs. The information submitted by the Applicant under confidential cover indicates that the sources of these ERCs are within 15 miles of the proposed project site and therefore the ERCs can be applied at a 1.2:1 ratio to offset the NO_x and VOC emissions.

The Applicant is proposing to use SO₂ ERCs to offset PM₁₀ project emissions at a 2.5 to 1 ratio. SO₂ is a precursor to secondary PM₁₀ (i.e. sulfite/sulfate formation); therefore, SO₂ ERCs are used to offset PM₁₀ in the same manner as VOC and NO₂ ERCs are required as ozone (O₃) precursors. Using SO₂ ERCs to offset PM₁₀ emissions conforms with the current requirements of Rule 2201 (District 2001). Upon the final determination of the appropriate interpollutant offset ratio, it may be necessary for the Applicant to obtain additional SO₂ or PM₁₀ credits.

SO₂ ERCs have been acquired from J.R. Simplot Company and are from a site located in Lathrop which is located within 20 miles of the project site. While not required by District regulation, the use of the SO₂ ERCs also serves to directly offset the SO₂ emissions from the project.

Staff Proposed Mitigation

Neither USEPA nor CARB have reviewed the validity of the proposed offset package and the District has not completed its review of the project. Assuming that these agencies determine that the proposed ERCs are valid to offset the WGS2 emission impacts, staff proposes to find that with the Applicant's proposed emission controls and ERCs, there is no further mitigation necessary for the WGS2 operating emission impacts.

C. Result in Considerable Increase in Criteria Pollutant in Non-Attainment Status: Less Than Significant With Mitigation Incorporated

As described in the mitigation section, the project emissions, with the exception of CO, will be fully offset to ensure a net air quality benefit with the SJVAB. Additionally, a cumulative modeling analysis was performed. This modeling analysis identifies whether the project, along with other identified air pollution sources known to be under development in the project area, would create a cumulative air quality impact.

CUMULATIVE IMPACTS MODELING ANALYSIS

Stationary sources located within six miles of the WGS2 site that meet the following criteria will be used to identify other emission sources that may cause cumulative impacts:

- (a) Have received an Authority to Construct (ATC) permit but are not yet operational; or
- (b) Have submitted complete ATC applications to the District.

Staff has not yet received the list of potential cumulative emission sources that is being prepared by the District. The cumulative analysis will be performed by the Applicant once the sources have been evaluated and pertinent emission and modeling data

have been identified. The results of the cumulative analysis will be provided in the Final Initial Study.

Applicant's Proposed Mitigation

See the mitigation description under impact issue "b" above.

Staff Proposed Mitigation

See the mitigation description under impact issue "b" above.

D. Expose Sensitive Receptors to Substantial Pollutant Concentrations: Less Than Significant With Mitigation Incorporated

EXISTING RESIDENTIAL AND SENSITIVE RECEPTORS

POWER PLANT SITE

There are approximately 261,000 residents located within 6 miles of the WGS2 site. However, the nearest residences are located slightly more than ¼ mile to the east northeast of the site. The nearest locations with sensitive receptors (such as children and the elderly) are located more than ½ mile from the site, meaning that the exposures would not involve sensitive individuals at higher rates than the general population.

Also, as described in the Socioeconomics analysis, there is one census tract approximately two miles south of the proposed WGS2 site that contains a minority and low-income community that meets the environmental justice criteria. However, because the proposed project would comply with all regulatory requirements with regard to air quality and assuming that the Applicant will comply with the Conditions of Exception listed below, no significant air quality impacts are anticipated. Therefore, the project will not have adverse impacts on this community, disproportionate or otherwise.

LINEAR FACILITIES

The linear facilities to be constructed as a result of this project are as follows:

- A 1.2-mile long 69 kV transmission line that will interconnect with the existing Enslin Substation.
- A total of 6.25 miles of new natural gas pipelines northwest of the site in and near the City of Ripon.
- A 0.9-mile 10-inch water pipeline from an existing main of the Modesto Regional Water Treatment Plant will serve the site's water needs.

There may be short-term adverse impacts at residences and sensitive receptor locations that are adjacent to these linear construction routes. However, the time frame for these construction impacts is very short at any one location and these impacts are not considered to be significant.

TEMPORARY CONSTRUCTION EMISSIONS

As described earlier under impact issue “b,” the proposed project would generate temporary emissions from constructing the WGS2 facility and the associated transmission lines and natural gas and water pipelines. As a result, residential land uses may experience short-term adverse air quality impacts. However, through the implementation of the suggested mitigation measures during construction, it is assumed that the project would not result in any significant air quality impacts.

OPERATION EMISSIONS

As described earlier under impact issue “b,” the proposed project would generate a substantial level of criteria pollutant emissions from operating the 80-megawatt (MW) natural gas-fired combined-cycle power plant. However, the emissions of NO_x, VOC, SO₂ and PM₁₀ would be completely offset through the purchase of ERCs. In addition to these emissions being offset, the closest sensitive receptor is located over one-half mile from the proposed site. As a result, staff concludes that the criteria pollutant emissions generated from this project would not cause any significant air quality impacts to sensitive receptors.

In addition, because the proposed project would comply with all regulatory requirements with regard to air quality and no significant air quality impacts are anticipated, the project will not have disproportionate adverse impacts on the identified minority and low-income community.

Applicant’s Proposed Mitigation

See the mitigation description under impact issue “b” above.

Staff Proposed Mitigation

See the mitigation description under impact issue “b” above.

E. Create Objectionable Odors: Less Than Significant Impact

No odor impact is anticipated, since the facilities’ gas turbine/HRSG SCR systems’ ammonia slip will be limited to 10 ppmvd at the exhaust, which is below most published ammonia odor threshold values. The ambient ammonia concentrations, after dispersion, will be under the odor thresholds. No other significant emissions of odorous compounds will result from the gas turbine/HRSG and cooling tower.

CUMULATIVE IMPACTS

The results of the cumulative impact analysis will be provided for the addendum. However, based on the preliminary information received, staff believes that it is likely that the WGS2, with the implementation of the measures contained in the Conditions of Exemptions specified below, will not, either alone or in combination with other identified projects in the area, cause or contribute to any new or existing violations of applicable ambient air quality standards.

CONCLUSIONS

The WGS2 project, with the implementation of the Conditions of Exemption, will be constructed and operated in compliance with all applicable laws, ordinances, regulations, and standards identified previously in this section. Staff, assuming the expected result of the cumulative impact analysis, concludes that the WGS2 project will not create any significant direct or indirect adverse air quality impacts. Based upon these findings staff recommends that the Commission approve the Small Power Plant Exemption with the following proposed Conditions of Exemption to be included in the Commission Decision.

PROPOSED CONDITIONS OF EXEMPTION

GENERAL CONDITIONS

AQ-G1 The project owner shall obtain all necessary Authority-to-Construct air quality permits from the District prior to commencing construction; and upon start-up of operations shall obtain, in a timely manner, Permits-to-Operate as required by the Authority-to-Construct permits and District regulations.

Verification: The project owner shall submit copies of the ATCs and PTOs to the CEC CPM upon receipt of those permits from the SJVUAPCD.

CONSTRUCTION CONDITIONS

AQ-C1 Prior to the commencement of project construction, the project owner shall prepare a construction Fugitive Dust Mitigation Plan that will specifically identify fugitive dust mitigation measures that will be employed for the construction of the WGS2 project and related facilities.

- a. The Construction Fugitive Dust Mitigation Plan shall specifically identify measures to limit fugitive dust emissions from construction of the project site, the transmission lines and the natural gas lines. Measures that shall be addressed include the following:
 - the identification of the employee parking area(s) and surface of the parking area(s);
 - the frequency of watering of unpaved roads and disturbed areas;
 - the application of chemical dust suppressants;
 - the stabilization of storage piles and disturbed areas;
 - the use of gravel in high traffic areas;
 - the use of paved access aprons;
 - the use of posted speed limit signs;

- the use of wheel washing areas prior to large trucks leaving the project site; and
 - the methods that will be used to clean tracked-out mud and dirt from the project site onto public roads.
- b. The following measures should be addressed for the transportation of the borrow fill material to the WGS2 project site and the transmission and natural gas line sites, if any, and the transportation of export soils and construction debris:
- the use of covers on the vehicles;
 - the wetting of the material; and
 - insuring appropriate freeboard of material in the vehicles.

Verification: At least sixty (60) days prior to the start of construction, or a lesser period of time mutually agreed to by the project owner and the Compliance Project Manager (CPM), the project owner shall provide the CPM with a copy of the Construction Fugitive Dust Mitigation Plan for approval.

AQ-C2 The project owner shall employ the following measures to mitigate, to the extent practical, construction related emission impacts from off-road, diesel-fired construction equipment. These measures include the use of oxidizing soot filters, oxidizing catalysts, diesel fuel certified to CARB low sulfur fuel standards (sulfur content less than 15 ppm), and diesel engines that are either equipped with high pressure fuel injection, employ fuel injection timing retardation, or are certified to USEPA and CARB 1996 or better off-road equipment emission standards. Additionally, the project owner shall restrict idle time, to the extent practical, to no more than 5 minutes.

The use of each mitigation measure is to be determined by a Qualified Environmental Professional (QEP) or a qualified independent California Licensed Mechanical Engineer (ME). The QEP or ME is to be approved by the CPM prior to the submission of any reports. The QEP or ME will determine the mitigation measures to be used within the following framework.

Construction Mitigation Framework

1. No measure or combination of measures shall be allowed to significantly delay the project construction or construction of related linear facilities nor shall they be allowed to cause significant damage to the construction equipment or cause a significant risk to on site workers or the public.
2. Engines certified to USEPA and CARB 1996 or better off-road equipment emission standards and CARB certified low sulfur diesel fuel maybe used in lieu of oxidizing soot filters and oxidizing catalysts.

The QEP or ME, in consultation with the California Air Resources Board (CARB), will submit the following reports to the CPM for approval:

- Construction Mitigation Plan
- Reports of Change and Mitigation Implementation
- Emergency Termination of Mitigation Reports, as necessary

Construction Mitigation Plan

The Construction Mitigation Plan shall be submitted to the CPM for approval prior to rough grading on the project site and will include:

1. A list of all diesel fuel burning, off-road, stationary or portable construction-related equipment to be used either on the project construction site or the construction sites of the related linear facilities.
2. All equipment listed under (1), shall be identified as either using engines certified to USEPA and CARB 1996 or better off-road equipment emission standards, using diesel engines that are equipped with high pressure fuel injection, or using diesel engines that employ fuel injection timing retardation.
3. The determination of the suitability of all equipment listed under (1) to work appropriately with an oxidizing catalyst shall be identified except as provided for in item 3 of the **Construction Mitigation Framework** above. If a piece of equipment is determined to be unsuitable for an oxidizing catalyst, the QEP or ME will provide an explanation as to the cause of this determination.
4. The determination of the suitability of all equipment listed under (1) to work appropriately with an oxidizing soot filter shall be identified except as provided for in item 3 of the **Construction Mitigation Framework** above. If a piece of equipment is determined to be unsuitable for an oxidizing-soot filter, the QEP or ME will provide an explanation as to the cause of this determination.
5. Maximum idle times shall be identified for all equipment listed under (1).
6. The sulfur content of all diesel fuel to be burned in any equipment listed under (1) shall be identified.

Report of Change and Mitigation Implementation

The QEP or ME shall submit a Report of Change and Mitigation Implementation for approval to the CPM following the initiation of construction activities which contains at a minimum the cause of any deviation from the Construction Mitigation Plan, and verification of the Construction Mitigation Plan measures that were implemented. Verification includes, but is not limited to, the following:

1. USEPA or CARB engine certifications for item 2 of the **Construction Mitigation Plan**.
2. A copy of the contract agreement requiring subcontractors to comply with the elements under item 2 of the **Construction Mitigation Plan**.
3. Confirmation of the installation of either oxidizing catalysts or oxidizing soot filters as identified in items 3 and 4 of the **Construction Mitigation Plan** or the cause preventing the identified installations.
4. A copy of the contract agreement requiring subcontractors to comply with the elements under item 5 of the **Construction Mitigation Plan**.
5. A copy of receipts of purchase of diesel fuel indicating the sulfur content as identified in item 6 of the **Construction Mitigation Plan**.

Emergency Termination of Mitigation Report

If a specific mitigation measure is determined to be detrimental to a piece of construction equipment or is determined to be causing significant delays in the construction schedule of the project or the associated linear facilities, the mitigation measure may be terminated immediately. However, notification must be sent to the CPM for approval containing an explanation for the cause of the termination. All such causes are restricted to one of the following justifications and must be identified in any Emergency Termination of Mitigation Report.

1. The measure is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or power output due to an excessive increase in back pressure.
2. The measure is causing or reasonably expected to cause significant damage to the construction equipment engine.
3. The measure is causing or reasonably expected to cause a significant risk to nearby workers or the public.
4. Any other seriously detrimental cause which has approval by the CPM prior to the change being implemented.

Verification: The project owner will submit to the CPM for approval the qualifications of the QEP or ME at least 45 days prior to the due date for the Construction Mitigation Plan. The project owner will submit the Construction Mitigation Plan to the CPM for approval 30 calendar days prior to rough grading on the project site. The project owner will submit the Report of Change and Mitigation Implementation to the CPM for approval no later than 10 working days following the use of the specific construction equipment on either the project site or the associated linear facilities. The project owner will submit any Emergency Termination of Mitigation Reports to the CPM for approval, as required, no later than 10 working days following the termination of the identified mitigation measure. The CPM will monitor the approval of all

reports submitted by the project owner in consultation with CARB, limiting the review time for any one report to no more than 20 working days.

REFERENCES

MID (Modesto Irrigation District). 2001a. Application for Small Power Plant Exemption, Woodland Generating Station 2 Project (01-SPPE-1). Submitted to the California Energy Commission, May 4, 2001.

MID. 2001b. Data Responses: Sets 1 and 2 (Energy Commission Staff Data Requests Nos. 1-48). Submitted to the California Energy Commission, June, 2001.

San Joaquin Valley Air Pollution Control District (District). 2001. District Air Quality Rules and Regulations. <http://www.valleyair.org/rules/1ruleslist.htm>. 2001.

BIOLOGICAL RESOURCES

Testimony of Sandra Etchell

INTRODUCTION

This section of the SPPE Initial Study presents an analysis of potential impacts to biological resources from the MID's proposal for the construction and operation of the WGS2. This analysis is primarily directed toward impacts to state and federally listed species, species of special concern, wetlands, and other areas of critical biological concern. This document presents information regarding the affected biotic community, the potential environmental impacts associated with the 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 document also determines compliance with applicable laws, ordinances, regulations, and standards (LORS), and specifies recommended Conditions of Exemption.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

ENDANGERED SPECIES ACT OF 1973

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

MIGRATORY BIRD TREATY ACT

Title 16, United States Code, sections 703 through 711, prohibits the take of migratory birds, including nests with viable eggs.

CLEAN WATER ACT OF 1977

Title 33, United States Code, sections 1251–1376, and Code of Federal Regulations, part 30, section 330.5(a)(26). The Act requires the permitting and monitoring of all discharges to surface water bodies. Section 404 permits from the U.S. Army Corps of Engineers (USACOE) for discharges from dredged or fill materials into waters of the U.S., including wetlands, and Section 401 permits from the State Water Resources Control Board for the discharge of pollutants are issued under the authority of this Act.

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code, sections 2050 through 2098, protects California's rare, threatened, and endangered species.

CALIFORNIA CODE OF REGULATIONS

Title 14, California Code of Regulations, sections 670.2 and 670.5, lists animals of California designated as threatened or endangered.

FULLY PROTECTED SPECIES

Fish and Game Code, sections 3511, 4700, 5050, and 5515, prohibits take of plants and animals that are fully protected in California.

SIGNIFICANT NATURAL AREAS

Fish and Game Code, section 1930, designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

STREAMBED ALTERATION AGREEMENT

Fish and Game Code, section 1600, reviews project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions and other disturbances.

NATIVE PLANT PROTECTION ACT OF 1977

Fish and Game Code, section 1900 et seq., designates state rare, threatened, and endangered plants.

SETTING

Regionally, the project components are located in the eastern portion of the San Joaquin Valley in Stanislaus and San Joaquin Counties, California. Historically, the San Joaquin Valley contained a variety of natural lands and habitats that supported numerous plant and animal species. Since the turn of the century, however, many of the original natural communities within the Valley have been converted to urban or agricultural land uses. Remaining areas of natural vegetation are fragmented, scattered, and rarely found as large contiguous areas. These remaining natural areas represent less than five percent of the total area within the San Joaquin Valley (USFWS 1998). The loss of habitat has resulted in the elimination of many species of wildlife and the reduction of populations of many other species of wildlife. A list of sensitive species that could occur in the vicinity of the WGS2 is provided in **Biological Resources Table 1**.

BIOLOGICAL RESOURCES: Table 1
Sensitive Species Known to Occur in the Vicinity of the WGS2 Project Area

Sensitive Plants	Status*
Delta Button Celery (<i>Eryngium racemosum</i>)	SC/1b
Sensitive Wildlife	Status
Swainson's hawk (<i>Buteo swainsoni</i>)	ST
Burrowing owl (<i>Athene cunicularia</i>)	SSC
White tailed kite (<i>Elanus leucurus</i>)	FP
Yellow billed cuckoo (<i>Coccyzus americanus occidentalis</i>)	SE
Tricolored blackbird (<i>Agelaius tricolor</i>)	SSC

California tiger salamander (<i>Ambystoma californiense</i>)	SSC
Riparian wood rat (<i>Neotoma fuscipes riparia</i>)	PE
Riparian brush rabbit (<i>Sylvilagus bachmani riparius</i>)	SE
Conservancy Fairy shrimp (<i>Branchinecta conservation</i>)	FE
Vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	FT
Valley Elderberry longhorn beetle (<i>Desmocerus dimorphus dimorphus</i>)	FT
Giant Garter Snake (<i>Thamnophis gigas</i>)	FT

Source: (Modesto Irrigation District, May 2001)

* **Status legend:** CNPS List 1B = Plants rare or endangered in California and elsewhere (California Native Plant Society 1994), SSC = State Species of Special Concern (CDFG 1992), FSC = Federal Species of Special Concern, FE = Federally listed Endangered, FT = Federally listed Threatened, PE = Proposed Endangered, SE = State listed Endangered; ST = State listed Threatened and FP = State Fully Protected.

POWER PLANT FACILITY

The proposed WGS2 natural gas-fueled power plant project area is located adjacent to the Modesto Irrigation District (MID) Woodland 1 facility. Woodland Avenue borders the site to the north, an undeveloped lot to the south, Graphics Drive to the west, and 9th Street and the Union Pacific Railroad (UPRR) tracks to the east. Topography on the site is flat and is zoned for industrial use and therefore, is consistent with the surrounding land use. Currently, the site and laydown area is predominantly paved or graveled with some small areas that contain ornamental, non-native vegetation. No sensitive vegetation, wildlife, or habitat were observed on the site proper. Much of the immediate area surrounding the WGS2 project site has been cleared of native vegetation and is currently industrial land that has been previously disturbed by historical agricultural activities.

GAS PIPELINES

To increase capacity to serve the WGS2 project, two new gas pipeline segments will be required near the City of Ripon. One route, approximately 3.25 miles long, will consist of the installation of steel pipe by trenching and Horizontal Direction Drilling methods. The proposed 3.25-mile long pipeline will tie-in to the Ripon-Modesto Distribution Feeder Main (DFM) near the intersection of South Austin Road and West Ripon Road, then will travel east on West Ripon, south on Jack Tone Road, and west on Doak Boulevard to South Vera Street. The trenching and placement of pipe is proposed to occur within, or immediately adjacent to, City and County streets. A 30-foot construction corridor will be required and trench depth will range from 4 to 8 feet. Due to agricultural and residential development along the project right-of-way (ROW), much of this area has been cleared of native vegetation and was previously disturbed by historical agricultural activities.

The second natural gas pipeline will be constructed by trenching and Horizontal Directional Drilling (HDD) methods. It parallels an existing line and is proposed to consist of the installation of three miles of pipe beginning west of Ripon at the PG&E Ranch Mixing Station, near the intersection of East Avenue D and South Airport way, traveling north to intersect to the local Ripon-Modesto DFM which parallels West Ripon Road. The route passes entirely through agricultural fields and will cross under approximately four irrigation ditches via HDD operations. Some of the ditches support small amounts of wetland and aquatic plants but these

will not be impacted if the irrigation ditches are bored. A frac-out (the release of drilling fluids to the surface) can occur during HDD if the liquids used during directional drilling are forced through fissures in the ground. The drilling mud used most often is bentonite, which can be harmful to aquatic life.

TRANSMISSION FACILITIES

The preferred 69 kV transmission line route would be approximately 1.2 miles long exiting the Woodland 1 traveling east to 9th Street. From 9th Street the transmission line will turn north onto Talley Road, then east onto Stoddard Avenue continuing east to Terminal Avenue then heading northeast along Terminal Avenue to the Ensley Substation where connection will take place. The Union Pacific Railroad (UPRR) ROW is devoid of vegetation. A California Natural Diversity Database (CNNDDB, 2001) search indicates that Burrowing owls, a State Species of Special Concern, may occur along the transmission line UPRR ROW, however none were observed during the field visit. The connecting roads support considerable urban traffic and a mix of residential and smaller industrial land use. The only vegetation occurring in this area consists of landscaping and introduced species. No sensitive habitat or vegetation and no ponded water was observed along the transmission route.

WATER PIPELINE

A 1-mile water pipeline is proposed to be built that would use raw water drawn from an existing water main located at the MID Water Treatment Plant near the corner of 9th Street and Kansas Avenue. The pipeline would be buried in or adjacent to Kansas Avenue and Graphics Avenue and connect into the WGS2 facility to provide water for cooling, process makeup and domestic water needs. The pipeline route would follow existing streets in an industrialized area and is devoid of sensitive habitat.

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
BIOLOGICAL RESOURCES -- Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				X
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		X		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

DISCUSSION OF IMPACTS

The environmental checklist items that address potential impacts to biological resources are discussed below.

A. Effect on Sensitive Species: Less Than Significant with Mitigation Incorporated

The CNDDDB indicates that the proposed project is located within or near the range of several listed species (**Biological Resources Table 1**). Surveys for all species listed on Table 1 should be conducted at 30 days and 10 days prior to construction regardless of time of year.

The only trenching to occur is proposed to take place within roadbeds or within agricultural lands. The road shoulders and surrounding agricultural lands are inhospitable habitat for burrowing owl burrows, therefore no destruction or mitigation for the burrows should be addressed. No valley elderberry shrubs were observed on the entire project site. The CNDDDB indicates that the natural gas pipeline routes are within California tiger salamander habitat, therefore preconstruction surveys will need to be conducted.

Construction of the new transmission line would not likely pose a significant threat for avian collisions because it will generally be quite visible, the project area is not located in a bird migration corridor, and there is no habitat within or adjacent to the project area that would support large populations of flocking birds. In addition, the new transmission line would be located adjacent to the existing transmission line corridor, further reducing the potential for collisions.

B. Effect on Riparian Habitat: No Impact

The WGS2 project area is outside of any riparian habitats or sensitive natural communities as identified or any local or regional plans.

C. Effect on Wetlands: Less Than Significant

There are no Federally protected wetlands, including vernal pools and/or marsh habitat within or adjacent to the WGS2 area. The irrigation ditches along the pipeline route will be avoided by Horizontal Directional Drilling operations. With the implementation of a spill prevention plan, any impact of drilling and a potential frac-out should be less than significant.

D. Interference with Wildlife Movement: Less Than Significant

Sensitive species, such as the Swainson's Hawk, burrowing owl, yellow-billed cuckoo and tricolored blackbird may nest near the project site. Though habitat value is low, pre-construction surveys conducted at 30 days and 10 days prior to construction, and avoidance of any areas containing active nests until nesting season is over is appropriate mitigation to insure less than significant impacts.

E. Conflict with Policies: No Impact

The proposed project will not conflict with any local biological resources policies or ordinances.

F. Conflict with Adopted Habitat Plans: No Impact

Implementation of the proposed project would not interfere with or conflict with any state, regional or local community conservation plans.

CUMULATIVE IMPACTS

Cumulative impacts are those that result from the incremental impacts of an action added to other past, present, and reasonably foreseeable future action, regardless of who is responsible for such actions. Cumulative impacts can result from

individually minor but collectively significant actions taking place over a period of time.

The WGS2 facility is consistent with the current patterns of development and land use surrounding the proposed plant site in Modesto. The power plant would be placed on an existing paved and graveled lot and there are no natural habitats remaining. All activities and disturbance would be limited to on-site.

The transmission line will follow an existing route, which lies in a mix of residential and small industrial areas consisting mostly of ornamental or non-native vegetation. Impacts to this area would be less than significant.

The water and gas pipeline routes are proposed to be located in previously disturbed areas. Pre-construction surveys for the species listed in **Biological Resources Table 1** and avoidance of any of those species found would insure less than significant impact. The project will have very little contributive cumulative effects in regards to biological resources due to past habitat degradation.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

With the implementation of recommended Conditions of Exemption (BIO-1, BIO-2, BIO-3, and BIO-4), this project will be constructed and in compliance with state, federal, and local LORS regarding biological resources.

CONCLUSIONS

The project will result in less than significant impacts to biological resources with the implementation of required pre-construction surveys, and implementation of impact avoidance measures.

PROPOSED CONDITIONS OF EXEMPTION

The following Biological Resources Conditions of Exemption are proposed by Energy Commission staff:

DESIGNATED BIOLOGIST

BIO-1 Site mobilization shall not begin until an approved Designated Biologist is available to be on site.

The Designated Biologist must meet the following minimum qualifications:

- A Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
- At least three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;

- At least one year of field experience with biological resources found in or near the project area; and
- An ability to demonstrate to the satisfaction of the Staff the appropriate education and experience for the biological resources tasks that must be addressed during project construction and operation.

If the Compliance Project Manager (CPM) determines the proposed Designated Biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved Designated Biologist needs to be replaced, the project owner shall obtain approval of a new Designated Biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No disturbance will be allowed in any designated sensitive areas until the CPM approves a new Designated Biologist and the new biologist is on site.

Verification: At least 60 days prior to the start of any site mobilization activities, the project owner shall submit to the CPM for approval, the name, qualifications, address and telephone number of the individual selected by the project owner as the Designated Biologist. If a Designated Biologist is replaced, the information on the proposed replacement, as specified in the condition, must be submitted in writing at least ten working days prior to the termination or release of the preceding Designated Biologist.

BIO-2 The CPM approved Designated Biologist shall perform the following during project construction and operation: A Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;

- Advise the Applicant's Construction Manager on the implementation of the Biological Resource Conditions of Exemption;
- Supervise or conduct mitigation, monitoring and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as, wetlands and special status species; and
- Notify the project owner and the CPM of non-compliance with any Biological Resources Conditions of Exemption.

Verification: During project construction, the Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the Staff. During project operation, the Designated Biologist shall submit record summaries in the Monthly and Annual Compliance Reports.

BIO-3 The project owner's Construction Manager shall act on the advice of the Designated Biologist to ensure conformance with the Biological Resources Conditions of Exemption.

Protocol: The project owner's Construction Manager shall halt, if necessary, all construction activities in areas specifically identified by the

Designated Biologist as sensitive to assure that potential significant biological resource impacts are avoided.

The Designated Biologist shall:

- Inform the project owner and the Construction Manager when to resume construction, and
- Advise the CPM if any correction actions are needed or have been instituted.

Verification: Within two (2) working days of a Designated Biologist notification of non-compliance with a Biological Resources Condition of Exemption or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five (5) working days after receipt of notice that corrective action is completed, or the project owner will be notified by CPM that coordination with other agencies will require additional time before a determination can be made.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-4 The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and shall implement the measures identified in the plan. Any changes made to the adopted BRMIMP must be made in consultation with CPM, the California Department of Fish and Game (CDFG) and U.S. Fish and Wildlife Service (USFWS).

Protocol: The final BRMIMP shall identify and observe:

- All biological resources mitigation, monitoring and compliance conditions included in the Energy Commissions Final Decision;
- All preconstruction survey protocols for the giant garter snake, tiger salamander, burrowing owl, and nesting birds;
- All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation and closure;
- All mitigation measures identified through consultation with the USFWS and CDFG;
- All required mitigation measures/avoidance strategies for each sensitive biological resources;
- All locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;
- Spill (frac-out) contingency clean-up plan;

- Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
- All performance standards and remedial measures to be implemented if performance standards are not met; and
- A process for proposing plan modifications to the CPM and appropriate agencies for review and approval.

Verification: At least 30 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final version of the BRMIMP, and the CPM will determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved BRMIMP must be made only after consultation with CPM, USFWS, and CDFG. The project owner shall notify the CPM five (5) working days before implementing any CPM approved modifications to the BRMIMP.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which mitigation and monitoring plan items are still outstanding.

REFERENCES

- Avian Power Line Interaction Committee. 1994. *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1994*. Edison Electric Institute/Raptor Research Foundation, Washington, D.C. 155 pp.
- California Native Plant Society. 1994. *Inventory of Rare and Endangered Vascular Plants of California*.
- California Natural Diversity Database (CNDDDB). 2001. California Department of Fish and Game.
- Modesto Irrigation District. 2000a. Woodland Generation Station 2 – Application for Small Power Plant Exemption. Submitted to the California Energy Commission on May 19, 2001.
- Modesto Irrigation District. 2000b. Responses to Data Requests. Submitted to the California Energy Commission in June, 2001.

CULTURAL RESOURCES

Testimony of Roger D. Mason

INTRODUCTION

The cultural resources section discusses potential impacts of the proposed WGS2 in Modesto (MID) regarding cultural resources, which are defined as the structural and cultural evidence of the history of human development and life on earth. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant cultural resources, including prehistoric archaeological resources, historic archaeological resources, and ethnographic resources, during project construction, operation, and closure. Energy Commission staff designated all of the CEQA checklist items for cultural resources as "less than significant with mitigation incorporation." A brief cultural overview of the project is provided, as are comments regarding selected CEQA checklist items with respect to cultural resources. The section concludes with the staff's proposed monitoring and mitigation measures with respect to cultural resources, with the inclusion of fifteen recommended Conditions of Exemption.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Cultural resources are indirectly protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, Section 431 et seq.) and subsequent related legislation, policies, and enacting responsibilities, e.g., federal agency regulations and guidelines for implementation of the Antiquities Act. The following laws, ordinances, regulations, standards, and policies apply to the protection of cultural resources in California. Projects licensed by the Energy Commission are reviewed to ensure compliance with these laws.

STATE

- Public Resources Code, Section 5020.1 defines several terms, including the following:
 - (j) "Historical resource" includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.
 - (q) "Substantial adverse change" means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.
- Public Resources Code, Section 5024.1 establishes a California Register of Historic Resources (CRHR). The implementing regulations are California Code of Regulations, Chapter 11.5, Section 4850 et seq.
- The California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.; Title 14, California Code of Regulations, Section 15000

et seq.) requires analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.

- Public Resources Code Section 21083.2 states that the lead agency determines whether a project may have a significant effect on “unique” archaeological resources; if so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, the lead agency may require reasonable steps to preserve the resource in place. Otherwise, mitigation measures shall be required as prescribed in this section. The section discusses excavation as mitigation; limits the Applicant’s cost of mitigation; sets time frames for excavation; defines “unique and non-unique archaeological resources”; and provides for mitigation of unexpected resources.
- Public Resources Code Section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource; the section further defines a “historic resource” and describes what constitutes a “significant” historic resource.
- CEQA Guidelines, Title 14, California Code of Regulations, Section 15126.4(b) prescribes the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project’s impact on a historical resource; discusses documentation as a mitigation measure; and discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.
- CEQA Guidelines, Section 15064.5 defines the term “historical resources,” explains when a project may have a significant effect on historic resources, describes CEQA’s applicability to archaeological sites, and specifies the relationship between “historical resources” and “unique archaeological resources.”
- Penal Code, Section 622 1/2 states that anyone who willfully damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.
- California Health and Safety Code, Section 7050.5 states that if human remains are discovered during construction, the project owner is required to contact the county coroner.
- Public Resources Code, Section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials. This section also prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.
- Public Resources Code Section 5097.99 provides restrictions on the possession of human remains or grave related artifacts. Part (b) specifies exceptions and states a person in violation of this section is guilty of a felony. Part (c) expands the section to say that any person, not under authority of law,

who removes Native American artifacts or human remains with an intent to sell or vandalize them is guilty of a felony.

LOCAL

San Joaquin and Stanislaus Counties have adopted general plans and ordinances to promote preservation of significant cultural and historical resources. Goal 8, Policies 5 and 6 of the Stanislaus County General Plan Conservation/Open Space Element requires preservation of “Qualified Historical Buildings” as defined by the State Building Code. The General Plan also encourages preservation of other resources of national, state, regional, and local historical importance. The City of Modesto has a Landmark Preservation Ordinance that promotes preservation and enhancement of structures and natural features with historical or archaeological significance. Certain areas within the City have been defined as archaeologically sensitive zones.

SETTING

The proposed power plant, water line, and electrical transmission lines will be located primarily in the City of Modesto in Stanislaus County. A small segment of the water supply line extends into an unincorporated portion of Stanislaus County. In addition, a gas supply line necessary for the project will be constructed in the City of Ripon and in an unincorporated portion of San Joaquin County west of Ripon. The project area is in the central San Joaquin Valley. Modesto is located along the Tuolumne River and Ripon is located along the Stanislaus River. However, the specific areas affected by the project in Modesto are over 1.5 miles from the Tuolumne River. In Ripon, the gas line is 0.5 mile from the Stanislaus River at its nearest approach and most of the line is much farther from the river. The area’s climate is characterized as Mediterranean, including hot dry summers and cool moist winters. The proposed project area in Modesto is primarily urban industrial. The transmission line route also passes through a community college and a residential area. The gas line runs through an urban residential area in Ripon and an agricultural area west of Ripon.

The prehistory of the northern San Joaquin Valley is not well known. Few sites have been investigated and most of these date to the Late Prehistoric Period. Earlier sites are likely buried under later Holocene alluvium. The archaeological sites appear to reflect the same settlement and subsistence systems practiced by the Northern Valley Yokuts who occupied the area when the Spanish arrived in California (Wallace 1978). The northern San Joaquin Valley was originally covered by sloughs and marshes along the San Joaquin River. The Northern Valley Yokuts obtained fish and waterfowl from the river and marshes. Grass and tule seeds were important plant foods. Acorns from the valley oaks were also collected. The two most important food resources were salmon and acorns. Although deer, antelope, and elk were abundant, big game hunting was not a major food procurement activity. The Yokuts lived in permanent villages on mounds along the river. Gathering parties left the villages seasonally to collect seeds and acorns. The Northern Valley Yokuts were organized in territorial tribelets of up to 300 people (Wallace 1978). One would expect to find large prehistoric archaeological sites

representing villages along rivers. Smaller sites with a more restricted range of artifacts and subsistence remains, representing resource gathering camps, could be found anywhere in Yokuts territory that was not subject to inundation.

During the nineteenth century, the drier areas of the northern San Joaquin Valley were used for ranching. Agricultural use of the region did not begin until 1867 when wheat cultivation became important (MID 2001:8.3-12). Completion of the Central Pacific Railroad through the valley in 1870 increased the scale of wheat production by reducing transportation costs. The Central Pacific Railroad was later incorporated into the Southern Pacific Railroad system and the Santa Fe Railroad acquired a parallel line through the valley. Towns, such as Modesto, developed along the rail lines and farms developed along the rivers and drainages. Modesto was surveyed into town lots by a Central Pacific Railroad surveyor in 1870 (MID 2001:8.3-12). The area around Modesto remains mostly agricultural today. Archaeological sites from the historical period that could be significant would include subsurface physical remains associated with nineteenth century residences, stores, and small scale manufacturing enterprises in towns, and farmsteads in rural areas.

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
CULTURAL RESOURCES – Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?		X		
c) Disturb any human remains, including those interred outside of formal cemeteries?		X		

DISCUSSION OF IMPACTS

A. Effect on Historical Resources: Less than Significant with Mitigation Incorporated

- I. Twelve properties with above-ground resources of historic age have been identified within one-half mile of the power plant site and the linear routes in Modesto (MID 2001a). These consist of commercial and industrial properties with multiple structures and properties with individual industrial and commercial structures, such as railroad depot, cleaners, auto painting, petroleum storage, café, and market. All of these properties, with the exception of the railroad depot, have been evaluated as not eligible for the National Register of Historic

Places, according to the Office of Historic Preservation's Historic Property Data File. The Union Pacific Depot has been evaluated as eligible, but is one half mile south of the project area and will not be affected by the project.

- II. Two potential historic resources were identified during the Applicant's field survey of the gas line route in the Ripon area (CH2M Hill 2001). A barn that appears to be more than 50 years old is located on the north side of West Ripon Road between Austin Road and Frederick Avenue and about 20 feet from the edge of pavement. Approximately half of the barn has been demolished by the owner. It would appear that the barn lacks integrity of workmanship and therefore is not eligible for the California Register of Historical Resources. A windmill is located about 100 feet from the centerline of the gas line route through the agricultural fields. The windmill would not be eligible for the California Register under Criteria A or B because it is not associated with a residence or settlement. It appears moveable and is just used to provide water for cattle. It has no distinctive architectural or engineering characteristics (Criterion C), as it is one of many such windmills in the Central Valley.
- III. There will be no impacts on any non-archaeological historical resources as a result of the proposed project because the linear water and gas lines will be installed below-ground by trenching in street and road rights-of-way (ROWS). The barn will not be impacted, because one of the proposed Conditions of Exemption will require avoidance. Replacement of existing power poles with new power poles will not affect the setting of any potential historical resource. Similarly, construction of a new WGS2 power plant adjacent to the existing Woodland 1 power plant will not affect the setting of any nearby potential historical resource.
- IV. Proposed Condition of Exemption CUL- 9 requires avoidance of the barn along West Ripon Road. Implementation of the proposed Condition of Exemption will reduce impacts to the barn to a level of insignificance.

B. Cause a Change in Significance of an Archaeological Resource: Less than Significant with Mitigation Incorporated

- I. Three below-ground resources of historic age have been recorded within one-half mile of the gas line route in the Ripon area (MID 2001a). All three of these are irrigation canals that have been evaluated as not eligible for the National Register of Historic Places, according to the Office of Historic Preservation's Historic Property Data File. One below-ground archaeological resource of historic age has been identified about one half mile from the Modesto project area. It consists of concrete foundations and a brick wall. It has been evaluated as not eligible for the National Register of Historic Places, according to the Office of Historic Preservation's Historic Property Data File.
- II. The consultant for the Applicant carried out a pedestrian survey of the gas line linear route in the Ripon area and a windshield survey of the paved linear routes in Modesto. The proposed power plant site was not surveyed because it has been graded and covered with gravel. No archaeological resources were identified as a result of the survey (CH2M Hill 2001).

- III. The proposed project will not impact any known archaeological resource. However, there is a potential for discovering previously unidentified archaeological resources during construction. The Applicant recommended that subsurface construction be monitored by an appropriately qualified archaeological monitor under the supervision of the Project Archaeologist. The Applicant also recommended that an appropriate Native American monitor be present during any testing or data recovery of archaeological material that is Native American in origin.
- IV. In the event of an unanticipated discovery, the proposed Conditions of Exemption **CUL-1** through **CUL-15** shall apply. Implementation of the proposed Conditions of Exemption **CUL-1** through **CUL-15** will reduce impacts to any archaeological resource identified during construction to a level of insignificance.

C. Disturb Human Remains: Less than Significant with Mitigation Incorporated

There is no record of interred human remains that would be disturbed by the proposed project. In the event that interred human remains are encountered during project construction, the proposed Conditions of Exemption **CUL-1** through **CUL-15** shall apply.

CUMULATIVE IMPACTS

Staff concludes that there are no known cumulative impacts because the project will not affect any known cultural or historical resources. Should any cultural resources be identified during construction, implementation of the proposed Conditions of Exemption **CUL-1** through **CUL-15** will reduce cumulative impacts to a level of insignificance.

CONCLUSIONS

Based on the discussion above, the project will not cause any significant impacts to cultural resources provided the following Conditions of Exemption are implemented.

PROPOSED CONDITIONS OF EXEMPTION

CUL-1 Prior to the start of ground disturbance, the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name and statement of qualifications for its Cultural Resources Specialist (CRS), and one alternate CRS, if an alternate is proposed, who will be responsible for implementation of all cultural resources Conditions of Exemption.

Protocol: The statement of qualifications for the CRS and alternate shall include all information needed to demonstrate that the CRS meets the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published by the State Office of Historic Preservation (1983). The minimum qualifications include the following:

- a graduate degree in anthropology, archaeology, California history, cultural resource management, or a comparable field;
- at least three years of archaeological resource mitigation and field experience in California; and
- at least one year's experience in each of the following areas:
 - 1) leading archaeological resource field surveys;
 - 2) leading site and artifact mapping, recording, and recovery operations;
 - 3) marshalling and use of equipment necessary for cultural resource recovery and testing;
 - 4) preparing recovered materials for analysis and identification;
 - 5) determining the need for appropriate sampling and/or testing in the field and in the lab;
 - 6) directing the analyses of mapped and recovered artifacts;
 - 7) completing the identification and inventory of recovered cultural resource materials; and
 - 8) preparing appropriate reports to be filed with the receiving curation repository, the State Historic Preservation Office, all appropriate regional archaeological information center(s).

The statement of qualifications for the CRS shall include:

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

Verification: At least forty-five days prior to the start of ground disturbance, the project owner shall submit the name and statement of qualifications of its CRS and alternate CRS, if an alternate is proposed, to the CPM for review and approval.

At least ten days, prior to the start of construction, the project owner shall confirm in writing to the CPM that the approved CRS will be available at the start of construction and is prepared to implement the cultural resources Conditions of Exemption.

At least ten days prior to the termination or release of the CRS, the project owner shall obtain CPM approval of the replacement CRS by submitting to the CPM the name and resume of the proposed new CRS.

CUL-2 Prior to the start of ground disturbance, the project owner shall provide the designated cultural resources specialist and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps provided will include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts.

If the designated cultural resource specialist requests enlargements or strip maps for linear facility routes, the project owner shall provide them. In addition, the project owner shall provide a set of these maps to the CPM at the same time that they are provided to the specialist. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the cultural resources specialist and the CPM within five days. Maps shall show the location of all areas where surface disturbance may be associated with project-related access roads, and any other project components.

Verification: At least forty days prior to the start of ground disturbing activities on the project, the project owner shall provide the designated cultural resources specialist and the CPM with the maps and drawings. Copies of maps or drawings reflecting changes to the footprint of the power plant and/or linear facilities shall be submitted to the cultural resources specialist and the CPM within five days of the changes.

CUL-3 Prior to the start of ground disturbance, the CRS shall prepare, and the project owner shall submit to the CPM for review and approval, a Cultural Resources Monitoring and Mitigation Plan (CRMMP), identifying general and specific measures to minimize potential impacts to cultural resources and procedures to be followed in the event of an unanticipated discovery.

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

- a. Identification of the person(s) expected to perform monitoring tasks; a description of each team member's qualifications (resumes) and their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.
- b. A discussion of the inclusion of Native American observers or monitors, in the event of an unanticipated discovery, the procedures to be used to select them, and their roles and responsibilities.
- c. A discussion of any measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long the measures will be needed to protect the resources from project-related effects.
- d. A discussion of the location(s) where monitoring of project construction activities is deemed necessary by the CRS. The specialist will determine the size or extent of the areas where monitoring is to occur and will establish the percentage of the time that the monitor(s) will be present. The discussion shall include a plan for monitoring to occur full time in the vicinity of the barn that is located on the north side of West Ripon Rd.

- e. A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and that all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum. The public repository or museum must meet the standards and requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.
- f. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.
- g. Identification of the public institution that has agreed to receive any data and cultural resources recovered during monitoring and mitigation work. Discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation and how they will be met. Also the name and phone number of the contact person at the institution shall be included.

Verification: At least thirty days prior to the start of ground disturbance, the project owner shall provide the CRMMP, prepared by the CRS, to the CPM for review and approval.

CUL-4 Prior to the start of ground disturbance, the CRS shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and approval.

The training plan and all program components will be submitted to the CPM. The drafts of the training plan and the program components will be reviewed and approved. The training program shall discuss the potential to encounter cultural resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall include a lecture and a video, if a video is desired, that address the following topics: (1) applicable state and federal laws pertaining to cultural resources; (2) cultural materials that, upon discovery, will require notification of the construction supervisor, cultural resources monitor, and/or CRS; and (3) authority of the CRS, alternate CRS, or Cultural Resources Monitor(s) to halt or redirect construction activities that have the potential to affect cultural resources. The training program shall also include the set of resource reporting procedures and work curtailment procedures that workers are to follow if previously unknown cultural resources are encountered during project activities. The training program shall include the statement that the CRS, alternate CRS or cultural resources monitor has the authority to halt construction in the event of an unanticipated discovery. The employees shall be given a small durable Environmental Awareness Training Manual that includes all of the legal and procedural information necessary to fulfil the Conditions of Exemption and contact names of the CRS and alternate CRS.

A form shall be developed as part of the cultural resources awareness program for the workers to sign that certifies (1) their completion of the environmental awareness training program, (2) their understanding of their responsibilities under the program, and (3) their comprehension of potential legal penalties that could be sought against them individually should they violate applicable laws.

The training program may be combined with other training programs prepared for biological resources, paleontological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least thirty-five days prior to the start of project related vegetation clearance, earth disturbing activities, or project site preparation, the project owner shall submit to the CPM for review and approval, the proposed employee training plan and its components (e.g., the script of the proposed video if one is proposed), and the name and resume of the individual(s) performing the training.

CUL-5 Prior to the start of ground disturbance and throughout the period of ground disturbance, for all new employees, the project owner shall ensure that the CRS or qualified individual(s) approved by the CPM provide the CPM-approved cultural resources training in-person to all project managers, construction supervisors, and workers. If a video or general environmental training is provided, then in-person training provided by the CRS or CPM approved trainer shall be provided for new employees at least every two weeks. If there is no video or general environmental training, then the in-person training shall be provided for new employees at least once a week. Tailgate sessions are acceptable. The project owner shall ensure that the designated trainer provides the workers with the CPM-approved set of procedures for reporting any sensitive resources that may be discovered during ground disturbance and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction.

Training at the project site may be discontinued after all ground disturbance at the site has concluded and the CRS has inspected the site and determined that no cultural resources will be impacted. Training shall continue for project personnel working in the vicinity of other project components, including linears and landscaping, until ground disturbance is concluded at these locations.

Verification: In each Monthly Compliance Report (MCR) after the start of construction, the project owner shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided the CPM-approved cultural resources training and the set of reporting and work curtailment procedures to all workers.

CUL-6 The CRS, alternate CRS, and the Cultural Resources Monitor(s) shall have the authority to halt or redirect construction if previously unknown

cultural resource sites or materials are encountered, or if known resources may be impacted in a previously unanticipated manner.

If such resources are found, the halting or redirection of construction shall remain in effect until all of the following have occurred:

- a. the CRS has notified the CPM and the project owner of the find and the work stoppage;
- b. the CRS, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and
- c. any necessary data recovery and mitigation has been completed.

If data recovery or other mitigation measures are required, the CRS and/or the alternate CRS and cultural resource monitor(s), including Native American monitor(s), shall monitor these data recovery and mitigation measures, as needed.

For any cultural resource encountered, the project owner shall notify the CPM within 24 hours after the find.

All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

Verification: At least thirty days prior to the start of ground disturbance, the project owner shall provide the CPM with a letter confirming that the CRS, alternate CRS, and Cultural Resources Monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find and stating that the CRS will notify the CPM and project owner within 24 hours after a find.

CUL-7 Prior to the start of ground disturbance, and each week throughout project construction, the project owner shall provide the CRS with a current schedule of anticipated project activity in the following month and a map indicating the area(s) where the construction activities will occur. The CRS shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Verification: Ten days prior to the start of ground disturbance, and in each Monthly Compliance Report thereafter, the project owner shall provide the CPM with a copy of each weekly schedule of the construction activities. The project owner shall notify the CPM when all ground disturbing activities, including landscaping, are completed.

CUL-8 Throughout monitoring and mitigation phases of the project, the CRS, alternate CRS, and Cultural Resources Monitor(s) shall keep a daily log of any resource finds and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The daily logs shall indicate by tenths of a post mile, where and

when monitoring has taken place; where monitoring has been deemed unnecessary; and where cultural resources were found.

The CRS shall prepare a weekly summary of the daily logs on the progress or status of cultural resource-related activities.

The CRS and monitor(s) may informally discuss the cultural resource monitoring and mitigation activities with Energy Commission technical staff.

Verification: Throughout the project construction period, the project owner shall ensure that the daily log(s) and the weekly summary reports prepared by the CRS and monitor(s) are available for periodic audit by the CPM.

CUL-9 Cultural Resource monitoring shall be conducted full time, during ground disturbance, in the vicinity of the barn that is located on the north side of West Ripon Road between Austin Road and Frederick Avenue. The monitoring shall ensure avoidance of the barn. In addition, the CRS, alternate CRS, and Cultural Resources Monitor(s) shall be present at times the CRS deems appropriate to monitor ground disturbance for all components of the project.

Protocol: If the CRS determines that monitoring is necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner and the CPM of the planned monitoring. The CRS shall use milepost markers and boundary stakes placed by the project owner to identify areas where monitoring is being activated and deemed necessary.

Verification: Throughout the project construction period, the project owner shall include in the Monthly Compliance Reports to the CPM copies of the weekly summary reports prepared by the CRS regarding cultural resource monitoring.

CUL-10 The project owner shall ensure that the CRS performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural resource materials encountered and collected during pre-construction surveys and during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the museum(s), universit(y/ies), or other appropriate research specialists. The project owner shall maintain these files for the life of the project and the files shall be kept available for periodic audit by the CPM. Information as to the specific location of sensitive cultural resource site shall be kept confidential and accessible only to qualified cultural resource specialists.

CUL-11 After completion of the project, the project owner shall ensure that the CRS prepares a Cultural Resource Report (CRR) according to Archaeological Resource Management Reports (ARMR) Guidelines as recommended by the California Office of Historic Preservation. The project

owner shall submit the report to the CPM for review and approval. The report shall be considered final upon approval by the CPM.

Protocol: The CRR shall include (but not be limited to) the following:

a. For all projects:

- 1) description of pre-project literature search, surveys, and any testing activities;
- 2) maps showing areas surveyed or tested;
- 3) description of any monitoring activities;
- 4) maps of any areas monitored; and
- 5) conclusions and recommendations.

b. For projects in which cultural resources were encountered, include the items specified under “a” and also provide:

- 1) site and isolated artifact records and maps;
- 2) description of testing for, and determinations of, significance and potential eligibility; and
- 3) research questions answered or raised by the data from the project.

c. For projects regarding which cultural resources were recovered, include the items specified under “a” and “b” and also provide:

Protocol:

- 1) descriptions (including drawings and/or photos) of recovered cultural materials;
- 2) results and findings of any special analyses conducted on recovered cultural resource materials;
- 3) an inventory list of recovered cultural resource materials; and
- 4) the name and location of the public repository receiving the recovered cultural resources for curation.

Verification: After completion of the project, project owner shall ensure that the CRS completes the CRR within ninety days following completion of the analysis of the recovered cultural materials. Within seven days after completion of the report, the project owner shall submit the CRR to the CPM for review and approval.

CUL-12 The project owner shall submit an original, an original-quality copy, and a computer disc copy (or other format to meet the repository's requirements), of the CPM-approved CRR to the public repository to receive the recovered data and materials for curation, with copies to the State Historic Preservation Officer (SHPO), and the appropriate regional archaeological information center(s). If the report is submitted to any of these entities on a computer disc, the disc files must meet SHPO requirements for format and content.

Protocol: The copies of the CRR to be sent to the entities specified above shall include the following (based on the applicable scenario [a, b, or c] set forth in condition Cul-11):

- a. originals or original-quality copies of all text;
- b. originals of any topographic maps showing site and resource locations;
- c. originals or original-quality copies of drawings of significant or diagnostic cultural resource materials found during pre-construction surveys, or during project monitoring and mitigation and subjected to post-recovery analysis and evaluation.
- d. photographs of any cultural resource site(s) and the various cultural resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation. The project owner shall provide the curation repository with a set of negatives for all of the photographs.

Verification: Within thirty days after receiving approval of the CRR, the project owner shall provide to the CPM documentation that the report has been sent to the public repository receiving the recovered data and materials for curation, the SHPO, and the appropriate archaeological information center(s).

For the life of the project, the project owner shall maintain in its compliance files copies of all documentation related to the filing of the CPM-approved CRR with the public repository receiving the recovered data and materials for curation.

CUL-13 Following the filing of the CPM-approved CRR with the appropriate entities, the project owner shall ensure that all cultural resource materials, maps, and data collected during data recovery and mitigation for the project are delivered to a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources. The project owner shall pay any fees for curation required by the repository.

Verification: The project owner shall ensure that all recovered cultural resource materials are delivered for curation within thirty days after providing the CPM-approved CRR.

For the life of the project the project, owner shall maintain in its of compliance files, copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all cultural resource materials collected during data recovery and mitigation for the project.

CUL-14 Prior to the start of any ground disturbance, the project owner and/or the designated cultural resources specialist shall consult with Native American

tribal representatives and retain a Native American monitor to be present during ground disturbance in areas where Native American artifacts may be discovered. Preference in monitoring shall be granted to Native Americans with traditional ties to the area that will be monitored. The monitor(s) shall be considered a member(s) of the cultural resource team and shall be present during the ground disturbing phases of the project whenever there is a possibility that Native American artifacts may be discovered.

Verification: At least fifteen days prior to the start of ground disturbance, the project owner shall provide the CPM with notification stating that a representative of the Native American community has been retained to monitor. The notification shall confirm that he/she has been retained for the purpose of cultural resource monitoring on the WGS2 project. If efforts to obtain the services of qualified Native American monitor(s) prove unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process.

CUL-15 Prior to initial project site mobilization (i.e., placing a trailer on the site with accompanying equipment, utilities and grading) the project owner must comply with Cul-1, Cul-2, and Cul-4, and complete Cul-5 as it pertains to management, supervisors, and workers involved in this undertaking. The project owner shall comply with Cul-3 for the entire project, but this need not be accomplished before the trailer is placed. If cultural resources are discovered, all cultural Conditions of Exemption shall apply.

Prior to the initial site mobilization, the designated cultural resource specialist shall examine the area of initial project site mobilization and ensure that there are no cultural resources that may require protection or mitigation.

Verification: At least seven days prior to engaging in the initial project site mobilization defined in this condition, the project owner shall provide the CPM with information authored by the designated cultural resource specialist identifying the area of initial site mobilization. The cultural resource specialist shall indicate the method(s), procedure(s), and date(s) the cultural resource inspection was performed and an explanation of the anticipated project activities. The document will be reviewed and approved by the CPM.

REFERENCES

- CH2M Hill. 2001. Cultural Resources Survey Report for the Woodland Generation Station 2 Project, Modesto and Stanislaus Counties. Prepared for Modesto Irrigation District. Submitted to the California Energy Commission, July, 2001.
- MID (Modesto Irrigation District). 2001a. Application for Small Power Plant Exemption, Woodland Generation Station 2. Submitted to the California Energy Commission, May 4, 2001.

ENERGY RESOURCES

Testimony of James C. Henneforth

INTRODUCTION

This section examines energy use by the MID's proposed WGS2 to ensure that the WGS2 consumption of energy will not result in significant adverse impacts on the environment. To accomplish this, staff addresses the issue of inefficient and unnecessary consumption of energy by: 1) determining whether the facility will likely present any adverse impacts upon energy resources; and 2) determining whether these adverse impacts are significant.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

No federal laws apply to the efficiency of this project.

STATE

CALIFORNIA ENVIRONMENTAL QUALITY ACT GUIDELINES

CEQA Guidelines (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, § 1500000 et seq., Appendix F).

WARREN-ALQUIST ACT

The Warren-Alquist Act requires the submittal to the Energy Commission of a Notice of Intent (NOI) prior to filing an Application for Certification (AFC) (Pub. Resources Code, § 25502). The AFC process commonly takes twelve months. Exemption from that process is allowed for certain projects. WGS2 qualifies for exemption from the NOI process through § 25540.6(a)(4), and thus is evaluated in the 135-day Small Power Plant Exemption process.

LOCAL

No local or county ordinances apply to energy resources or power plant efficiency.

SETTING

MID proposes to construct and operate a natural gas fueled power plant at the site of their existing 49.4 MW Woodland 1 Generating Station located in northern Modesto in Stanislaus County. Power from the facility will be sold directly to customers of MID: residential, commercial, and industrial power users in the area (WGS2 2001a, SPPE §§1.1, 2.1). The WGS2 will consist of a single General Electric LM6000 enhanced SPRINT combustion turbine generator (CTG) rated at 47 MW and a single condensing steam turbine generator (STG) rated at 37 MW. The CTG will utilize an electric chiller at its inlet to maintain output and efficiency during periods of high ambient temperatures. The CTG will exhaust hot gases into a heat recovery steam generator (HRSG) that will produce the steam to drive the STG. The inlet to the HRSG will have duct burners to be fired with natural gas to produce additional steam for use in generating additional electrical energy during periods of peak power requirements. The CTG will utilize water injection to reduce the formation of NO_x and the HRSG will have a selective catalytic reduction system to further control the emissions of NO_x from the plant. The output of the plant without duct firing will be 57.77 MW net and with duct firing 79.84 MW net (WGS2 2001a, SPPE §§2.2, 2.4.2.1).

IMPACTS

A. Energy Efficiency: Less Than Significant Impact

CEQA's Initial Study Checklist does not include impacts related to energy efficiency. However, the inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas, constitutes an adverse environmental impact (Cal. Code regs., tit. 14, § 15126.4(a)(1) and tit. 14, § 15000 et seq., Appendix F). 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.

ENERGY REQUIREMENTS

Any power plant large enough to fall under Energy Commission siting jurisdiction (greater than 50 MW) will consume large amounts of energy. The WGS2 will burn natural gas at a nominal rate up to 16.2 billion Btu per day Higher Heating Value (HHV) (WGS2 2001a, SPPE Table 2.4-2). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies.

ENERGY USE EFFICIENCY

Under expected project conditions, electricity will be generated at a full load efficiency of approximately 49.04 percent LHV (Lower Heating Value) with the combustion turbine operating at full load with duct firing (WGS2 2001a, SPPE §7.1). In comparison, the average fuel efficiency of a typical utility company baseload

power plant is approximately 35 percent LHV. These figures represent efficient plants and typical state-of-the-art equipment.

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

According to the Applicant's description of its sources of supply of natural gas for the WGS2 (MID 2001a, SPPE §§2.4.5,7.2), the project will burn natural gas delivered to the site by PG&E, which plans to expand its pipe capacity to meet the expanded needs of MID. The PG&E gas supply infrastructure is extensive, offering access to vast reserves of gas from the Rocky Mountains, Canada, Texas and the Southwest. The Applicant plans to purchase gas supplies through a combination of firm gas contracts, as well as procuring additional supplies on the spot market. These sources represent far more available gas than would be required for a project this size. Energy Commission predictions are that natural gas supplies will be adequate for many years into the future. It is therefore highly unlikely that the WGS2 could pose a substantial increase in demand for natural gas in California that would result in an adverse impact

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

Natural gas fuel will be supplied to the project through MID's existing connection to PG&E at the Woodland 1 plant. However, PG&E has determined that to serve the project it will be required to upgrade its existing gas system to provide added capacity. Accordingly, in and near the City of Ripon, PG&E will install approximately 3 miles of 16-inch diameter pipe from Avenue D to West Ripon Road approximately 1500 feet east and parallel to Union Road plus and additional approximately 3 miles of new pipe along West Ripon Road from Austin to Jack Tone Road, turning south to Doak Road and west again to Vera Avenue (MID 2001b). With these new pipeline segments, these lines will provide adequate access to the required natural gas fuel that is available for reliable plant operations.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of the WGS2.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT, AND UNNECESSARY ENERGY CONSUMPTION

The WGS2 could be deemed to create adverse impacts on energy resources if alternatives existed that would significantly 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 expected energy consumption. Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by the selection of equipment used to generate power.

PROJECT CONFIGURATION

The WGS2 will be configured as a combined-cycle power plant, in which electricity is generated by a gas turbine, and additionally by a steam turbine that operates on heat energy recuperated from the gas turbine's exhaust (MID 2001a, SPPE §1.1, 2.1). By recovering this heat, which would otherwise be lost up the exhaust stack,

the efficiency of any combined-cycle power plant is increased considerably from that of either a gas turbine or steam turbine operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

EQUIPMENT SELECTION

Modern gas turbines in combined-cycle configuration embody the most fuel-efficient electric generating technology available today. The GE LM 6000 enhanced SPRINT gas turbine to be employed in the WGS2 has a nominal rating of 47 MW and represents one of the most modern and efficient such machines now available. The Applicant will employ this combustion turbine in a one-on-one configuration with a steam turbine generator that is nominally rated at 37 MW generating capacity. During normal baseload conditions the plant will operate without duct firing, and the steam turbine generator will produce approximately 13 MW. During this mode of operation the plant will produce approximately 57.7 MW net. For peak periods of operation the plant will employ duct firing to maximize the output of the steam turbine generator. During this mode of operation and considering auxiliary loads and plant losses, the WGS2 plant will produce approximately 80 MW.

Two alternatives to the proposed equipment are:

- The ABB Alstom Power KA 10C-2, nominally rated at 83.6 MW and 51.8 percent efficiency at ISO conditions in a one-on-one combined-cycle configuration.
- The Siemens-Westinghouse W251B, nominally rated in a one-on-one combined-cycle at 71.5 MW and 47.8 percent efficiency LHV at ISO conditions.

The proposed GE LM6000 SPRINT turbine selected has a fuel efficiency of 49 percent LHV in a one-on-one combined-cycle configuration at site conditions. Therefore, any differences among the three in actual operating efficiency will be relatively insignificant. Selecting among these machines is based partly on other factors, such as generating capacity, cost, and ability to meet air pollution limitations.

EFFICIENCY OF ALTERNATIVES TO THE PROJECT

The Applicant addresses alternative generating technologies in its application (MID 2001a, SPPE § 9.5, 9.6). This information is summarized below.

ALTERNATIVE GENERATING TECHNOLOGIES

The Applicant considers the following alternative generating technologies in its application (MID 2001a, SPPE §9.6): conventional boiler steam turbine, supercritical boiler steam turbine, simple-cycle combustion turbine, advanced gas turbine cycles, fuel cells, coal-burning technologies, nuclear, hydroelectric, geothermal, ocean energy conversion, biomass, and solar technologies. Given the project objectives, as well as location and air pollution control requirements, staff agrees with the Applicant that only natural gas-burning technologies are feasible at this time.

NATURAL GAS BURNING TECHNOLOGIES

Fuel consumption is one of the most important economic factors in selecting an electric generator because fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant. In order to maintain reasonable costs to its customers, MID is strongly motivated to purchase fuel-efficient machinery.

There are two types of HRSG in consideration for the WGS2: drum-type and Once-Through Steam Generator (OTSG). From the perspective of energy resources, there is not a significant difference between the two types.

Capital cost is also important in selecting generating machinery. Recent progress in the development and improvement of gas turbine design, aided by the incorporation into these machines of technological advances made in the development of aircraft (jet) engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. Cost advantages of assembly-line manufacturing and worldwide sourcing of components and assembly has kept prices of these machines on a competitive basis. Thus, the power plant developer can purchase a turbine generator that not only offers higher efficiencies to maintain the lower fuel costs, but also at the same time achieves competitive per-kilowatt capital cost. It is therefore to be expected that MID has chosen one of the most efficient generating technologies available.

A further choice of alternatives involves the selection of gas turbine inlet air-cooling methods. The two commonly used techniques are the evaporative cooler and the chiller; both devices increase power output by cooling the gas turbine inlet air. An electric chiller offers greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but requires the use of a substantial inventory of ammonia. An evaporative cooler 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.

MID proposes to employ electric chilling to cool the WGS2 combustion turbine inlet air (MID 2001a, SPPE §2.4.2.1). Given the climate at the project site and the relative lack of clear superiority of one system over the other, staff agrees that the Applicant's approach will yield no significant adverse energy impacts. In conclusion, the selected project configuration (combined-cycle cogeneration) and generating equipment (LM6000 gas turbine) appear to represent the most efficient feasible combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

CUMULATIVE IMPACTS

Staff concludes that there are no cumulative impacts.

CONCLUSIONS

The WGS2, if constructed and operated as proposed, would generate from 58 MW to 80 MW of electric power with the maximum overall project fuel efficiency around 49.04 percent when fully duct firing. While it will consume substantial amounts of energy, the WGS2 will do so in the most efficient manner practicable. It will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. Staff therefore concludes that the WGS2 would present no significant adverse impacts upon energy resources.

PROPOSED CONDITIONS OF EXEMPTION

No Conditions of Exemption are proposed.

REFERENCES

- MID (Modesto Irrigation District). 2001a. Application for Small Power Plant Exemption, Woodland Generating Station 2 Project (01-SPPE-1). Submitted to the California Energy Commission, May 4, 2001.
- MID (Modesto Irrigation District). 2001b. Gas Supply Line Modifications Modesto Irrigation District Project (01-SPPE-1). Submitted to the California Energy Commission, May 25, 2001.

GEOLOGY AND PALEONTOLOGY

Testimony of Neal Mace

INTRODUCTION

The geology and paleontology section discusses the setting of the WGS2 Project and its potential impacts regarding geological hazards, and geological and paleontological resources. The purpose of this analysis is to verify that the applicable laws, ordinances, regulations, and standards (LORS) have been identified and that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to important geological and paleontological resources during project construction, operation, and closure. This section concludes with the staff's proposed monitoring and mitigation measures with respect to geological hazards and geological and paleontological resources with the inclusion of nine recommended Conditions of Exemption.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The applicable LORS are listed in the SPPE application, in Sections 8.14-2 and 8.15-2 (MID 2001a). A brief description of the LORS for geological hazards and resources, and paleontological resources follows.

FEDERAL

There are no federal LORS for geological hazards and resources. The WGS2 Project is not located on lands owned by the United States Government.

STATE AND LOCAL

The California Building Code (CBC) 1998 edition is based upon the Uniform Building Code (UBC), 1997 edition, which was published by the International Conference of Building Officials. The CBC is a series of standards that are used for investigation, design (Chapters 16 and 18) and construction (including grading and erosion control as found in Appendix Chapter 33). The CBC supplements the UBC's grading and construction ordinances and regulations.

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

- Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.
- Section (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.

- Section (X) (a) and (b) pose questions about the project's effect on mineral resources.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources (Society of Vertebrate Paleontologists, SVP 1994) are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1994 by a national organization of vertebrate paleontologists (the Society of Vertebrate Paleontologists).

SETTING

The WGS2 Project is a proposed 80 megawatt (MW) natural gas-fired, combined-cycle generation, combustion turbine, and condensing steam turbine facility to be located at the existing Woodland 1 Generating Facility. The proposed WGS2 facility will be located within a fenced storage yard of the existing Woodland 1.

WGS2 will consist of:

- An 80 MW nominal, natural gas-fired, combined-cycle generating facility consisting of one modern combustion turbine and a condensing steam turbine;
- Use of either a convention drum-type heat recovery steam generator (HRSG) or a once-through steam generator (OTSG);
- Expansion of the existing Woodland 1 switchyard by two new bays to accommodate WGS2;
- Approximately 1.2 miles of new 69 kV subtransmission line;
- Approximately 6 miles of system reinforcements to existing Pacific Gas and Electric Company (PG&E) natural gas supply lines in San Joaquin County; and
- Approximately 1 mile of new water line.

SITE GEOLOGY

WGS2 is located adjacent to the existing Woodland 1 facility in northern Modesto in Stanislaus County, California. The project site lies along the eastern side of the San Joaquin Valley in the Great Valley geomorphic province, located in an area consisting of low alluvial plains and fans characteristic of the Great Valley. The site is overlain in deposits derived from Quaternary alluvial fan and river flood plain deposits from fluvial systems originating from higher elevations to the east. Underlying geologic units at the site include the metamorphic and igneous basement complex, the consolidated marine deposits, the consolidated volcanic rocks, the continental deposits, and the unconsolidated older alluvium. No known faults occur at the site.

The proposed project is most affected by the younger geologic units, including recent river channel and flood plain deposits, the Quaternary Modesto, Riverbank, and Turlock Lake Formations. With the exception of the Turlock Formation, these

formations typically consist of sandy sediments with interbedded silt and clay layers. The Turlock formation consists of siltstone, sandstone, and conglomerate derived primarily from Sierran granitic and metamorphic rock.

As mapped by Davis and Hall (1959), Hall (1960), and Rogers (1966), the proposed WGS2 site, the right-of-way (ROW) for the electrical subtransmission line, and the existing PG&E feeder main are all located on the Late Pleistocene alluvium of the Modesto Formation. The Modesto Formation is composed of interbedded and poorly sorted sandstone and siltstone with lesser amounts of pebble to cobble conglomerate (MID 2001a). The Modesto Formation is approximately 80-feet thick at the WGS2 site (Davis and Hall 1059, Hall 1960) and along the PG&E Feeder Main ROW. At the PG&E ROW east of South Airport Way, the Modesto Formation is overlain by unnamed Quaternary alluvial deposits known as "Basin Deposits" in shallow depths. Basin Deposit sediments consist of fine-grained sands, silts, and clays deposited in the modern floodplain of the San Joaquin River.

The power plant expansion site and new linear facilities will predominantly lie within Dinuba fine sandy loam and Hanford sandy loam. Dinuba fine sandy loam has moderate permeability, low susceptibility to erosion, and has a soil reaction neutral to slightly acidic in surface; neutral to calcareous in subsurface. Hanford sandy loam has rapid permeability, low susceptibility to erosion, and has a soil reaction neutral to slightly acidic in surface; neutral in subsurface.

FAULTING AND SEISMICITY

Energy Commission staff reviewed the California Division of Mines and Geology (CDMG) publication "Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions," dated 1994 (CDMG 1994). No active or potentially active faults are known to cross the power plant footprint or the subtransmission line and pipeline corridors. The project is located within Seismic Zone 3 as delineated on Figure 16-2 of the 1998 edition of the CBC. The closest known active fault is the Vernalis fault, which is located approximately 21 kilometers (km) northwest of the project site. Other major faults that have historically produced earthquakes of the greatest magnitude in central California include the Calaveras, Hayward, and San Andreas faults in the Coast Ranges; the Greenville and Midland faults on the west side of the Great Valley; and the Sierra Nevada and Owens Valley faults east of the Sierra Nevada mountains (MID 2001a). The fault that is likely to cause the greatest ground shaking at the site is the Great Valley fault, located approximately 26 km west of the project site. The Great Valley fault is a blind thrust fault capable of producing a Maximum Credible Earthquake (MCE) of Magnitude (Mw) 6.7. Peak horizontal ground acceleration at the site due to a MCE on the Great Valley fault is estimated 0.2g. This value is generally consistent with the California Division of Mines and Geology (CDMG) Map Sheet 48, which predicts a peak ground acceleration with a 10 percent chance of exceedance in 50 years of approximately 0.2g for the project area.

On May 18, 2001, Energy Commission staff visited the project location and did not observe any evidence of surface faulting. The potential of surface rupture on a fault

at the power plant footprint is considered to be very low, since no active faults are known to have ruptured the ground surface of the project site.

LIQUEFACTION, SUBSIDENCE, HYDROCOMPACTION, AND EXPANSIVE SOILS

Liquefaction is a condition in which a cohesionless soil loses its shear strength due to a sudden increase in pore water pressure. The soils most prone to liquefaction during earthquakes are fine-grained, poorly graded, saturated, loose sands and silts.

Soils boring logs provided by the Applicant indicate that the depth to groundwater beneath the proposed site generally varies from approximately 60 to 70 feet below existing grade (Kleinfelder, 1992). Soils beneath the site typically contain layers and lenses of medium dense to dense sand, silty sand, sandy silt, and hard silty clay. Peak horizontal ground acceleration at the power plant expansion site and linear facilities is expected to be approximately 0.2g. Dynamic compaction and the potential for liquefaction would be low due to the relatively dense nature of the sandy soils, the low anticipated peak ground acceleration, and the low groundwater table.

One of the most serious liquefaction hazards results when a competent soil overlies deeper liquefiable soil layers. Liquefaction of the deeper layers may result in substantial lateral spreading or sliding of the upper competent soil along the liquefied layer. Lateral spreading can occur along slopes as shallow as two percent, extend several hundred feet back from a slope, and produce displacements of tens of feet if soil conditions are favorable and earthquake shaking is of sufficient duration. Lateral spreading is particularly likely in the vicinity of unlined stream and river channels or other sloping locations. The potential for liquefaction induced lateral spreading within the soils beneath most of the site is considered low because of the low surface gradients and topographic relief at the project site and the depth to the groundwater table.

Hydrocompaction is the process of the loss of soil volume upon the application of water. The soils at the site are dense enough that hydrocompaction is not considered to be a significant problem.

Soils that contain a high percentage of expansive clay minerals are prone to expansion, if subjected to an increase in water content. Expansive soils are usually measured with an index test such as the expansive index potential. In order for a soil to be a candidate for testing, the soil must have high clay content and the clay must have a high shrink-swell potential and a high plasticity index. The Dinuba and Hanford sandy loams that occur within the project site and linear facilities are not prone to significant soil expansion due to their low clay content. Two soil mapping units along the gas line reinforcement alignment, Merritt silty clay loam and Trahern clay loam, have moderate to high shrink-swell potentials. However, these materials will be excavated during construction activities and replaced with suitable pipe bedding material.

EROSION

None of the soils types anticipated to be encountered during construction of the project are highly susceptible to erosion. Additionally, construction activities will employ mitigation and sedimentation/erosion controls consistent with construction best management practices (BMPs) (MID 2001a, p. 8.9-10 and 8.9-11).

LANDSLIDES

Landsliding potential at the power plant site is considered to be low, since the project is located on an alluvial plain that slopes between 1 and 2 percent, and there are no slopes adjacent to the site.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

There are no known geological or mineralogical resources located at or immediately adjacent to the proposed expansion site or the subtransmission line and pipeline corridors.

A published and unpublished literature review was conducted by the Applicant supplemented with archival searches conducted at the University of California Museum of Paleontology (UCMP) in Berkeley, California. In addition, the Applicant consulted with professors at Modesto Junior College (Dr. Garry Hayes) and California State University Stanislaus (Dr. Abbas Kimyai), and the staff of the Valley Museum in Modesto. A field survey was also conducted March 10, 2001 by Dr. Lanny H. Fisk to visually identify and document the presence of sediments suitable for containing fossil remains and the presence of and previously unrecorded fossil sites.

The literature review and UCMP archival search documented no previously recorded fossil sites within the footprint of the proposed WGS2 site or the corridors of the electrical subtransmission line and natural gas pipeline reinforcements. The review did show that a number of fossil sites were documented as occurring in the Modesto Formation in the vicinity of these facilities. Additionally, the field survey conducted by Dr. Fisk revealed fossil remains at a previously unrecorded fossil site in the proposed project site vicinity.

The UCMP archival search also indicated that fossil remains of land mammals have also been found at localities in younger, unnamed Quaternary alluvium (MID 2001a, pgs. 8.15-10).

The paleontological inventory suggests that scientifically important fossil remains may be uncovered by excavation associated with construction of the project. Clearing, grubbing, and grading at the power plant site associated with construction of the WGS2 project are considered to present a low potential impact to paleontological resources. However, deeper excavation associated with foundations, subtransmission lines, and new pipeline segments may significantly impact paleontological resources. The adoption and implementation of the proposed Conditions of Exemption for paleontological resources should mitigate any potential

impacts to paleontological resources, should such resources be encountered during construction of this project.

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant	No Impact
GEOLOGY - Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii) Strong seismic ground shaking?		X		
iii) Seismic-related ground failure, including liquefaction?				X
iv) Landslides?				X
b) Result in substantial soil erosion?				X
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse the loss of topsoil?				X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X
MINERAL RESOURCES - Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X
PALEONTOLOGICAL RESOURCES - Would the project:				
a) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		

DISCUSSION OF IMPACTS

GEOLOGY AND SOILS

A. Risk of Loss, Injury, or Death from Geologic Hazards

I. RUPTURE OF KNOWN EARTHQUAKE FAULT: NO IMPACT

The proposed power plant expansion and related linear facilities are not located on a fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist.

II. STRONG SEISMIC GROUND SHAKING: LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

Design and construct the project to conform to the Uniform Building Code (1997) requirements for Seismic Zone 3 and a peak ground acceleration value of up to 0.2g.

III. SEISMIC GROUND FAILURE OR LIQUEFACTION: NO IMPACT

The relatively dense nature of the sandy soils, the low anticipated peak ground acceleration, and the low groundwater table indicate that the potential for liquefaction and dynamic compaction is a less than significant impact.

IV. LANDSLIDES: NO IMPACT

Since the project facilities are located on an alluvial plain that slopes between 1 and 2 percent, the landslide potential is not considered to be a potential impact.

B. Soil Erosion: No Impact

Soils have low susceptibility to erosion and construction activities will employ soil erosion mitigation measures.

C. Unstable Soils: No Impact

The project facilities are not located on a geologic unit that is unstable or would become unstable as a result of the project.

D. Expansive Soils: No Impact

The Dinuba and Hanford sandy loams that occur beneath the power plant site and along the linear facility alignments are not considered being prone to significant soil expansion due to their low clay content. Two soil-mapping units along the gas line reinforcement alignment, Merritt silty clay loam and Trahern clay loam, have moderate to high shrink-swell potentials. However, these materials will be excavated during construction activities and replaced with suitable pipe bedding material.

E. Wastewater Concerns: No Impact

The project will be served by the local sewer system.

MINERAL RESOURCES

A. Loss of Mineral Resources: No Impact

There are no known geological or mineralogical resources located at or immediately adjacent to the proposed expansion site or the subtransmission line and pipeline corridors.

B. Loss of Identified Mineral Resource Recovery Sites: No Impact

There are no known geological or mineralogical resources located at or immediately adjacent to the proposed expansion site or the subtransmission line and pipeline corridors.

PALEONTOLOGY

A. Destruction of Paleontological Resource or Geologic Feature: Less Than Significant With Mitigation Incorporated

Based upon the literature and archives search, field surveys, and the preliminary geotechnical investigation for the project, the Applicant has proposed monitoring and mitigation measures to be followed during the construction of the power plant and linear facilities. Energy Commission staff agrees with the Applicant that the scientific value of vertebrate fossils encountered during construction of the power plant and related features will be recovered with the implemented mitigation plan.

CUMULATIVE IMPACTS

It is Energy Commission staff's opinion that the potential for significant adverse cumulative impacts on paleontological resources or geological resources is unlikely, if the WGS2 and related project components are constructed according to the proposed Conditions of Exemption. This opinion is based on the fact that implemented mitigation measures would effectively recover fossils discovered during construction.

CONCLUSION AND RECOMMENDATIONS

The proposed Conditions of Exemption are to allow the Energy Commission Compliance Project Manager (CPM) and the Applicant to adopt a compliance monitoring scheme that will ensure compliance with LORS applicable to geological hazards and geological and paleontological resources for the project.

The Applicant will likely be able to comply with applicable LORS. With implementation of the noted mitigation measures, the project should have no adverse impact with respect to geological and paleontological resources. Staff proposes to ensure compliance with applicable LORS for geological hazards and geological and paleontological resources with the adoption of the recommended Conditions of Exemption listed below.

PROPOSED CONDITIONS OF EXEMPTION

GEO-1 Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the 1998 edition of the California Building Code (CBC) Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the Compliance Project Manager (CPM). A geotechnical engineer may also perform the functions of the engineering geologist, if that person has the appropriate California license.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the Chief Building Official (CBO)) prior to the start of construction, the project owner shall submit to the CPM, for approval, the name(s) and license number(s) of the certified engineering geologist(s) or geotechnical engineer(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM will approve or disapprove of the engineering geologist(s) or geotechnical engineer(s) and will notify the project owner of their findings within 15 days of receipt of the submittal. If the engineering geologist(s) or geotechnical engineer(s) are subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual(s) to the CPM. The CPM will notify the project owner of their approval or disapproval of the engineering geologist(s) or geotechnical engineer(s) within 15 days of receipt of the notice of personnel change.

GEO-2 The assigned engineering geologist(s) or geotechnical engineer(s) shall carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4- Engineered Grading Requirement, and Section 3318.1 – Final Reports. Those duties are:

1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.
2. Monitor geologic conditions during construction.
3. Prepare the Final Engineering Geology Report.

Protocol: The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions, including the liquefaction potential and foundation conditions, on the proposed development, and an opinion on the adequacy of the site for the intended use as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1,

shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated in the approved grading plan. The engineering geologist shall also submit a statement that, to the best of his or her knowledge, the work within his or her area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

Verification: (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications, (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318- Completion of Work, to the CBO, and to the CPM on request.

PAL-1 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designated paleontological resource specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resource specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resource specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological resource management; and at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

The statement of qualifications shall include a list of specific projects the specialist has worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resource specialist do not satisfy the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated, paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource specialist by submitting the name and qualifications of the proposed replacement to the CPM at least ten (10) days prior to the termination or release of the preceding designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of their proposed replacement specialist.

Verification: At least thirty (30) days prior to the start of construction, the project owner shall submit the name, resume, and the availability for their designated paleontological resource specialist to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontological resource specialist.

At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to the start of project construction, the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed, throughout project construction.

In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists (SVP 1994), the Paleontological Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

- A discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation;
- Identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;

- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring;
- An εξειδικευμενο that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;
- A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
- Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and
- Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.

Verification: At least thirty (30) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resource specialist shall prepare and conduct CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Protocol: The paleontological training program shall discuss the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities. The training program shall be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least (30) thirty days prior to the start of project construction, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program and the set of reporting procedures the workers are to follow if paleontological resources are encountered during project construction.

If the employee training program and set of procedures are not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes, before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

PAL-4 The designated paleontological resource specialist or designee shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified. If the designated paleontological resource specialist determines that full-time monitoring is not necessary in certain portions of the project area, the designated specialist shall notify the project owner.

Verification: The project owner shall include in the Monthly Compliance Reports a summary of paleontological activities conducted by the designated paleontological resource specialist.

PAL-5 The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-6 The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report shall include, but not be limited to, a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated.

Verification: The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resource specialist within 90 days following completion of the analysis of the recovered fossil materials.

PAL-7 The project owner shall include in the facility closure plan a description regarding the facility closure activity's potential to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM twelve months prior to closure of the facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for facility closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

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HAZARDOUS MATERIALS

Testimony of Alvin Greenberg, Ph.D.

INTRODUCTION

This section provides a discussion of staff's evaluation of the potential impacts of the proposed WGS2 associated with the handling of hazardous materials. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts attributed to materials use or hazardous conditions during project construction, operation and closure. Energy Commission staff has determined that all CEQA checklist items for hazardous materials are either "less than significant impact" or "no impact." A brief hazards and hazardous materials overview of the project is provided, as are comments regarding selected CEQA checklist items with respect to hazards and hazardous materials. The section concludes with the staff's proposed monitoring and mitigation measures with respect to hazards and hazardous materials, with the inclusion of four Conditions of Exemption.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

A framework, based on environmental laws, ordinances, regulations and standards (LORS), exists to reduce risks of accidents and reduce routine hazards. The following federal, state, and local laws generally apply to the protection of public health and the environment. Their provisions have established the basis for staff's determination regarding the significance and acceptability of the WGS2 Project.

FEDERAL

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III and Clean Air Act of 1990 established a nationwide emergency planning and response program, and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The Act (codified in 40 C.F.R., § 68.110 et seq.) requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility through preparation of Risk Management Plans. The requirements of these Acts are reflected in the California Health and Safety Code, section 25531 et seq.

STATE

CALIFORNIA HEALTH AND SAFETY CODE, SECTION 25534

The California Health and Safety Code, section 25534, directs facility owners who store or handle acutely hazardous materials in reportable quantities, to develop a Risk Management Plan (RMP) and to submit it to appropriate local authorities, the United States Environmental Protection Agency (USEPA), and the designated local administering agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an

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

CALIFORNIA HEALTH AND SAFETY CODE, SECTION 41700

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 GOVERNMENT CODE, SECTION 65850.2

California Government Code, section 65850.2, restricts the issuance of an occupancy permit to any new facility involving the handling of acutely hazardous materials until the facility has submitted an RMP to the administering agency with jurisdiction over the facility.

TITLE 8, CALIFORNIA CODE OF REGULATIONS, SECTION 5189

Title 8, California Code of Regulations, section 5189, requires the owners of facilities that handle very large quantities of hazardous materials to develop and implement effective Process Safety Management (PSM) plans to insure safe handling of such materials. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process. Facilities that trigger PSM requirements are also automatically in the most stringent RMP program level.

LOCAL

UNIFORM FIRE CODE

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. The latest revision to Article 80 was in 1997 (UFC, 1997). These articles contain minimum setback requirements for the outdoor storage of ammonia.

CALIFORNIA BUILDING CODE

The California Building Code also contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit.

SETTING

The proposed WGS2 Project will be located on the property of MID's existing Woodland 1 Generating Station. The primary fuel source for the WGS2 Project is natural gas. Selective Catalytic Reduction (SCR) is to be used to reduce nitrogen oxide (NO_x) emissions from the combustion of natural gas in the combustion turbine. Aqueous ammonia will be used in the SCR process to convert the NO_x into

nitrogen and water vapor. The current aqueous ammonia storage system at the existing cogeneration plant will be used by both the new and existing facilities. A number of other hazardous chemicals will also be used at the new WGS2 facility in small quantities.

Safeguards that are already in place at the existing Woodland 1 facility would be incorporated into the proposed WGS2. Additional proposed safeguards and measures to greatly reduce the opportunity for, or the extent of, exposure to hazardous materials or other hazards would supplement the existing measures.

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
HAZARDS AND HAZARDOUS MATERIALS – Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport or use of hazardous materials?			X	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
HAZARDS AND HAZARDOUS MATERIALS – Would the project:				
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X

DISCUSSION OF IMPACTS

The basis for the impact determinations in the checklist is discussed below.

A. Transport or Use of Hazardous Materials: Less Than Significant Impact

A variety of hazardous materials are proposed for storage and use during the construction of the project and for routine plant operation and maintenance. A list of the hazardous materials to be used during operation of the facility are included the SPPE application in Tables 8.12-2 and 8.12-3. Two of these materials, aqueous ammonia and natural gas, are addressed below.

The hazard characteristics of ammonia and natural gas and their proposed use in substantial amounts during the operation of the plant pose the principal risk of off-site impacts. The potential threats from the other hazardous materials are not as significant as they are to be stored, handled or used for routine purposes in relatively smaller quantities at the facility and also have lower toxicity and/or environmental mobilities. The Department of Toxic Substances Control (DTSC) has submitted a letter to the Energy Commission that requests the addition of a Condition of Exemption, concerning the storage, treatment, or disposal of hazardous wastes, which has been incorporated as Haz-4 (DTSC, 2001).

AQUEOUS AMMONIA

Selective Catalytic Reduction (SCR) is proposed to reduce nitrogen oxide (NO_x) emissions to meet the plant's air quality permit requirements. Aqueous ammonia would be made to react with a catalyst to convert the NO_x into inert water vapor and nitrogen in the SCR process. The aqueous ammonia proposed for use is a solution 29.5% ammonia and 70.5% water. Solutions containing more than 20% ammonia are considered regulated materials exceeding reportable quantities defined in the California Health & Safety Code section 25532(j). The proposed use of aqueous ammonia significantly reduces the risks that would otherwise be associated with use of the more hazardous anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the more lethal anhydrous form, which is stored as a liquefied gas at elevated pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release that can rapidly introduce large quantities of the material to the ambient air, where it can be transported in the atmosphere and result in high down-wind concentrations. Spills associated with the aqueous form are also much easier to contain than those associated with the anhydrous form. In addition,

relatively slow mass transfer from the free surface of the spilled aqueous solution limits emissions from a spill of aqueous ammonia.

Aqueous ammonia is typically transported and handled safely and without incident. However, mishandling can result in impacts on public health. A significant number of modern power plants routinely use aqueous ammonia and the Energy Commission has licensed many such plants. Much of the risks associated with using ammonia are already reduced through MID's proposed use of the aqueous form of ammonia. Project compliance with LORS makes it unlikely that the use of aqueous ammonia will result in a significant threat to public health and the environment.

The transportation and delivery of hazardous materials including aqueous ammonia, particularly on California freeways, is routinely regulated and controlled by various federal and state laws, ordinances, regulations, and standards as discussed in the section titled Traffic and Transportation. There are a number of transportation accident studies that support the fact that such incidents and corresponding chances are highly dependent on the type of roadway and surroundings. It has been reported that the truck accident frequency is highest for an undivided multilane road at 5.44 accidents per million miles compared to 0.93 accidents per million miles for a freeway in rural California (Davies et al., 1992). Similarly, the accident rate in urban California is highest for a multilane that is undivided at 13.02 accidents per million miles in comparison to 1.59 accidents per million miles on a freeway. A recent study went even further by concluding that releases of hazardous materials on freeways rarely play a role in deaths or injuries (FMCSA, 2000). It is therefore reasonable to say that the likelihood of an accident involving a release of ammonia is probably higher on local roads than on freeways. This is supported in a report that observed that accident rates are typically much higher for two-lane rural roads compared to multilane highways (USDOT, 1998).

Staff has evaluated the proposed route to be used for shipment of hazardous materials to the facility and concludes that the risk to the public from transportation of aqueous ammonia is not significant. Most of the transportation route is on State Route (SR) 99. Because the facility is located less than 1 mile from SR 99 it is very unlikely that a serious release would occur in the project area.

Staff therefore concludes that any potential adverse impacts from the transport of aqueous ammonia can be easily limited to a level of insignificance through the Applicant's conformance to applicable standards and laws, reinforced by staff's proposed Conditions of Exemption.

NATURAL GAS

The primary fuel source proposed project is natural gas. It poses a fire and/or explosion risk as a result of its flammability. While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion from natural gas can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) Code

85A requires: 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems (NFPA 1987). These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures will require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture.

The facility will also require the installation of two new natural gas distribution pipelines that could result in accidental release of natural gas. In order to detect an accidental release of natural gas, both PG&E's main pipeline and the gas in the proposed pipeline will be odorized. The new pipeline segments will also be equipped with strategically located pressure transmitters, which will sound an alarm at the PG&E control center if there is a drop in pipeline pressure. PG&E will prepare an operations and maintenance plan that addresses both normal procedures and conditions, and any upset or abnormal conditions that could occur. The pipeline segments will be under a continuous cathodic protection system and PG&E will perform periodic cathodic protection surveys. There will be markers to identify the pipeline locations, as well as a posting of the toll-free number to call prior to any excavation that may occur around the pipeline

The proposed new pipeline segments will be designed, constructed, and operated in accordance with national safety codes and the safety standards for new gas pipelines stated in the California Public Utility Commission's General Order (G.O.) 112-E.

It is staff's belief that design and operation of these pipelines in accordance with applicable standards will result in an insignificant risk of impact to the public as a result accidental release of natural gas from the new pipelines.

B. Accidental Release of Hazardous Materials: Less Than Significant Impact

Aqueous ammonia is being proposed for use in controlling NO_x emissions created during the combustion of natural gas at the facility. The Applicant is proposing to use the current ammonia storage system at the existing Woodland 1 power plant. Staff does not believe that the additional piping for the new plant could result in a significant impact even in the event of a worst case accidental release.

Compliance with applicable LORS, existing safeguards, and staff's Conditions of Exemption will greatly reduce the opportunity for, or extent of, exposure to ammonia vapors by the public.

C. Emission or Handling Hazardous Substances Near a School: No Impact

There are no known schools within a ¼ mile radius of proposed project.

D. Site Listed as Hazardous: No Impact

The WGS2 project is not located on a hazardous materials site.

E. Airport Hazard Area: No Impact

The WGS2 project is not located within an airport use plan.

F. Private Airstrip Hazard Area: No Impact

There are no private airstrips in the vicinity of the project. Therefore, there are no impacts anticipated from a private airstrip.

G. Impair Emergency Response Plan: No Impact

It appears that the construction and operation of the project would improve upon the reliability of the local power system and therefore benefit the local emergency response capabilities. No interference with emergency response plans or emergency evacuation plans is anticipated.

H. Exposure to Wildland Fires: No Impact

The proposed site would be mostly paved and hence clear of substantial vegetation. The immediate area around the site would be landscaped with limited brush, shrubs, or trees and maintained and irrigated so as not to colonize the site.

Fire hazard from vegetation is not a concern since those trees, brush, or grass surrounding the WGS2 site would be maintained and irrigated on a regular basis.

CONCLUSIONS

By incorporating the appropriate Conditions of Exemption, the routine transport to and use of hazardous materials at the WGS2 project site will not result in significant impacts to the public or the environment.

PROPOSED CONDITIONS OF EXEMPTION

HAZ-1 All aqueous ammonia deliveries to the facility shall be in tanker trucks that meet or exceed the US Department of Transportation requirements for hazardous materials as established in the Code of Federal Regulations No. 49 Parts 171-180.

Verification: The project owner shall include in its Monthly Compliance Reports, copies of all regulatory permits/licenses acquired by the project owner and/or subcontractors concerning the transport of aqueous ammonia and other hazardous materials.

HAZ-2 The project owner shall not use any hazardous material in reportable quantities, as specified in Title 40, CFR part 355, Subpart J, section 355.50, not listed in Appendix A, unless approved in advance by the CPM.

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

HAZ-3 The project owner shall provide a revised and updated Risk Management Plan (RMP) to the Stanislaus County Department of Environmental Resources (SCDER) and the CPM for review at the time the RMP is

submitted to the U.S. Environmental Protection Agency (USEPA). The project owner shall ensure that the final plan reflects all recommendations of the SCDER and the CPM. A copy of the final plan, reflecting all comments, shall be provided to the SCDER and the CPM. The project owner shall also develop and implement a safety management plan for delivery of ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist.

Verification: At least sixty (60) days prior to the first WGS2 plant start-up test, the project owner shall provide the final RMP listed above to the CPM for approval. The safety management plan shall also be provided to the CPM for review and approval at least 60 days prior to the first WGS2 plant start-up test.

HAZ-4 The project owner shall contact the Department of Toxic Substances Control (DTSC) to obtain a permit for hazardous wastes that are, or will be:
(a) stored in tanks or containers for more than ninety days; (b) treated on-site; or (c) disposed of on-site. The project owner shall contact DTSC to initiate pre-application discussions and determine the permitting process applicable to the facility.

Verification: The project owner shall provide to the CPM, in its Monthly Compliance Report, copies of all permits mandated by the DTSC acquired by the project owner and/or subcontractors concerning the storage, treatment, or disposal of hazardous wastes.

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WATER RESOURCES

Testimony of Kenneth M. Schwarz, Ph.D.

INTRODUCTION

This analysis examines water resources issues related to the proposed WGS2. Potential impacts to water resources are evaluated in respect to significance thresholds established in the CEQA Environmental Checklist. The proposed WGS2 project specifically involves the following topics of concern:

- How the project's demand for water affect water supplies for the City of Modesto;
- Whether construction or operation will lead to significant wind or water erosion and sedimentation;
- Whether project construction or operation will lead to degradation of surface or groundwater quality; and
- Whether the project will comply with all applicable laws, ordinances, regulations and standards.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

CLEAN WATER ACT

The Clean Water Act (33 USC Section 1257 *et seq.*) requires states to set standards to protect water quality. Point source discharges to surface water are regulated by this act through requirements set forth in a National Pollutant Discharge Elimination System (NPDES) Permit. Stormwater discharges during construction and operation of a facility also fall under this act and must be addressed through either a project-specific or general NPDES permit. In California, the nine Regional Water Quality Control Boards (RWQCB) administer the requirements of the Clean Water Act. In the Modesto project area, the Central Valley Regional Water Quality Control Board (CVRWQCB) administers permitting. Section 404 of the act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams, and wetlands. The U.S. Army Corps of Engineers (USACOE) issues site-specific or general (nationwide) permits for such discharges.

STATE

PORTER-COLOGNE WATER QUALITY CONTROL ACT

The Porter-Cologne Water Quality Control Act of 1967, Water Code Section 13000 *et seq.*, requires the State Water Resources Control Board and the nine regional RWQCBs to adopt water quality criteria to protect the State's waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. The criteria for the WGS2 project area

are contained in the Central Valley Region Water Quality Control Plan. This plan sets numerical and/or narrative water quality standards controlling the discharge of wastes with elevated temperature to the State's waters. These standards are applied to the proposed project through the Waste Discharge Requirements (WDRs) permit.

- Section 13552.6 of the Water Code specifically identifies that the use of potable domestic water for cooling towers, if suitable recycled water is available, is an unreasonable use of water. The availability of recycled water is based upon a number of criteria, which must be taken into account by the SWRCB. These criteria are that: the quality and quantity of the reclaimed water are suitable for the use; the cost is reasonable; the use is not detrimental to public health; the use will not impact downstream users or biological resources; and the use will not degrade water quality.
- Section 13552.8 of the Water Code states that any public agency may require the use of recycled water in cooling towers if certain criteria are met. These criteria include that: recycled water is available and meets the requirements set forth in Section 13550; the use does not adversely affect any existing water right; and if there is public exposure to cooling tower mist using recycled water, appropriate mitigation or control is necessary.

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principal policy of the State Board, which addresses the specific siting of energy facilities, is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (adopted by the Board on June 19, 1976 by Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. This SWRCB policy requires that power plant cooling water should come from (in order of priority): wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland waste waters of low total dissolved solids, and other inland waters. This policy goes on to address cooling water discharge prohibitions.

Section 401 of the Clean Water Act provides for State Certification of federal permits allowing discharge of dredged or fill material into waters of the United States. These certifications are issued by the RWQCBs. For this project, any 401 certification will be handled with the Waste Discharge Requirements (WDR) permit.

THE SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (PROPOSITION 65)

The Safe Drinking Water and Toxic Enforcement Act of 1986 (Health and Safety Code Section 25249.5 et seq.), prohibits the discharge or release of chemicals known to cause cancer or reproductive toxicity into drinking water sources.

LOCAL

CITY OF MODESTO

City of Modesto ordinances specify requirements for stormwater discharges and discharges to sewers. Ordinance No. 3137-CS requires a permit for discharging wastewater to the City's Water Quality Control Facility system to prohibit discharges that could adversely affect the sewage treatment capacity of surface waters. Ordinance No. 3138-CS specifies requirements for stormwater plans including implementation of a Storm Water Pollution Prevention Plan (SWPPP) to prevent hazardous material spills, development of BMPs, and Grading and Erosion Control Plans. In addition, policies identified in the City of Modesto General Plan (1995) address water supply, wastewater discharges, and stormwater discharges. The City of Modesto has requirements for a Salt Reduction Work Plan in its NPDES permit renewal, which will affect the proposed project's ability to discharge to the City sewer. The Applicant has selected a water supply that will be consistent with this policy.

SETTING

The WGS2 project site is located in an industrial zoned area of Modesto whereby the proposed plant upgrade will occur within the existing paved and fenced area of the current Woodland 1 plant. Runoff generated by the proposed project will be routed to the existing stormwater basin at the northwestern edge of the Woodland 1 plant. In addition to the existing stormwater basin, the existing water treatment system and storage tanks for raw and demineralized water for the existing Woodland 1 plant will be used for the WGS2 plant.

REGIONAL WATER SUPPLY

The municipal and agricultural water needs of the Modesto region are supplied by both groundwater and surface water.

GROUNDWATER

The groundwater basin underlying the Modesto area is defined by the San Joaquin River to the west, the Stanislaus River to the north, the Sierra Nevada foothills to the east, and the Tuolumne River to the south. This basin has a surface area of approximately 360 square miles (230,000 acres). Boundaries of groundwater basins may change seasonally or annually as hydrologic conditions vary. Rivers may variably contribute or receive water from their underlying aquifers, and this relationship can alter the boundaries between basins. Several local groundwater units occur within the larger basin. Some local units are divided into shallow and deeper levels according to the presence of confining strata such as the Corcoran Clay.

Depth to groundwater ranges from 5 to 100 feet in the region, and generally flows perpendicular to surface contours southwesterly from the Sierra Nevada towards the San Joaquin Valley. Groundwater withdrawal has created a large cone of depression in central Modesto and this influences local flow patterns. Groundwater

recharge occurs in the agricultural areas northeast and west of Modesto and along some riverbeds. Ground water levels fluctuate seasonally depending upon precipitation, runoff, and snowmelt conditions, as well as pumping withdrawals. In much of the region, groundwater elevations decreased between 1984 and 1994. Since 1994, groundwater levels have recovered significantly possibly due to strong runoff and snowmelt seasons. Alternatively, groundwater levels may be recovering as a result of more balanced use of surface and groundwater supplies (Meleg, B, Associate Civil Engineer, City of Modesto Personal Comment, MID 2001a).

Water Resources Table 1, taken from MID (2001a) and based upon results from HCI (1993), presents a groundwater budget for the Modesto area. This budget suggests that, at the time the model was developed, groundwater outflow exceeded inflow by about 2,000 acre-feet per year (AFY). Cities and the incorporated communities in the MID service area currently use groundwater to meet approximately half of the municipal and industrial demands. As noted above, the City, along with MID, has developed a Groundwater Management Plan and are using surface water to stabilize the groundwater overdraft situation.

**WATER RESOURCES: Table 1
Summary of Water Budget (1952-1991) from HCI Model (1993)**

Water Budget Component	AFY
Deep Percolation and Canal Seepage	226,000
Stream Bed Seepage	17,000
Modesto Reservoir Seepage	40,000
Groundwater Inflow	2,000
Total	285,000
Outflow	
Irrigation and Drainage Well Pumping	100,000
Municipal Pumping	37,000
Discharge to Streams	150,000
Total	287,000

Source: MID 2000a, Table 8.13-3; Hydrologic Consultants, Inc. (HCI) Model (1993) in MID 1996.

SURFACE WATER

There are no surface water bodies on, or immediately adjacent, to the WGS2 project site. The nearest surface water feature to the WGS2 site is an MID canal (Lateral 4) from the Modesto Reservoir, located about one mile southeast of the site. Regarding the proposed new gas line segments which extend from the Ripon area southward towards Modesto, these pipelines will cross 2 local irrigation/drainage ditches as indicated in Figures 8 and 9 in the Project Description. Horizontal Directional Drilling (HDD) practices shall be used to bore the gas lines beneath the existing ditches.

As described above, all stormwater runoff from the WGS2 project site is conveyed to an on-site detention basin that allows runoff to infiltrate directly to the soil. There are no off-site discharges of stormwater. Average annual precipitation in Modesto is about 12 inches, with most rainfall occurring during the winter and spring months between January and May. April is the wettest month with a long-term average of 2.3 inches of precipitation (MID 2001a, Table 8.13-2).

Significant natural water bodies in the WGS2 project area include the Stanislaus River (approximately 6 miles to the north), the Tuolumne River (2 miles to the south), and the San Joaquin River (8 miles to the west). These distances are measured from the WGS2 site whereby distances from the proposed gas line reinforcements are different as indicated in the map (Figures 8 and 9). Dry Creek, an intermittent tributary to the Tuolumne River, is about 2 miles southeast of the project site and collects surface runoff for much of the Modesto area. Dry Creek is often dry in the summer months, but during the winter this creek can carry significant flows (4,120 cfs, DWR 1994). The Dry Creek corridor is the nearest flood zone to the project site. The mapped FEMA floodplain for Dry Creek and the Tuolumne River are shown in Figure 8-13.2 (SPPE application) as recorded in the City of Modesto General Plan. Neither the WGS2 project area nor connecting project linears are within the estimated 100-year flood zone.

CITY OF MODESTO WATER SUPPLY

The current Modesto water supply is a conjunctive use program that uses both surface water and groundwater. The City uses predominantly surface water in winter and a blend of surface and groundwater during the summer season. Surface water treatment capacity is currently 30 MGD, about 33,600 acre-feet per year (AFY), and the City can obtain an additional 40,000 AFY from groundwater without creating overdraft (City of Modesto, 1995). The City expects to expand water treatment capacity to 60 MGD surface by approximately 2005. After expansion, this water project will be able to deliver 67,200 AFY (M. Gilton, City of Modesto, 1995).

Prior to 1995, the City of Modesto obtained its water supply entirely from groundwater from municipally operated wells. Declining water quality (total dissolved solids and nitrates) from some wells led the City to team with MID to develop and augment water supplies by constructing the Modesto Regional Water Treatment Plant (MRWTP) and distribution system. This system diverts MID water (pre-1914 water rights) from the Tuolumne River at the La Grange Dam (40 miles east of the WGS2), to the Modesto Reservoir (18 miles east of WGS2). Modesto Reservoir has a capacity of 29,000 acre-feet.

The City is also developing a plan to supplement water supplies with 30,000 AFY of tertiary treated sanitary sewer effluent. When this additional water source becomes available it would support irrigation needs currently met by potable supply and help recharge groundwater. The City has not yet implemented these additional water recycling programs because existing water supplies are sufficient to meet the current and projected needs for the foreseeable future (B. Meleg, 2001).

The municipal water supply currently provides water to 180,000-200,000 people in the Modesto area and industries. Current City water demands are estimated at 60,000 AFY (MID 1996), which is met by about 50% groundwater and 50% surface water. Surface and groundwater supplies have the capacity to serve a population of approximately 290,000 persons (City of Modesto, 1995).

WATER SUPPLY AND USE

As described above in the project description, the proposed WGS2 project will use treated surface water from the Modesto Regional Water Treatment Plant (MRWTP) for cooling, process makeup, and domestic water needs (MID 2001a, Table 2.4-3). Water would be supplied to the plant from an existing water main located adjacent to MID's Lateral 4 canal, near the corner of 9th Street and Kansas Avenue. This water main is about 1 mile southeast of the project site. This water would be conveyed to the site via a new 10-inch pipeline that would be constructed in or adjacent to Kansas Avenue and Graphics Avenue (MID 2001a, Figure 2-1). The quality of the proposed municipal water supply is excellent; it has low mineral content and few contaminants. The constituents that most control power plant water use are silica (estimated at 10 mg/L) and total dissolved solids (TDS) in the discharge.

SPPE Application Tables 8.13-4 and 8.13-5 (MID, 2001a) show the monthly water supply requirements and discharge conditions for the proposed WGS2 plant. The low season and high season water demand is estimated at 0.3 and 1 MGD respectively. The Applicant has submitted this estimated water need to the City of Modesto for review. The City has agreed that the water is available and has agreed to serve it at the location and in the quantities requested. The "Will Serve" letter is included in Appendix 8.13-1 of the SPPE application. WGS2 would use a maximum of 1 MGD during summer months and 0.3 MGD during winter months. This represents less than 2 percent of the estimated 60 MGD City of Modesto surface water supply after expansion of the treatment facility in 2005. The City of Modesto revises their water supply plan approximately every 5 years, but does not regard the WGS2 demands as significant at this time (B. Meleg, 2001). According to Modesto officials, there are ample opportunities to further develop conjunctive use or recycled water uses in the future, should water supply become a limiting concern (MID2001DRes1, Data Response No. 44).

SWRCB Resolution 75-58 requires that power plant cooling water should come from (in order of priority): wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland waste waters of low total dissolved solids, or other inland waters. Such water supply alternatives were evaluated for the proposed project (SPPE application, Section 9) but were considered infeasible.

Ocean water and wastewater discharges to the ocean are locally unavailable. Irrigation return flows are not available year-round; are gathered 9 miles to the west of the project site; and are of poorer quality which would require more water volume, treatment, and cycles of concentration to be usable for the proposed project. The use of contaminated groundwater would require significantly more pre-treatment prior to usability for the WGS2 plant and would result in higher TDS loads in plant discharge. Adequate quantities of treated wastewater are not currently available. Other inland waters, including other irrigation and groundwater sources were not considered feasible due to unfavorable water quality conditions for use in the proposed project. Surface water from irrigation laterals would require additional pipelines with potential environmental impacts and change existing flow delivery and channel maintenance

programs. The use of local groundwater would potentially cause adverse overdraft impacts and is poorer quality than the City supply.

WASTEWATER DISCHARGE

Wastewater discharged from the proposed WGS2 plant would consist of cooling tower blowdown, demineralizer reject, and domestic sewage. The quantity and quality of wastewater is closely related to the quality of water supply, and the number of cycles run in the cooling tower. As a conservative estimate (“average worst case”) of effluent volume and quality, 10 cycles of concentration were assumed. The quality and quantity of water that would be discharged are shown in **Water Resources Table 3**. WGS2 will discharge between 1.0 to 3.3 million gallons per month (mgmo) to the sanitary sewer located on the existing MID site (MID 2001a, Table 8.13-5). In **Water Resources Table 4** (MID2001DRes1, Data Response No. 48), the concentrations of individual waste constituents are compared for the existing Woodland 1 power plant and for the combined Woodland 1 and WGS2 plants. In general, the composition of wastewater discharge from the proposed WGS2 project is expected to be very similar to current discharge from the existing Woodland 1 power plant. Many of the constituent concentrations will actually decrease with the operation of the proposed WGS2 project.

The Applicant has consulted with the City of Modesto concerning both the quantity and quality of estimated wastewater discharge from the proposed project. The City has requested that MID limit the total mass of TDS discharges to the municipal Water Quality Control Facility system such that the City will not exceed its interim TDS effluent limit of 924 mg/L. Therefore, the proposed project will dispose between 10,000 and 20,000 pounds per month, depending on tower cycling and water quality (**Water Resources Table 3**). In terms of flow volume, the City has agreed that the municipal sewer has adequate capacity to accept the requested quantity of wastewater discharge from the project location (588,000 gallons per day peak flow). The City of Modesto provided a letter to acknowledge the accommodation of this proposed wastewater discharge into the municipal sewer system (MID 2001a, Appendix 8.13-2). In the future, the City may be required to submit additional plans to reduce TDS as part of a Salinity Pollution Prevention Plan. As such, the Applicant will be expected to coordinate and participate with TDS reduction measures at that time.

Wastewater discharge to the City’s Water Quality Control Facility system was selected as having the fewest adverse impacts compared to the following options. Discharge to surface waters would require NPDES permitting and potentially cause adverse effects to aquatic biota or downstream diverters and would also have potential impacts associated with pipeline construction. Dry cooling was previously determined by Energy Commission staff to be more costly and less efficient than wet cooling and would likely be too expensive to be economically feasible for a relatively small facility such as WGS2. Reverse osmosis and a brine concentrator or crystallizer is generally economically infeasible for a small facility and results in additional waste streams that cannot be re-used. Such concentrators, drying facilities, or crystallizers would require additional area for the project site. These wastewater discharge alternatives are discussed in further detail in the section titled **Energy Resources**.

WATER RESOURCES: Table 2
Monthly Water Supply Requirements for WGS2

	Janu ary	Febru ary	Marc h	April	May	June	July	Augu st	Septe mber	Octobe r	Novem ber	Dece mber
Tower TDS (approx.)	423	423	423	423	423	423	423	423	423	423	423	423
Cooling Tower Evaporation Rate (gpm) Estimated	200	200	200	200	400	500	572	572	572	500	200	200
Avg Tower Evaporation (gpm)	8,92 8,00 0	8,064 ,000	8,92 8,00 0	8,640 ,000	17,85 6,000	21,600 ,000	25,534 ,080	25,53 4,080	24,710 ,400	22,320 ,000	8,640 ,000	8,928 ,000
Avg Blowdown (gpm)	992, 000	896,0 00	992, 000	960,0 00	1,984 ,000	2,400, 000	2,837, 120	2,837 ,120	2,745, 600	2,480, 000	960,0 00	992,0 00
Total Water to Cooling Tower (gpm)	222	222	222	222	444	556	636	636	636	556	222	222
Total Water to Cooling Tower (gpm)	9,92 0,00 0	8,960 ,000	9,92 0,00 0	9,600 ,000	19,84 0,000	24,000 ,000	28,371 ,200	28,37 1,200	27,456 ,000	24,800 ,000	9,600 ,000	9,920 ,000

Source: MID 2001a, Table 8.13-4.

WATER RESOURCES: Table 3

Summary of Water Consumption, TDS Discharge, and Wastewater Discharge Using Domestic Surface Water

	Janu ary	Febr uary	Marc h	April	May	June	July	Augu st	Septem ber	Octo ber	Novem ber	Decem ber
Demin Water for WGS2 (mgmo*)	2.3	2.0	2.3	2.2	2.3	2.2	2.3	2.3	2.2.	2.3	2.2	2.3
Cooling Tower Water for WGS2 (mgmo)	9.9	9.0	9.9	9.6	19.7	24.0	28.3	28.4	27.4	24.8	9.6	9.9
TOTAL WATER USED, (mgmo)	12. 2	11.0	12.2	11.8	22.0	26.2	30.6	30.7	29.6	27.1	11.8	12.2
Demin Wastewater from WGS2 (mgmo)	0.1 7	0.18	0.27	0.28	0.27	0.38	0.44	0.50	0.50	0.51	0.19	0.24
Wastewater from Cooling Tower - WGS2 (mgmo)	1.0	0.9	1.0	1.0	2.0	2.4	2.8	2.8	2.7	2.5	1.0	1.0
TOTAL WASTEWA TER (mgmo)	1.2	1.1	1.3	1.3	2.3	2.8	3.2	3.3	3.2	3.0	1.2	1.2
TOTAL TDS Discharged (lbs/month)	10, 532	9,51 2	10,5 32	10,1 92	14,0 27	15,2 66	17,0 33	17,0 33	16,48 4	15,7 75	10,19 2	10,53 2

Source: MID 2001a, Table 8.13-5

*Note: mgmo = million gallons per month

WATER RESOURCES: Table 4
Estimated Influent and Effluent Water Quality of Project

Constituent	Units	Influent	Existing Effluent (Woodland 1)	Estimated Effluent (Woodland 1 & WGS2)
Cations				
Calcium	mg/liter	24.7	88	188
Magnesium	mg/liter	1.4	16	15
Sodium	mg/liter	4	2892	1095
Potassium	mg/liter	<2	7.3	18.3
Anions				
Sulfate	mg/liter	3	6300	2350
Sulfide	mg/liter		0.2	0.5
Chloride	mg/liter		110	275
Metals				
Arsenic	ug/liter	<2	10	25.0
Barium	ug/liter	<50		0.0
Boron	mg/liter	<0.1	0.23	0.6
Cadmium	ug/liter	<5	0.7	1.8
Chromium	ug/liter	<10	29	72.5
Copper	mg/liter	<0.05	<0.03	
Lead	ug/liter		14	35.0
Nickel	ug/liter		10	25.0
Molybdenum	ug/liter		<1	
Mercury	ug/liter	<1	<0.2	
Selenium	ug/liter	<5	29	72.5
Silver	ug/liter	<10	34	85.0
Zinc	mg/liter	<0.05	0.1	0.3
Other				
pH		8.52	*7	7.6
Hardness as	mg/liter	32		
Hydroxide alkalinity	mg/liter	<1	<1	
Conductivity	umhos/cm2	76	14091	5692
Total Dissolved	mg/liter	50	9300	3756
Total Suspended	mg/liter		<20	50

Assumptions:

- Existing Woodland 1 power plant effluent average monthly flow equals 1,632,221 gallons.
- Additional demineralizer usage is 20% of existing throughput which equals 326,444 gallons/month.
- New cooling tower average monthly flow equals 3,339,621 gallons.
- New combined effluent is 37% demin, 63% new tower (from above numbers).
- The new cooling tower has 10 cycles of concentration.
- When influent and existing concentration data is available the new combined effluent was estimated using the formula: Combined Effluent Concentration equals $0.37 * (\text{existing effluent concentration}) + 0.63 * (10 \text{ cycles}) * (\text{existing influent concentration})$.
- If only effluent concentration is known, the Combined Effluent Concentration is approximated to be 2.5 times the existing effluent. Note: This does not apply to sodium and sulfates which are added in the regeneration process. The 2.5 number is derived using the assumption that the existing effluent cycles most constituents 3 times.
- pH is adjusted to approximately 7 during the demineralizer neutralization process.

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
HYDROLOGY AND WATER QUALITY -- Would the project:				
a) Violate any water quality standards or waste discharge requirements?		X		
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			X	
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?		X		
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				X
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				X
f) Otherwise substantially degrade water quality?			X	
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?				X

DISCUSSION OF IMPACTS

COMPLIANCE WITH LORS

SWRCB Policy 75-58. The project will potentially conflict with SWRCB Policy 75-58, which encourages the use of alternative water supplies for power plants whenever possible rather than using domestic surface water supplies. Alternative water sources, consistent with Policy 75-58, were investigated by the Applicant and were determined to be environmentally or economically infeasible. The SWRCB will review the infeasible evaluation of these other water supply alternatives (as outlined in the SPPE Application) in order to issue a statement (permit) that the proposed project is consistent with Policy 75-58.

The City expects to expand surface water treatment capacity to 60 MGD by 2005. Water use of the proposed project represents less than 2 percent of the estimated 60 MGD City of Modesto surface water supply after expansion of the treatment facility in 2005. The City has agreed that water is available for the proposed project and has agreed to serve it at the location and in the quantities requested. The "Will Serve" letter is included as Appendix 8.13-1 of the SPPE Application. Available water supplies are not a limiting concern in the short term or medium term time frame for the proposed project. In the longer term, Modesto officials believe there are ample opportunities to develop conjunctive use or recycled water uses in the future should water supply become a limiting concern to the region (Response to CEC Data Requests, CEC2001Dreq1). Therefore, the project's use of potable water is considered a less than significant impact, assuming that Condition of Exemption Water-1 (confirmation that the project is acceptable to the SWRCB) is met.

IMPACTS IN ENVIRONMENTAL CHECKLIST

A. Violation of Water Quality or Waste Discharge Requirements: Less than Significant with Mitigation Incorporated

In regard to wastewater discharge, the City of Modesto has indicated by letter (City of Modesto, April 11, 2001) that the municipal sewer system has sufficient capacity to accommodate the additional wastewater discharge from the proposed project. Effluent levels shall be regulated to maintain Total Dissolved Solids (TDS) that are consistent with the City's current TDS effluent limit. An Industrial Discharge Permit will be issued to the Applicant as either a new permit or an amended permit for the existing wastewater discharge. The project will be defined as a categorical discharger in accordance with federal and State regulations, and the discharge will be consistent with the City of Modesto's interim NPDES issued by the CVRWQCB. In the future the City may be required to submit additional plans to reduce TDS as part of a Salinity Pollution Prevention Plan. As such, the Applicant will be expected to coordinate and participate with TDS reduction measures at that time (see **Water Resources Table 2**).

B. Depletion of Groundwater Supplies or Recharge: Less than Significant

The proposed project will not use groundwater supplies but will use surface water supplies from Modesto Regional Water Treatment Plant located at MID's Modesto Reservoir.

Regarding construction and operational related impacts to groundwater and surface water quality, the project will implement BMPs to control pollution of ground and surface water. The project will comply with applicable stormwater requirements, such that no degradation of water quality as a result of stormwater runoff or erosion occurs.

C. Substantial Alteration of Drainage Patterns or Causing Erosion: Less Than Significant With Mitigation Incorporated

The construction and operation of the proposed WGS2 project, as well as the new gas pipeline segments and the construction of the connecting 10" water supply pipe will not impact the existing drainage pattern or involve impacts to any streams or other water bodies. As noted in the City of Modesto General Plan, erosion and sedimentation hazards are generally slight in the relatively flat Modesto area.

Construction of the proposed WGS2 plant will occur on 2.5 acres of land that exists within the fenced footprint of the existing Woodland 1 plant. The proposed project will occupy an area that is currently used for equipment storage and drains to the existing stormwater percolation pond.

During construction and operation, stormwater runoff and erosion will be controlled through adherence to the conditions of a CVRWQCB Construction Activity Stormwater Permit. The permit requires a SWPPP that specifies measures, including BMPs that will be used to control erosion and sedimentation.

The SWPPP will include the following measures:

- BMPs to minimize erosion prior to construction and implement the BMPs during and after construction. Surface soil protection may include the use of mulches, synthetic netting material, riprap, and the compacting of native soil.
- Conduct all construction activities in accordance with California's General Industrial Storm Water Permit for Construction Sites, including the erosion control measures in the SWPPP and BMPs to reduce erosion and the transport of increased suspended sediment from construction areas.
- In the construction area soil should be graded and compacted to ensure that soil is not left in irregular piles that are more susceptible to water and wind erosion. Seeding will be performed in the areas where natural vegetation has been distressed or removed by construction activity.

Construction activities related to the gas and water pipelines will involve trenching, stringing, pipe installation, backfilling, and plating. Additionally, HDD borings shall occur to install the gas line reinforcements beneath existing irrigation/drainage ditches. Specific BMPs that are appropriate to minimize wind and water erosion associated with these trenching and boring activities will be developed in

accordance with a specific Stormwater and Erosion Control Plan as a Condition of Exemption. Erosion and sediment controls will be implemented and BMPs will achieve compliance with the NPDES Storm Water General Permit for Storm Water Discharge Associated with Construction Activity and all other applicable LORS.

The Applicant has indicated that adequate sedimentation and erosion controls will be employed, but has not provided a specific Stormwater and Erosion Control for either the construction or operational phase of the project or the associated linear facilities that includes transmission lines and pipelines. Conditions of Exemption (WATER-3 through WATER-5) require that the Applicant provide these documents prior to the start of construction.

D. Alteration of Drainage Resulting in Flooding: No Impact

The construction and operation of the proposed project at the WGS2 site, as well as the gas and water lines will not impact the existing drainage patterns or involve impacts to any streams or other water bodies.

As described above, the construction and operation of the proposed project will not impact the existing drainage pattern or involve impacts to any streams or other water bodies. Nor would the proposed project result in substantial increases in surface runoff or cause flooding. The underground boring and placement of the proposed gas lines beneath two existing irrigation/drainage ditches shall occur at a depth not to interfere with the operation of these channels nor induce any drainage or flooding impacts.

The California General Permit for Discharges of Storm Water Associated with Industrial Activity and associated monitoring and reporting requirements do not apply to WGS2 since the facility does not discharge storm water to the waters of the United States, and the permit expressly exempts facilities disposing of stormwater to evaporation or percolation ponds.

E. Excess Runoff or Stormwater Drainage: Less than Significant

Stormwater runoff associated with the proposed project site at the existing Woodland 1 power plant is controlled on-site. The area inside the existing fence line is graded to route stormwater runoff to a drainage system that discharges to an on-site evaporation/percolation pond. The proposed project will also contribute runoff to the existing on-site evaporation/percolation pond. The existing collection pond is large enough to accommodate stormflows for the proposed project area. Stormflows from the proposed project area are not expected to be greater than existing runoff volumes.

F. Degradation of Water Quality: Less Than Significant

As described above, the proposed project's waste will be discharged in accordance with applicable laws and local permits. No additional impacts to water quality, beyond considerations described for issues A, B, and C above, are expected.

G, H, I, J. Housing in 100-Year Flood Zone: No Impact

The existing Woodland 1 and proposed WGS2 power plant footprints are not located within a Federal Emergency Management Agency (FEMA) designated

100-year flood zone. No housing or structures would be created that would impede or redirect flood flows. The proposed project area that is currently used for equipment storage presently drains to the pond. Discharge of stormflow will not occur off-site and therefore the project will not cause or contribute to flooding potential. As an inland project not near any large water body or hillslope, inundation by seiche, tsunami, or mudflow is not possible.

CUMULATIVE IMPACTS

There are no significant water resources cumulative impacts.

CONCLUSIONS

The proposed WGS2 project will result in less than significant impacts to the public or the environment if the suggested mitigation measures and the following conditions of exemption are implemented.

PROPOSED CONDITIONS OF EXEMPTION

The following conditions have been developed for the project:

WATER 1: The project Applicant shall obtain a letter of review by the SWRCB that the proposed project is consistent with Policy 75-58. Information regarding other available water sources is outlined in the SPPE Application.

Verification: Prior to project initiation and the start of any site mobilization, this letter of review regarding available and selected water supplies for the proposed project shall be submitted to the Energy Commission.

WATER 2: In accordance with Municipal Ordinance No. 3137-CS, the project Applicant will obtain a final Discharge Permit prepared in accordance with the City of Modesto to facilitate project wastewater discharge to the City's Water Quality Control Facility. Discharges that could adversely affect the sewage treatment capacity of surface waters shall not be permitted. The project will not operate without a valid permit in place.

Verification: The Applicant will obtain and provide a copy of the final Discharge Permit issued by the City of Modesto to accommodate the project's wastewater discharge to the Energy Commission Compliance Project Manager (CPM) at least 60-days prior to the City's Water Quality Control Facility receiving any wastewater discharge from the project. Any change to either the chemical or physical parameters or volume of the wastewater discharge permitted will be noticed in writing to both the CPM and the City of Modesto during both construction and/or operation. The project Applicant will notify the Energy Commission in writing of any changes to the Discharge Permit, either instituted by the project owner or the City of Modesto, including any permit renewal. The project owner will provide the CPM with the annual monitoring report summary required by the Discharge Permit, and will fully explain any violations, exceedances, enforcement actions, and remedial actions.

WATER 3: Prior to beginning any site mobilization, the project owner shall obtain Energy Commission staff approval for a Storm Water Pollution Prevention Plan (SWPPP) as required under the General Storm Water Construction Activity Permit for the project.

Verification: At least thirty days prior to the start of any site mobilization, the project owner will submit a copy of the Storm Water Pollution Prevention Plan (SWPPP) to the Energy Commission Compliance Project Manager (CPM) for review and approval. Approval of the plan by the CPM must be received prior to the initiation of any site mobilization activities.

WATER 4: Prior to beginning any site mobilization activities, the project owner shall obtain staff approval for a final erosion control and revegetation plan that addresses all project elements. The final plan to be submitted for staff's approval shall contain all the elements of the draft plan with changes made to address any staff comments and the final design of the project.

Verification: The erosion control and revegetation plan shall be submitted to the CPM no later than thirty days prior to start of any site mobilization. Approval of the final plan by the CPM must be received prior to the initiation of any site mobilization activities.

WATER 5: During project operation the project owner will not discharge any stormwater offsite. All stormwater will be collected and directed to the onsite evaporation/infiltration basin. Any stormwater leaving the site during commercial operation will require a General Industrial Activity Storm Water Permit and a Storm Water Pollution Prevention Plan (SWPPP). Approval for the final Industrial Activities SWPPP must be obtained from Energy Commission staff prior to commercial operation and/or offsite discharge of stormwater.

Verification: Should stormwater be discharged off site, the project owner will submit to the CPM a copy of the Storm Water Pollution Prevention Plan (SWPPP) prepared under the requirements of the General Industrial Activity Storm Water Permit at least 30 days prior to the start of commercial operation and/or offsite stormwater discharge. The final plan shall contain all the elements of the draft plan with changes made to address staff comments and the final design of the project.

REFERENCES

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Hydrologic Consultants, Inc. (HCI). 1993. Development of a Groundwater Modesto, Turlock and Modesto Areas. Draft Report to Modesto Irrigation District and Turlock Irrigation District. September. *In* MID. 1996. Draft Final Groundwater Management Plan. March 1996.

Ketschner, B. 2001. Irrigation Engineering Manager, City of Modesto. Personal Comment, March 13, 2000 (as reported in MID 2001a).

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MID (Modesto Irrigation District). 1996. Draft Final Groundwater Management Plan. March 1996.

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_____. MID2001DRes1. Modesto Irrigation District response to staff Data Requests, Set 1, Nos. 1, 10, 12, 23, 24, 42-48, Woodland Generating Station 2 (01-SPPE-1). Submitted to California Energy Commission on June 8, 2001.

Salyer, Gregory. 2001. Generation Manager at MID. Personal comment April 4, 2001 (as reported in MID 2001a).

LAND USE AND RECREATION

Testimony of Negar Vahidi

INTRODUCTION

The land use and recreation analysis of the WGS2 Project focuses on the project's compatibility with existing and planned land uses, its consistency with applicable land use plans, ordinances and policies, and its potential to impact recreational facilities.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Local land use LORS applicable to the proposed project include the City of Modesto Urban Area General Plan, the City of Modesto Amended Redevelopment Plan for the Modesto Redevelopment Project (Modesto Redevelopment Plan), and the City of Modesto Zoning Ordinance. For the City of Ripon and unincorporated areas traversed by the proposed project's linear facilities the zoning ordinances and general plans of Stanislaus and San Joaquin Counties apply.

CITY OF MODESTO GENERAL PLAN

Land use is controlled and regulated by a system of plans, policies, goals, and ordinances that are adopted by the various jurisdictions with land use authority over the area encompassed by the proposed project. The general plan is a broadly scoped planning document and defines large-scale planned development patterns over a relatively long timeframe.

The Modesto General Plan includes specific policies to preserve and enhance existing development and to provide for orderly and appropriate new development of the City of Modesto (Modesto) through the year 2025. Actions and approvals required by the City of Modesto Planning Department must be consistent with the Modesto General Plan.

The Modesto General Plan covers the following elements of planning: community growth, community development (land use), housing, community services and facilities (including transportation, open space and hazards management), public safety, and environmental resources. Each element contains goals, policies, and implementation measures that may be pertinent to the proposed project, including the linear transmission facilities.

The proposed project site exists within the geographic area named in the Modesto General Plan as the Redevelopment Area, one of the three geographic areas assessed in the Modesto General Plan. The land use designation for the project site is a Redevelopment Planning District (RPD). The RPD designation is only applied to areas designated in the Redevelopment Project Area and is intended to implement the mission of the Redevelopment

Agency. Public utilities are allowable land uses within this designation (Boston, 2001).

Analysis of land use policies for the proposed project focuses on the policies directly linked to the characteristics of the proposed project, such as the siting of a utility facility and linear features, energy and infrastructure planning, public utilities, land supply, economic development in a redevelopment area, and ROWs. Land use policies applicable to the proposed project, which is within the Redevelopment Area, include:

- Provide sufficient land supply for economic development as a key consideration of future expansion, with top priority given to business park areas (B.1.a.(1)).
- In addition to providing adequate land and opportunities to expand and diversify economic base for 21st century technologies, current agricultural and industrial bases shall be preserved for as long as possible (B.1.a.(2)).
- Business parks and other industrial lands should be located near existing and proposed transportation corridors (State Routes 99 and 132) and proposed expressways (B.1.a.(3)).
- Economic development opportunities should receive highest priority for receiving future, necessary infrastructure development (B.1.b).
- City will proactively assist the private sector wishing to develop viable business parks by expediting development requests (B.1.c).
- New growth and development should provide public infrastructure and should generate public revenue. City should consider long-range fiscal impact when evaluating developing proposals (B.2).
- Five-year supply of available vacant and agricultural land with urban infrastructure is desirable (C.1.a).
- Urban development should be kept as contiguous as possible (C.1.b).
- Urban growth should be directed to areas currently served with City services (C.1.d).

Because a power plant is a permitted use for the land use designation and zoning within the City of Modesto, the proposed project does not require discretionary approval from the City of Modesto.

CITY OF MODESTO ZONING ORDINANCE

The City of Modesto Zoning Ordinance (Modesto Zoning Ordinance) is the primary tool for achieving the objectives of the Modesto General Plan. The Modesto Zoning Ordinance provides detailed specifications for allowable development within areas designated by the Modesto General Plan. The project site is zoned Light Industrial (M-I), and exists within the Light Manufacturing zoning district for which the development of electrical utilities is a permitted use (Osner, 2001).

MODESTO REDEVELOPMENT PLAN

The proposed project would exist within the City's single redevelopment project area, the Modesto Redevelopment Project. The 1994 Amended Redevelopment Plan (Redevelopment Plan) for the Modesto Redevelopment Project and the 1994 Implementation Plan for the Modesto Redevelopment Plan (Implementation Plan) serve a similar role as the Modesto General Plan, but provide more specific guidance on land use and development within the redevelopment area. The Redevelopment Plan provides the framework for which specific development plans for the redevelopment area will follow, and the Implementation Plan provides specific goals for particular areas of the redevelopment area. The proposed project is required to conform to the policies and guidelines set forth in these plans. Applicable goals and policies include:

- Areas shown on the Project Boundary and Land Use Map for industrial, commercial or public uses shall be used for these purposes as permitted in the City's General Plan (Section 400 - Uses Permitted in the Project Area, Section 405 - Industrial/Commercial/Public Use).
- Additional public streets, alleys and easements may be created in the Project Area as needed for proper development (Section 507 - Public Rights of Way).
- Public rights of way may be used for vehicular and/or pedestrian traffic, as well as for public improvements, public and private utilities and activities typically found in public rights of way (Section 507 - Public Rights of Way).
- Agency is authorized to permit maintenance, establishment or enlargement of public, semi-public...[etc] and facilities of other similar associations or organizations in areas shown on the Project Area Boundary and Land Use Map (Section 408 - Other Public, Semi-Public, Institutional and Nonprofit Uses).
- Eliminate blighting influences and stimulate new private and public investment in the redevelopment area (Implementation Plan Goal).
- The area between Kansas and Woodland Avenues, west of 9th Street provides the greatest opportunity for creation of small, but modern industrial park subdivision (Implementation Plan Strategy No. 2).

The land use designation for the project site is a Redevelopment Planning District (RPD), and it is zoned Light Industrial (M-I). Areas designated as RPD are intended to implement the mission of the Redevelopment Agency. This designation is only applied to areas designated in the Redevelopment Project Area. Public utilities are allowable land uses within this designation. Because the proposed project is not seeking funding assistance from the City of Modesto Redevelopment Agency, the Agency does not require review of the proposed project within the redevelopment zone (Boston, 2001).

STANISLAUS COUNTY GENERAL PLAN

Some unincorporated lands exist within the vicinity of the proposed project site, and proposed electrical subtransmission line and water pipeline routes, although none of these facilities are within any unincorporated lands. These lands consist of a mixture of residential, commercial, industrial, and mixed-use land use designations provided by the Stanislaus County General Plan. Zoning districts in these areas include residential, commercial, industrial, professional offices, and planned development. Several of the zoning districts within the vicinity allow or conditionally permit utility facilities (residential, commercial and professional office districts). The development and maintenance of linear utility facilities within existing ROWs are generally allowable uses, and would be permitted through acquiring encroachment permits. However, it should be noted that no discretionary approvals, or permits would need to be obtained from Stanislaus County (Duvall, 2001).

SAN JOAQUIN COUNTY GENERAL PLAN AND ZONING ORDINANCE

The area along the 16-inch diameter natural gas pipeline system reinforcement to PG&E's Line 108 (beginning at intersection of East Avenue D and Airport Way and terminating to the north at West Ripon Road) is designated and zoned for general agricultural use by San Joaquin County. For the area along the proposed 12-inch natural gas pipeline system reinforcement to PG&E's Distributed Feeder Main (beginning at the intersection of South Austin Road and West Ripon Road and terminating at the intersection of Doak and Vera) that is within the jurisdiction of San Joaquin County, the land use designation and zoning are for general agriculture uses. Major utility uses, as defined in Sections 9-115.580 and Chapter 9-600 of the San Joaquin County zoning regulations, are conditionally permitted uses in areas zoned general agriculture (AG). Major utility uses typically include natural gas transmission lines. As the 12-inch natural gas pipeline segment traverses east, it enters the jurisdiction of the City of Ripon. The development or maintenance of linear utility facilities within an existing ROW is an allowable use, subject to acquiring an encroachment permit (Giullian, 2001).

SETTING

PROJECT LOCATION

WOODLAND GENERATION STATION 2 SITE

The approximately 2.5-acre proposed project site is on the property of the existing MID facility located adjacent to the Woodland 1 Generation Station at 920 Woodland Avenue. The site is located on the southeast corner of Woodland Avenue and Graphics Drive in the central portion of the City of Modesto. Specifically, the project site is bordered by Woodland Avenue to the north, Graphics Drive to the west, 9th Street/Union Pacific Railroad right-of-way (UPRR ROW) to the east, and the FMC Corporation site to the south and west.

Currently, the proposed project site is vacant and being used as a materials storage area.

LINEAR FACILITIES

The linear facilities for the project include an electrical subtransmission line, water pipeline, and natural gas pipeline segments. The proposed routes for the electrical subtransmission line and water pipeline line occur in existing public ROWs currently used for either the railroad, public streets, or water conveyance. The electrical subtransmission line and water pipeline would be located in the City of Modesto. The new natural gas pipeline segments would be located in San Joaquin County at their origination points. A 16-inch and a 12-inch segment to PG&E's existing gas pipelines (Line 108) and Distributed Feeder Main, respectively, would be constructed in two areas of Stanislaus County. The construction of the gas line involves the trenching and laying of an additional pipeline alongside the existing line. The 16-inch line traversing north-south from South Airport Way to East Ripon Road would occur adjacent to existing pipeline ROW. The 12-inch segment to PG&E's Distributed Feeder Main would proceed into the City of Ripon as it traverses east.

SURROUNDING LAND USE

Land uses surrounding the project site include commercial and industrial uses, and are described as follows:

- The MID's administrative complex and offices are located to the north of the project site, across the street on Woodland Avenue. Further north and beyond the MID offices are light industrial and manufacturing uses. The area to the north is zoned for industrial use.
- The vacant FMC Corporation site is located to the west and south of the project site. There is a vacant structure on this site located immediately west of the project site. Currently, the FMC site is undergoing soil remediation for barium and heavy metals contamination. This site is zoned for industrial development and the City of Modesto plans on developing the site with an industrial park.
- Land uses to the east of the project site include the UPRR ROW and industrial warehouse facilities.

Existing land uses along the proposed electrical subtransmission line ROW include:

- Industrial uses along 9th Street.
- Industrial, light industrial, and manufacturing uses along Tully Road and at the intersection of Tully Road and Stoddard Avenue.
- Institutional uses such as the Modesto Jr. College and Great Valley Museum, and multi-family residential uses on Stoddard Avenue as it approaches Terminal Avenue. There is an existing MID electric distribution line located along the south side of Stoddard Avenue.

- Single family residential uses along the terminus of Stoddard Avenue at Terminal Avenue, and along Terminal Avenue, until the ROW connects into MID's Enslin Substation.

Land uses along the water pipeline route generally consist of industrial uses and vacant lots along Graphics Drive, and industrial and commercial development along Kansas Avenue. The water line would tie into an existing water main adjacent to the Lateral No. 4 canal located off of Kansas Avenue just west of the UPRR ROW.

Existing land uses in the vicinity of the proposed gas line reinforcement area include agricultural, residential and transportation (county roads) uses. Within the vicinity of the proposed 16-inch natural gas line reinforcement, the area is generally undeveloped agricultural. The 12-inch line, traversing east-west from the vicinity of East West Ripon Road at South Austin Street, would be installed along East West Ripon Road. Existing land uses in the vicinity of the 12-inch pipeline segment include agricultural uses such as ranchettes and orchards, which transition to residential uses such as single- and multi-family residences, a school and playground along Jack Tone Road, and residential areas along Doak.

RECREATIONAL FACILITIES

The following neighborhood parks exist in the project's vicinity: Earl St. Garrison Park, J.M. Pike Park, and Charles M. Sharp Park. In addition, Enslin Park is located approximately 1,000 feet east of the subtransmission line. Elk Park is adjacent to the Enslin Substation, and is approximately 500 feet from the nearest portion of the subtransmission line. All of these parks are located in the City of Modesto. The sports and athletic facilities of the Modesto Jr. College are located at the College Campus on Stoddard Avenue. In San Joaquin County, the Community Center Park is in the vicinity of the 12-inch east-west natural gas transmission line reinforcement area.

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
LAND USE AND PLANNING -- Would the project:				
a) Physically divide an established community?			X	

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
LAND USE AND PLANNING -- Would the project:				
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			X	
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X
RECREATION				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				X

DISCUSSION OF IMPACTS

LAND USE AND PLANNING

A. Division of an Established Community: Less Than Significant Impact

The proposed WGS2 would be located in an area within the City of Modesto designated for industrial development, and the site is currently surrounded by industrial uses. The facility would comply with existing zoning, and would be an extension of the existing MID power generation operations at Woodland 1. Given the proposed development's consistency with on-site land use and zoning designations and its compatibility with the industrial characteristic of the project area, the proposed WGS2 would not alter land use patterns. Therefore, no physical division of an established community would occur. Impacts would be less than significant.

The proposed routes for the electrical subtransmission line and water pipeline are in existing public ROWs currently used for the railroad, public streets, or water conveyance. Construction and operation of the electrical subtransmission facilities and water line would be consistent with established zoning, and would not divide or disrupt existing land uses or an established community. Although the electric subtransmission line would traverse areas with sensitive land uses such as the institutional and residential uses along Stoddard and Terminal Avenues, the subtransmission line is proposed to replace MID's existing electric distribution line located along these public roadways. Construction of the subtransmission line would include installation of

poles adjacent to existing poles, or pole upgrades. No additional poles are proposed. The proposed water line would tie into the existing water main adjacent to the Lateral No. 4 canal, where it would tie into a City water supply for supply to the proposed project site. Given the temporary nature of construction activities associated with subtransmission line pole replacements/upgrades and the water pipeline, and the fact that these linear facilities would be placed within existing public ROWs, the linear facilities would not physically divide an established community. Impacts would be less than significant.

The proposed gas pipeline route also would primarily utilize existing public utility ROWs (i.e., existing roadways or pipeline ROWs). Construction would involve temporary disruption to land uses along the proposed ROW, which include agriculture and residential uses. No aboveground structures would be built, and operation of the pipeline would not preclude existing or planned uses in the vicinity of the pipelines. Construction and operation of the pipelines would not disrupt or divide an established community. Impacts would be less than significant.

B. Conflict with Land Use Plans or Policies: Less Than Significant Impact

As described above, the proposed WGS2 would be located in an area intended for industrial development based on its land use and zoning designation. Furthermore, the site is adjacent to an existing and similar industrial use, Woodland 1. The proposed WGS2 would represent an urban in-fill project, consistent with City of Modesto policies on economic development for the Redevelopment Project area and contiguous urban development.

In Modesto, the proposed linear facilities' routes would occur in existing public ROWs currently used for the railroad, public roadways, or water conveyance. Installation of the electrical subtransmission line and water pipeline is consistent with Modesto's policy on the use of public ROWs for public utility activities typically found in public ROWs. In general, linear facilities associated with the project are permitted or conditionally permitted uses for the zoning districts within which they will exist. PG&E would enter into a franchise agreement with the City of Ripon for the proposed gas pipeline, where it will be constructed in city streets.

The objective of the proposed project is to meet the electricity demand of local MID customers. Given this objective, and the proposed project's consistency with applicable LORS of affected jurisdictions, impacts would be less than significant.

C. Conflict with Habitat or Natural Community Conservation Plans: No Impact

There are no habitat conservation plans or natural community conservation plans adopted by the jurisdictions that would be affected by the proposed project. Therefore, the proposed project would not conflict with existing plans and there would be no impact.

RECREATION

A. Increased Use of Recreational Facilities: No Impact

Physical impacts to public services and facilities such as recreational facilities are usually associated with population immigration and growth in an area, which increase the demand for a particular service. An increase in population in any given area may result in the need to develop new, or alter existing, government facilities in order to accommodate increased demand.

As an electric generation project seeking to meet the current demand of MID customers, the proposed project is not expected to result in an increase in the population of the area. As described in the SPPE application, construction of the generation station would require an average of 72 workers, and 97 workers during peak construction (MID 2001a, p. 8.8-8). The transmission line construction would be performed by two or three 3-person crews of existing MID employees. The peak workforce for pipeline construction is estimated at 71. According to the California Employment Development Department, the workforce in the Modesto Metropolitan Statistical Area would be adequate to fulfill MID's need for its temporary construction workforce. In addition, MID is expected to increase its current workforce by only three to four full-time employees to operate the WGS2. Given the availability of local workforce and the temporary nature of construction activities, proposed project construction is not expected to result in population growth. In addition, given the number of operational personnel needed (maximum four personnel), plant operation would only result in a negligible contribution to the area's population. Therefore, it is not expected that the proposed project would increase the use of existing recreational facilities such that a substantial physical deterioration of these facilities would occur. No significant impacts would occur.

B. Construction of Recreational Facilities: No Impact

As a power generation project, the proposed project does not include recreational facilities or require the construction or expansion of existing recreational facilities. As described above, the proposed project would not result in an increase in the area's population that would require new or expanded recreational facilities whose construction would in turn lead to an adverse physical effect on the environment. No impacts would occur.

CUMULATIVE IMPACTS

Cumulative impacts may be caused if a project would have effects that are individually limited but cumulatively considerable when viewed together with the effects of related projects. Only three projects are proposed to occur in the vicinity of the proposed project:

- The Modesto Junior College Commercial Project (approximately $\frac{3}{4}$ mile east of the proposed site) is proposed to include commercial development around the perimeter of the existing campus. The project is currently in a proposal status and no analysis or environmental documentation has been filed.

- The Northwest Business Park Project is planned to occur (approximately 1½ miles north of the project site) in the proposed Northwest Business Park. Uses in the park will be consistent with the Business Park (BP) land use designation, although no specific uses have been declared. As of March 2001, an EIR is currently being prepared, but is not currently available for review. The project may require a specific plan to be prepared.
- The FMC Alkali Division owns the property south of the proposed site. The project is under remediation to clean up contaminants from previous operations. It is formerly the FMC Barium Plant, and is proposed to be used as an infill industrial/ business park site. The site is currently zoned for M-2 uses. The exact future use of the site or the potential for the site to be rezoned has not been determined, however, any future use will be compatible with the mission of the Redevelopment Area Project.

As described in this Initial Study, the proposed project would not result in any significant land use or recreation impacts. In addition, the WGS2 project does not appear to make a significant contribution to regional impacts related to new development and growth, such as population immigration, increased demand for public services, expansion of public infrastructure, or loss of open space. Therefore, the proposed project's contribution to land use and recreation impacts resulting from past, present, and probable future projects also is not expected to be cumulatively considerable. The proposed project has compatible land uses with the industrial and commercial projects discussed above, which are proposed in the vicinity. Similar to the proposed project, the three projects are consistent with goals of the City of Modesto General Plan and Redevelopment Plan, and are consistent with current land use designations and zoning. Staff concludes there are no cumulative land use or recreation impacts.

CONCLUSIONS

The project would not physically divide an established community, conflict with any applicable land use plan, policy, or regulation, and would not conflict with any applicable habitat conservation plan. The proposed use would be consistent with the provisions of the City and County General Plans and zoning ordinances. The impacts for Land Use and Planning are, therefore, less than significant.

The project would not significantly increase the use of public parks or recreational facilities, nor would it necessitate the construction or expansion of recreational facilities. The impacts for Recreation are, therefore, less than significant.

PROPOSED CONDITIONS OF EXEMPTION

None proposed.

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NOISE AND VIBRATION

Testimony of Jim Buntin

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 operation or construction practices, such as pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the WGS2 Project, 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).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time to which the worker is exposed. 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.

NOISE: Table 1
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: OSHA Regulation

There are no federal laws governing off-site (community) noise.

The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of ground-borne vibration associated with construction of rail projects, which have been applied by other jurisdictions to other types of projects. The FTA-recommended vibration standards are expressed in terms of the “vibration level,” which is calculated from the peak particle velocity measured from ground-borne vibration. The FTA measure of the threshold of perception is 65 VdB, which correlates to a peak particle velocity of about 0.002 inches per second (in/sec). The FTA measure of the threshold of architectural damage for conventional sensitive structures is 100 VdB, which correlates to a peak particle velocity of about 0.2 in/sec.

STATE

California Government Code Section 65302(f) encourages each local government entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure.

The State of California, Office of Noise Control, prepared a Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence of local noise standards. The Model also contains a definition of “pure tone” which can be used to determine whether a noise source contains significant pure tone components. The Model Community Noise Control Ordinance further recommends that, when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by 5 dBA.

Other State LORS include the California Environmental Quality Act (CEQA) and the California Occupational Safety and Health Administration (Cal-OSHA) regulations.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of CEQA Guidelines (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:

- 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;
- exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

- a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

The Energy Commission has interpreted the CEQA criteria such that noise produced by the permitted power-producing facility that causes an increase of more than 5 dBA in the background noise level (L_{90}) at a noise sensitive receiver during the quietest hours of the day is usually considered a significant effect.

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 feasible noise abatement measures are implemented for noise-producing equipment.

CAL-OSHA

Cal-OSHA has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards (see **NOISE Appendix A, Table A4**).

LOCAL

STANISLAUS COUNTY GENERAL PLAN NOISE ELEMENT

Stanislaus County has adopted specific noise performance standards for stationary sources in the Noise Element of the General Plan (Stanislaus County 1988). New development of industrial uses is not permitted if the resulting noise level will exceed 60 dB L_{dn} in areas containing noise sensitive uses. In addition, compliance with the noise performance standards is required. The median noise level performance standards for noise-sensitive land uses are 50 dBA during daytime hours, and 45 dBA during nighttime hours. If pure tones are present, the standards are lowered by 5 dBA. Construction noise is not specifically addressed in the Noise Element.

CITY OF MODESTO GENERAL PLAN NOISE ELEMENT

The City of Modesto has adopted land use compatibility guidelines for noise in the Noise Element of the General Plan (City of Modesto 1995). The noise level considered normally acceptable for residential land uses is 60 dB L_{dn} or CNEL. Acceptable noise levels for other land use categories are 65 dB L_{dn} for multi-family residential or transient lodging; 70 dB L_{dn} for schools, playgrounds, parks and commercial; and 75 dB L_{dn} for industrial and agricultural.

CITY OF MODESTO MUNICIPAL CODE

Section 4-9.103 of the Modesto Municipal Code effectively prohibits construction activities at locations adjacent to residential uses outside the hours of 7:00 a.m. to 9:00 p.m. weekdays, and 9:00 a.m. to 9:00 p.m. on weekends and holidays. Since

the proposed project site is relatively distant from residential areas in the City of Modesto, construction noise is only of concern in the City of Modesto for the subtransmission line and gas lines.

SAN JOAQUIN COUNTY CODE

Section 9-1025.9 (c.) (3) of the San Joaquin County Code exempts construction noise from County standards during the hours of 6:00 a.m. to 9:00 p.m. Section 9-1025.9 (c.) (7) exempts noise associated with modifications of private and public utilities for maintenance or modifications to their facilities. Construction noise is only of concern in San Joaquin County for gas lines.

CITY OF RIPON MUNICIPAL CODE

Section 16.20.030R of the Ripon Municipal Code effectively prohibits construction activities at locations adjacent to residential uses outside the hours of 7:00 a.m. to 7:00 p.m. weekdays and Saturdays, and 10:00 a.m. to 6:00 p.m. on Sundays. Construction noise is only of concern in the City of Ripon for the natural gas pipelines that are required to support the WGS2 project.

SETTING

PROJECT BACKGROUND

The WGS2 Project involves the construction and operation of an 80-megawatt (MW) power plant, which is proposed to be located at the existing MID Woodland 1 Generation Station site that is owned and operated by Modesto Irrigation District (MID).

The new unit will be a natural gas-fired, combined-cycle generating facility consisting of one modern combustion turbine and a condensing steam turbine, with either a conventional drum-type heat recovery steam generator (HRSG) or a once-through steam generator (OTSG).

The WGS2 will connect with the electrical grid at a nearby existing substation in Modesto, and will require 1.2 miles of 69 kV subtransmission line.

Approximately 6 miles of construction will be required for gas line system reinforcements, which will occur in the Cities of Modesto and Ripon, as well as in unincorporated San Joaquin County. Gas line reinforcements will require use of horizontal drilling equipment in certain locations.

The equipment that has the greatest potential to generate significant operational noise levels includes the gas and steam turbines, steam generator, pumps, motors, main transformers, and an instrument air compressor. During construction of the project, horizontal drilling and use of other powered equipment has the potential to produce significant noise levels. In addition, pile driving has the potential to produce significant noise and ground-borne vibration levels.

EXISTING LAND USE

POWER PLANT SITE

This site is located within the City of Modesto, at 920 Woodland Avenue. The WGS2 would be located adjacent to the existing Woodland 1 facility, on MID property. Land uses in the immediate project vicinity include commercial and industrial uses. Residential, school, church, and park uses are located north and east of the project site.

Noise from traffic on State Route 99 (SR99) dominates the background acoustical environment in the near vicinity. Other significant noise sources are the Woodland 1 facility, activities at other industrial properties, local traffic, and train movements on the Union Pacific railroad lines. The closest noise sensitive receptor is a motel located about 885 feet away. The nearest home is about 1,450 feet away, adjacent to a park. A church is located about 1,250 feet away, and the nearest school is 1,500 feet distant.

LINEAR FACILITIES

The WGS2 will require a new 1.2 mile 69 kV subtransmission line that will extend from the project site to the existing MID Enslin substation (MID 2001a, § 5.3). New poles for this purpose will replace existing poles, and some poles may have to be added.

The WGS2 will tie into natural gas and potable water supply pipelines that are located within the property boundary of the Woodland 1 site. The gas lines will be reinforced over a distance of about 6 miles, requiring horizontal drilling and other construction along their length.

EXISTING NOISE LEVELS

In order to predict the likely noise effects of the project on adjacent sensitive receptors, the Applicant commissioned ambient noise surveys of the area. The surveys were conducted, at various hourly time intervals, beginning on March 22, 2001. The noise surveys were conducted using Bruel & Kjaer sound level meters meeting the requirements of the American National Standards Institute (ANSI) for Type 1 sound level measurement systems (MID 2001a, § 8.5.3.1).

The Applicant's noise survey monitored existing noise levels at the following six off-site monitoring locations, which are shown as M1 through M6 by **NOISE Figure 1**. Twenty-five-hour continuous noise measurements were conducted at Sites M1 and M2.

- 1434 Louise Avenue
- Traveler's Motel
- J.M. Pike Park
- New Harvest Christian Fellowship
- Modesto Junior College

- Abrams College (961 Emerald Avenue)

NOISE Table 2 summarizes the ambient noise measurement results (MID 2001a, § 8.5.3.2).

**NOISE: Table 2
Summary of Measured Noise Levels**

Measurement Sites	Measured Noise Levels, dBA		
	Nighttime		CNEL
	L _{eq}	L ₉₀	
M1	42-50	39-48	53
M2	57-65	52-58	69
M3	49	49	57*
M4	57-60	52-54	66*
M5	53	48	61*
M6	62	57	71*

* Energy Commission staff estimate

In general, the noise environment in the immediate vicinity of the existing plant can be described as relatively noisy, due primarily to traffic on SR99. The noise environment at the nearest residence is more typical of residential areas, with no nearby discrete noise sources, and with background noise due to traffic on SR99.

[Insert NOISE: Figure 1]

Use AFC Figure 8.5-1

IMPACTS

Noise impacts associated with the project can be created by construction activities, and by normal long-term operation of the power plant. Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
NOISE – Would the project:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		X		
b) Exposure of persons to or generation of excessive ground borne vibration noise levels?				X
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?		X		
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		X		
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the area to excessive noise levels?				X

DISCUSSION OF IMPACTS

A. Noise in Excess of Standards or Ordinances: Less Than Significant with Mitigation Incorporated

GENERAL CONSTRUCTION NOISE

Construction noise is usually considered a temporary phenomenon. In this case, the construction period for the WGS2 will take place between Winter 2001 and Spring 2003. Construction of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours is commonly exempt from enforcement by local ordinances.

The Applicant has prepared a comprehensive analysis of construction noise impacts, listing predicted noise levels due to specific types of equipment and of generalized construction activities. The predicted average plant construction noise levels are summarized for the most-affected receptor locations during the busiest periods of construction in **NOISE Table 3**. It should be noted that these are conservative estimates, as the predictions did not account for shielding by intervening buildings.

**NOISE: Table 3
Construction Noise Level Predictions**

Receptor No.	Description	Daytime Ambient L_{eq} , dBA	Highest Construction Noise Level, dBA	Cumulative Noise Level, dBA	Change in Noise Level, dBA re: Ambient
1	1434 Louise Avenue	49-53	60	61	+8
2	Traveler's Motel	62-71	64	72	+1

The predicted plant construction sound levels would result in cumulative noise levels up to 8 dBA higher than under the ambient conditions at the nearest residence. However, the resulting cumulative noise level is within acceptable limits for short-term noise exposures. Because the increase in noise levels is of a temporary nature, and because construction noise will be restricted to daytime hours by Condition of Exemption **NOISE-8**, the noise effect of plant construction is considered to be insignificant.

POWER PLANT OPERATION

During its operating life, the WGS2 represents essentially a steady, continuous noise source day and night. Occasional brief increases in noise levels would occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or for maintenance, noise levels would decrease.

The primary noise sources anticipated from the facility include the steam turbine generator, gas turbine generator, heat recovery steam generator, transformers, boiler feed pumps, and the circulating water pumps. Secondary noise sources are anticipated to include pumps, ventilation fans and gas compressors. The noise emitted by power plants during normal operations is generally broadband, steady state in nature. The resulting hourly average noise levels are typically dominated by the steady-state noise sources.

The Applicant performed acoustical calculations to determine the facility noise emissions. The calculations were based on first-hand data and specific

manufacturer noise data for the major equipment planned for the facility (MID 2001, AFC § 8.5.4.2). Specific noise mitigation measures evaluated included:

- Combustion turbine inlet silencers
- Auxiliary boiler fan inlet silencers
- Turbine weather enclosures

The noise contours prepared from the noise level predictions are illustrated by **NOISE Figure 2**.

NOISE Table 4 lists the predicted project noise levels in terms of the background noise level (L_{90}) and estimated CNEL values.

NOISE: Table 4
Summary of Predicted Noise Levels

Measurement Sites	Nighttime L_{90} , dBA				CNEL, dB*
	Ambient	Project	Cumulative	Change	
1	39	37	41	+2	48
2	52	49	54	+2	61
3	48	46	50	+2	57
4	52	52	55	+3	62
5	48	34	48	0	55
6	57	47	57	0	64

* Energy Commission staff estimates

As a result of these analyses, Energy Commission staff believes that no significant noise impacts are likely to occur due to the operation of the project. The proposed Condition of Exemption **NOISE-6** would ensure that noise due to the plant operations would not exceed the standards of the City of Modesto Noise Element.

LINEAR FACILITIES

Reinforcements will be installed on the gas transmission lines, which are typically underground. The new 69 kV subtransmission line is not expected to produce a corona discharge hum. As a result, no noise impacts are expected to occur from linear facilities.

WORKER EFFECTS

The Applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and has committed to comply with applicable LORS. 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. The Applicant would implement a comprehensive hearing conservation program. To ensure that plant workers are adequately protected, Energy Commission staff has proposed Condition of Exemption **NOISE-7**.

[Insert NOISE: Figure 2 here]

Use AFC Figure 8.5-2.

B. Excessive Vibration: No Impact

The primary source of vibration noise associated with a power plant is the operation of the turbines. It is anticipated that the plant's turbines will be maintained in optimal balance to minimize excessive vibration that can cause damage or long term wear. Consequently, no excessive vibration would be experienced by adjacent land uses.

Another potential source of significant vibration is pile driving during construction. The Applicant has stated that pile driving will not be required for this project (MID 2001, AFC Page 8.5-16). Therefore no pile driving noise or vibration impacts are expected.

C. Permanent Increase in Ambient Noise Level: Less Than Significant with Mitigation Incorporated

POWER PLANT OPERATION

During its operating life, the WGS2 represents essentially a steady, continuous noise source day and night. Occasional brief increases in noise levels would occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or for maintenance, noise levels would decrease.

The primary noise sources anticipated from the facility include the steam turbine generator, gas turbine generator, heat recovery steam generator, transformers, boiler feed pumps, and the circulating water pumps. Secondary noise sources are anticipated to include pumps, ventilation fans and gas compressors. The noise emitted by power plants during normal operations is generally broadband, steady state in nature. The resulting hourly average noise levels are typically dominated by the steady-state noise sources.

The Applicant performed acoustical calculations to determine the facility noise emissions. The calculations were based on first-hand data and specific manufacturer noise data for the major equipment planned for the facility (MID 2001, AFC § 8.5.4.2). Specific noise mitigation measures evaluated included:

- Combustion turbine inlet silencers
- Auxiliary boiler fan inlet silencers
- Turbine weather enclosures

The noise contours prepared from the noise level predictions are illustrated by **NOISE Figure 2**.

NOISE Table 4 lists the predicted project noise levels in terms of the background noise level (L_{90}) and estimated CNEL values.

As a result of these analyses, Energy Commission staff believes that no significant noise impacts are likely to occur due to the operation of the project. The proposed Condition of Exemption **NOISE-6** would ensure that the background noise level (L_{90}) at the most-affected residential receptor would not increase by more than 5 dBA.

D. Substantial Temporary Increase in Noise Level: Less Than Significant with Mitigation Incorporated

GENERAL CONSTRUCTION NOISE

Construction noise is usually considered a temporary phenomenon. In this case, the construction period for the WGS2 will take place between Winter 2001 and Spring 2003. Construction of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours is commonly exempt from enforcement by local ordinances.

The Applicant has prepared a comprehensive analysis of construction noise impacts, listing predicted noise levels due to specific types of equipment and of generalized construction activities. The predicted average plant construction noise levels are summarized for the most-affected receptor locations during the busiest periods of construction in **NOISE Table 3**. These are conservative estimates, as the predictions did not account for shielding by intervening buildings.

The predicted plant construction sound levels would result in cumulative noise levels up to 8 dBA higher than under the ambient conditions at the nearest residence. However, the resulting cumulative noise level is within acceptable limits for short-term noise exposures. Because the increase in noise levels is of a temporary nature, and because construction noise will be restricted to daytime hours by Condition of Exemption **NOISE-8**, the noise effect of plant construction is considered to be insignificant.

STEAM BLOWS

Typically, the steam blows during construction and start-up create the loudest noise encountered during the construction phase. Steam blows are necessary after erection and assembly of the feed water and steam systems because the piping and tubing that comprises the steam path accumulate dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were to start up without thoroughly cleaning out the piping and tubing, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. High-pressure steam is then raised in the heat recovery steam generator (HRSG) or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, is performed several

times daily over a period of two or three weeks. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation.

According to the Applicant, un-silenced steam blow noise levels could be as high as 96 to 100 dBA at the nearest receivers (M1 and M2). With appropriate vent silencers, the noise levels could be reduced by 40 to 45 dBA, or to a level ranging from 54 to 60 dBA at the nearest receptors (MID 2001, AFC Page 8.5-16).

The Applicant has proposed to mitigate the noise generated from construction steam blows by use of a temporary blowout silencer. Energy Commission staff proposes that any high pressure steam blows be muffled with an appropriate silencer, and that they be performed only during daytime hours to minimize annoyance to residents (see proposed Condition of Exemption **NOISE-4** below).

Energy Commission staff further proposes a notification process to make neighbors aware of scheduled steam blows (see proposed Condition of Exemption **NOISE-5** below).

LINEAR FACILITIES

The project will include installation of a 69 kV subtransmission line over a distance of 1.2 miles, which will be adjacent to residential areas in the City of Modesto. The project also includes reinforcements to the existing gas transmission lines.

Construction of the linear facilities will produce noise, due to the operation of heavy powered equipment. The Applicant has provided a listing of typical construction equipment, and the expected noise levels at a reference distance of 50 feet. In addition, the Applicant stated that the horizontal drilling equipment used in reinforcing the gas lines is expected to produce noise levels similar to other diesel-powered equipment. The use of powered equipment in proximity to residences, as expected in the cities of Modesto and Ripon, will cause increases in ambient noise levels. However, because the increase in noise levels is of a temporary nature, and because construction noise will be restricted to daytime hours by Condition of Exemption **NOISE-8**, the noise effect of linear facilities construction is considered to be insignificant.

TONAL AND INTERMITTENT NOISES

One possible source of annoyance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. The Applicant has not indicated that any strong tonal noises will be generated during the operation of the project.

The Applicant has not determined that noise control steam system vent silencers will be required to mitigate the intermittent noise from pressure relief valves. Emergency pressure safety valve (PSV) discharges would not be silenced. These safety devices are typically not silenced, and produce noise only under emergency conditions. Because these noise sources are expected to be in compliance with the LORS, their noise effects are considered to be insignificant.

To ensure that no strong tonal noises are present and that intermittent noises are mitigated, Energy Commission staff has proposed a Condition of Exemption (see **NOISE-6**, below), which requires the Applicant to mitigate pure tones and the noise from steam relief valves.

WORKER EFFECTS

The Applicant acknowledges the need to protect construction workers from noise hazards. The Applicant recognizes the applicable LORS that would protect construction workers, and commits in general to complying with them (MID 2001, AFC § 8.5.2.1). To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Exemption **NOISE-3**.

E. Airport Noise Impacts: No Impact

The project is not within an airport zone. Therefore there are no impacts related to noise near an airport.

F. Private Airstrip Impacts: No Impact

The project is not near a private airstrip, therefore there would be no impacts related to private airstrips.

CUMULATIVE IMPACTS

Section 15130 of the CEQA Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The *CEQA Guidelines* require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

There are no known planned projects that could contribute to cumulative noise impacts in the project study area identified in the AFC. There are existing industrial noise sources near the project site which could contribute to the cumulative noise levels at certain receptors. In addition, traffic noise levels are significant in the SR 99 corridor, and may increase over time. The effects of noise produced by those sources have been accounted for by the ambient noise level measurements, and the resulting noise levels are described in the noise level predictions listed above.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Energy Commission staff concludes that the WGS2 will be built and operated to comply with all applicable noise laws, ordinances, regulations, and standards. Energy Commission staff further concludes that if the WGS2 facility were designed as described above, and further mitigated as described below in the proposed Conditions of Exemption, it is not expected to produce significant adverse noise impacts.

RECOMMENDATION

To ensure compliance with all applicable noise LORS, Energy Commission staff recommends adoption of the following proposed Conditions of Exemption.

PROPOSED CONDITIONS OF EXEMPTION

NOISE-1 At least 15 days prior to the start of project-related ground disturbing activities, the project owner shall notify all residents within one-half mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: The project owner shall transmit to the Energy Commission Compliance Project Manager (CPM) in the first Monthly Construction Report following the start of project-related ground disturbing activities, a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints.

Protocol: The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (see Exhibit 1), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;

- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to determine the source of noise related to the complaint;
- If the noise is project related, take all feasible measures to reduce the noise at its source; and
- Submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and, if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the City of Modesto Planning Department, and with the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 30-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.

NOISE-3 Prior to the start of project-related ground disturbing activities, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days prior to the start of project-related ground disturbing activities, the project owner shall submit to the CPM the above referenced program. The project owner shall make the program available to OSHA upon request.

NOISE-4 If a traditional, high-pressure steam blow process is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 60 dBA, measured at the M1 monitoring site, or at any other residential receptor. The project owner shall conduct steam blows only on weekdays during the hours of 7 a.m. to 9 p.m., unless the CPM agrees to longer hours based on a demonstration by the project owner that off-site noise impacts will not cause annoyance. If a low-pressure continuous steam blow process is employed, the project owner shall submit a description of this process, with expected noise levels and projected period of execution, to the CPM, who shall review the proposal with the objective of ensuring that the resulting noise levels at the nearest sensitive receptor do not exceed the ambient L_{90} plus 5 dBA. If the low-pressure process is approved by the CPM, the project owner shall implement it in accordance with the requirements of the CPM.

Verification: At least 15 days prior to the first high-pressure steam blow, the project owner shall submit to the CPM and the City of Modesto drawings or other information describing the temporary steam blow silencer and the noise levels expected, and a description of the steam blow schedule. At least 15 days prior to any low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the projected time schedule for execution of the process.

NOISE-5 At least 15 days prior to the first steam blow(s), the project owner shall notify the City of Modesto and all residents within one mile of the site of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected sound levels, and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: Within 5 days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam blow activities, including a description of the method(s) of that notification.

NOISE-6 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that operation of the project will not cause resultant noise levels to exceed the ambient background noise level (L_{90}) at residential receivers by more than 5 dBA, and that the noise due to plant operations will comply with the noise standards of the City of Modesto Noise Element.

No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints. The production of pure tones during normal plant operation is not allowed.

Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct short-term survey noise measurements at the M3, M4, M5 and M6 monitoring sites. In addition, the Applicant shall conduct a 25-hour community noise survey at monitoring sites M1 and M2. The survey during power plant operations shall also include measurement of one-third octave band sound pressure levels at each of the above locations to ensure that no new pure-tone noise components have been introduced.

If the results from the two noise surveys (pre-construction vs. operations) indicate that the average background noise level (L_{90}) at the most affected receptor has increased by more than 5 dBA for any given 4-hour period during the 25-hour period, or that the noise standards of the City of Modesto Noise Element have been exceeded, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits. If any

pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: Within 15 days after completing the survey, the project owner shall submit a summary report of the survey to the City of Modesto Planning Department, and to the CPM. Included in the report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 15 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE-7 Within 30 days after the facility is in full operation, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

NOISE-8 Heavy equipment operation and noisy construction or demolition work shall be restricted to the times of day delineated below:

Weekdays	7 a.m. to 7 p.m.
Weekends and Holidays	9 a.m. to 6 p.m.

Horizontal drilling equipment and other engine-powered construction equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Woodland Generation Station Unit 2 Project
(01-SPPE-1)

NOISE COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____

Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

Initial noise levels at 3 feet from noise source _____ dBA Date:

_____ dBA Date:

Initial noise levels at complainant's property: _____

Final noise levels at 3 feet from noise source: _____ dBA Date:

_____ dBA Date:

Final noise levels at complainant's property: _____

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

Approximate installed cost of corrective measures: \$ _____

Date installation completed: _____

Date first letter sent to complainant: _____ (copy attached)

Date final letter sent to complainant: _____ (copy attached)

This information is certified to be correct:

Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required).

REFERENCES

- Barnes, J.D., L.N. Miller, and E.W. Wood. 1976. *Prediction of Noise from Power Plant Construction*. Bolt Beranek and Newman, Inc., Cambridge, Massachusetts. Prepared for Empire State Electric Energy Research Corporation, Schenectady, New York.
- Beranek, L.L., I.L. Ver. 1992. *Noise and Vibration Control Engineering: Principles and Applications*. John Wiley and Sons, August.
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- City of Modesto. 1995. Noise Element of the City of Modesto General Plan, 1995.
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- Kryter, Karl D. *The Effects of Noise on Man*. Academic Press, N.Y., 1970.
- Miller, L.N., E.W. Wood, R.M. Hoover, A.R. Thompson, and S.L. Paterson. 1978. *Electric Power Plant Environmental Noise Guide, Volume 1*. Bolt Beranek and Newman, Inc., Cambridge, Massachusetts. Prepared for Edison Electric Institute, New York, New York.
- Peterson and Gross (Peterson, Arnold P. G. and Ervin E. Gross, Jr.). *Handbook of Noise Measurement, 7th ed.* GenRad, Concord, MA., 1974.
- Smith, B.J., R.J. Peters, S. Owens. 1996. *Acoustics and Noise Control, 2nd Edition*. Addison-Wesley. November.
- State of California. 1990. General Plan Guidelines, Office of Planning and Research, June 1990.
- U.S. EPA. 1971. *Community Noise*. Washington D.C., December 1971.
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PUBLIC HEALTH

Testimony of William Walters

INTRODUCTION

Operating the proposed WGS2 would create combustion products and expose the general public and workers to these pollutants, as well as possibly expose the general public and workers to the toxic chemicals associated with other aspects of facility operations. The purpose of this public health analysis is to determine whether a significant health risk would result from public exposure to these chemicals and combustion by-products routinely emitted during project operations.

The primary concern in this section is exposure to pollutants for which no air quality standards have been established. These are known as noncriteria pollutants, toxic air contaminants (TACs), or air toxics. Those for which ambient air quality standards have been established are known as criteria pollutants and are assessed in the Air Quality section.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

CLEAN AIR ACT SECTION 112 (42 U.S. CODE SECTION 7412)

Section 112 requires new sources which emit more than ten 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 (MACT).

STATE

CALIFORNIA HEALTH AND SAFETY CODE SECTIONS 39650 ET SEQ.

These sections mandate the Air Resources Board and the Department of Health Services to establish safe exposure limits for toxic air pollutants and identify pertinent best available control technologies. They also require that the new source review rule for each air pollution control district include regulations that require new or modified procedures for controlling the emission of toxic air contaminants.

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.”

LOCAL

The San Joaquin Valley Air Pollution Control District (SJVAPCD, or the District) has no specific rules implementing Health and Safety Code section 44300, or any other air toxics regulations that apply to the WGS2 project. The District does, however, have a written "Risk Management Policy for Permitting New and Modified Sources" that specifies its air toxics permitting requirements for new or modified air pollution source (SJVAPCD 2001). This policy includes project health risk assessment requirements and criteria and standards for the installation of Best Available Control Equipment for Toxics (T-BACT). The WGS2 project completed a health risk assessment that documents compliance with the allowable risk criteria of this policy, and does not trigger T-BACT requirements. Regardless, the exclusive use of natural gas and the carbon monoxide (CO) catalyst would likely meet T-BACT requirements. Therefore, the WGS2 project is in compliance with the District's air toxic permitting requirements.

SETTING

According to information provided by the Applicant (MID, 2001a, pg 2-1), the proposed facility will be located on a 2.5-acre site within Modesto city limits in Stanislaus County. The site is located adjacent to the existing Woodland 1 facility. The area immediately surrounding the site is sparsely populated as it is primarily zoned for industrial uses. The nearest residences are located slightly more than ¼ mile to the east-northeast of the site, and there also is a single residence slightly more than ¼ mile to the west of the site. The nearest locations with sensitive receptors (such as children and the elderly) are located more than ½ mile from the site, so exposures would not affect sensitive individuals at higher rates than the general population. These sensitive individuals are usually more susceptible than the general population to the effects of environmental pollutants. Therefore, extra consideration is given to possible effects in these individuals in establishing exposure limits for environmental pollutants.

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
PUBLIC HEALTH -- Would the project's operation:				
a) Cause the surrounding population to be exposed to toxic pollutants at levels hazardous to health?			X	

DISCUSSION OF IMPACTS

A. Population Exposure to Toxic Pollutants: Less Than Significant Impact

The Applicant used the California Toxic Emissions Factors (CATEF) Database (ARB 2001a) to determine the WGS2 gas turbine TAC emissions and a mass balance approach to determine the cooling tower TAC emissions. The Applicant then modeled the WGS2 estimated TAC emissions using ARB's Health Risk Assessment (HRA) Computer Program (version 2.0e) to determine the potential health risk from operation of the facility (ARB 2001b). Additionally, the Applicant performed estimated risk from diesel particulate that will be emitted during on-site construction activities.

The initial modeling analysis conducted by the Applicant (MID 2001a, Appendix 8.1-3) slightly overestimated the risk from the WGS2 facility as it did not include polycyclic aromatic hydrocarbon (PAH) potency equivalency factors (OEHHA 1999) when estimating risk from PAH as benzo(a)pyrene. Staff performed a separate analysis of the WGS2 TAC risk. The Applicant's estimated site risk values and staff's estimated risk values are presented in **Public Health Table 1**.

PUBLIC HEALTH: Table 1
WGS2 Project Toxic Air Contaminant Risk Values Maximum Exposed Individual Applicant and Staff Modeling Results*

	Applicant's Results	Staff Results	Significance Threshold
Individual Cancer Risk	0.9 x 10 ⁻⁶	0.38 x 10 ⁻⁶	10 x 10 ⁻⁶
Chronic Health Risk	0.43	0.22	1
Acute Health Risk	0.4	0.37	1

* Risk of getting cancer per million people.

The maximum cancer risk for this facility was determined to be 0.38 in a million for all of the project's carcinogens. This estimate is less than the one in a million cancer risk which staff and the District consider to be de minimis for sources such as WGS2, and considerably less than the ten in a million which staff and the District considers to be significant (District 2001). This means that the project's operation would be unlikely to pose a significant cancer risk to the surrounding population. The District's significance criteria of 10 in a million for a source (such as WGS2) requires that the source has first applied best available control technology for air toxics (T-BACT).

A chronic hazard index of 0.22 was calculated for the project's non-carcinogenic pollutants considered together. Their acute hazard index was calculated to be 0.37. Staff and the District both consider chronic and acute hazard indices of 1 to be significance levels for sources such as WGS2. The modeled chronic and acute hazard index values are well below the level of significance for the health effects involved.

The Applicant also performed an analysis of the potential health risk from use of construction diesel fuel (MID 2001a, Appendix 8.1-4). This analysis concluded that the maximum worker risk would be at or below one in one million.

As described in the Socioeconomics analysis, there is one census tract approximately two miles south of the proposed WGS2 site that contains a minority and local income community that meets the environmental justice criteria. However, because the proposed project would comply with all regulatory requirements with regard to air quality and no significant public health impacts are anticipated, the project will not have adverse impacts on this community, disproportionate or otherwise.

CUMULATIVE IMPACTS

Staff concludes that cumulative impacts would be less than significant, since there are no major sources of toxic air contaminants nearby.

CONCLUSIONS

While specific toxic pollutants would be associated with operation of the proposed project, staff's analysis shows that it will be unlikely for these pollutants to be emitted at levels posing any significant impact to the surrounding population. The maximum impact location occurs where pollutant concentrations from WGS2 would theoretically be the highest. Even at this location, staff does not expect any significant change in lifetime risk to any person, and the increase does not represent any real contribution to the total ambient risk. Modeled facility-related risks are lower at all other locations, and actual risks are expected to be much lower, since worst-case estimates are based on conservative assumptions, and overstate the true magnitude of the risk expected. Therefore, staff does not consider the incremental impact of the additional risk posed by the WGS2 project to be either significant or cumulatively considerable.

Additionally, the Applicant is proposing the exclusive use of natural gas fuel, is incorporating a CO catalyst on the HRSG, and is also proposing the use of a high efficiency drift eliminator on the cooling tower, which would be considered T-BACT for this project. Therefore, staff does not consider additional mitigation to be necessary.

PROPOSED CONDITIONS OF EXEMPTION

None proposed.

REFERENCES

- California Air Resources Board (CARB). 2001a. California Toxic Emissions Factors (CATEF) Database. http://www.arb.ca.gov/app/emsinv/catef_form.html
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- California Air Pollution Control Officers Association (CAPCOA) 1993. Air Toxics "Hot Spots" Program, Revised 1992 Risk Assessment Guidelines. Prepared by the Toxics Committee, October 1993.
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- MID (Modesto Irrigation District). 2001a. Application for Small Power Plant Exemption, Woodland Generating Station 2 Project (01-SPPE-1). Submitted to the California Energy Commission, May 4, 2001.
- Office of Environmental Health Hazard Assessment (OEHHA). 1999. Air Toxics Hot Spots Program Risk Assessment Guidelines, Part II Technical Support Document for Describing Available Cancer Potency Factors. April 1999.
- San Joaquin Valley Air Pollution Control District (District) 2001. Risk Management Policy for Permitting New and Modified Sources. Revised March 2, 2001.

SOCIOECONOMICS

Testimony of Michael Fajans

INTRODUCTION

The technical area of socioeconomic includes several related areas of interest and concern. A typical socioeconomic impact analysis evaluates the effects of short-term and long-term project-related population changes on local schools, medical and protective services, as well as the fiscal and physical capability of local governmental agencies to meet the needs of project-related changes in population. The socioeconomic analysis also provides demographic data for use in various other technical area analyses to determine if there may be Environmental Justice impacts.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

Executive Order 12898, "Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on 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.

STATE

14 CALIFORNIA CODE OF REGULATIONS, SECTION 15131

- Economic or social effects of a project shall not be treated as significant effects on the environment.
- Economic or social factors of a project may be used to determine the significance of physical changes caused by the project.
- Economic, social and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce and or avoid the significant effects on the environment.

SETTING

DEMOGRAPHIC CHARACTERISTICS

The project site is located in the City of Modesto in Stanislaus County and in unincorporated San Joaquin County. Located in the northern San Joaquin Valley, Stanislaus County is bounded by San Joaquin County on the north, Calaveras and Tuolumne Counties on the east, Merced County on the south, and Santa Clara County on the west. Adjacent to the nine-county Bay Area, Stanislaus County has been receiving spillover growth from the Bay Area's economic growth, with people moving to the county and commuting to jobs in Alameda, Contra Costa, and Santa Clara Counties. As a result, Stanislaus County population grew 21 percent from 1990 to 2000, to a population of 447,000. Modesto is the county seat and largest city in Stanislaus County, with a population of approximately 189,000 in Year 2000, accounting for 42 percent of the county's population. Although its 1990 to 2000 growth rate grew more modestly than that of the county, Modesto's 15 percent growth is still substantial for a city of its size. According to official estimates, Stanislaus County's population is expected to exceed 700,000 by 2020.

The growth rate in San Joaquin County has been comparable to that in Stanislaus County. San Joaquin County has grown 17 percent during the decade. The City of Ripon is a smaller community with a very substantial rate of growth, having grown from 7,500 to just over 10,000 people from 1990 to 2000.

Socioeconomics Table 1 shows the 1990 population, percentage of population of color, and percent of the population below the poverty level for the counties, the City of Modesto, and census tracts within a one-mile, two-mile, and six-mile radius of the proposed project. The six-mile radius includes an area larger than the City of Modesto. The 2000 population and proportion of people of color are shown as well. The poverty statistics are not yet available from the 2000 Census. In reviewing the table, there is little variation in the proportion of people of color within the various radii of the proposed project.

SOCIOECONOMICS: Table 1
Demographic Profile Of San Joaquin County, Stanislaus County,
Modesto, and Ripon: 1990 & 2000

Area	1990 Population	1990 % poverty	1990 % Color	2000 Population	2000 % Color
San Joaquin County	480,628	15%	41%	563,598	52%
Stanislaus County	370,522	14%	29%	446,997	43%
Modesto	164,746	13%	27%	188,856	40%
Ripon	7,455	5%	15%	10,146	23%
6-mile radius	256,651	14%	20%	295,088	28%
2-mile radius	82,586	18%	25%	88,096	27%
1-mile radius	34,326	17%	25%	36,987	22%

Source: US Census, 1990 & 2000

The proportion of the population below the poverty level was 18 percent within two miles of the site in 1990, only slightly higher than the 13 percent for the City of Modesto. However, there was one census tract within a mile of the site that had 52 percent of the population living below the poverty level, tract 17 southwest of downtown Modesto (between the railroad and State Route 99). The same tract and adjacent tract 1601 also had a majority of population of color, approximately 73 percent in 1990. However, by the 2000 census, the proportion of people of color decreased to less than 50 percent for these tracts, and the overall proportion of people of color decreased within one mile of the project site (from 25 percent to 22 percent) while increasing slightly in the broader area.

EMPLOYMENT AND ECONOMY

February 2001 statistics indicate a civilian labor force of 203,000 with an unemployment rate of 11.3 percent. In 1999, the unemployment rate in Stanislaus County was 10.6 percent, double the state's unemployment rate of 5.2 percent (EDD).

Services employ the highest proportion of any sector (23 percent), while trade accounts for another 18 percent of employment. Manufacturing accounts for 16 percent of jobs, government 15 percent, agriculture 10 percent, and construction approximately five percent. The construction sector employs about 10,000 workers in Stanislaus County.

SOCIOECONOMICS: Table 2
Labor Force Characteristics in San Joaquin and Stanislaus Counties, Feb. 2001

	San Joaquin County	Stanislaus County
Civilian labor force	257,900	203,500
Unemployment	25,400	23,800
Agriculture	12,100	11,300
Construction	11,700	10,200
Manufacturing	23,700	24,500
Transportation/public utilities	13,900	5,700
Trade	43,700	36,900
Finance/insurance	8,600	4,800
Services	47,900	38,400
Government	37,800	24,200

Source: California Employment Development Dept., March 2000 benchmark.

As illustrated in **Socioeconomics Table 2**, adjacent San Joaquin County has an additional 258,000-person civilian labor force, with 10 percent unemployment and similar distribution by sector, including almost 12,000 workers in the construction trades.

For major construction projects, the labor pool within a 90-minute commute includes Sacramento, Contra Costa, and Alameda Counties. These areas have large populations, including a labor force with adequate members of the trades required for construction of an energy facility.

PROJECT WORK FORCE

CONSTRUCTION WORK FORCE

According to the SPPE application, the construction of the WGS2 plant would require 17 months of labor, average 72 workers on-site, and require a maximum of 97 workers during the eighth and ninth months of construction. The tentative schedule would include construction initiation in November 2001 with completion in June 2003 (SPPE, page 8.8-8). Key trades involved (10 or more workers) would include boilermakers, electricians, ironworkers, millwrights, and pipefitters. In addition, the general contractor and MID would have a staff of five to 11 workers on-site for most of the construction period. **Socioeconomics Table 3** shows the distribution of workers by craft and month required for the construction. According to the SPPE, there is sufficient labor force availability in the Modesto area to find the required construction trades. The adjacent Northern San Joaquin Valley, Sacramento Valley, and Bay Area labor pools are also available for construction.

Project-related gas pipeline reinforcements would be located in San Joaquin County and the City of Ripon, just north of Stanislaus County. The gas pipeline reinforcement project would require an additional 41 to 71 workers during a seven-month span, from months five through 11 of the process. As shown in **Socioeconomics Table 4**, equipment operators and laborers would be the primary required trades, trades where relatively few workers are required for the plant itself.

PLANT OPERATIONS WORKFORCE

According to the Applicant, the WGS2 is expected to share most operating and maintenance staff with the adjacent existing plant (SPPE, page 8.8-8). Only three to four additional full-time employees will be required to operate the plant.

SOCIOECONOMICS: Table 3
Project Monthly Construction Labor By Craft: Plant

Job Category	Month of construction																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Boilermakers								15	15	10	10	10	10	5			
Bricklayers/ Masons								2	2	1							
Carpenters		6	6	6	5	2	2	9	9	9	2	1	1	1			
Electricians					5	5	12	15	15	15	12	12	12	12	5	2	2
Insulation workers												5	5	5	5	4	2
Ironworkers		6	6	6	5	3	2	10	10	10							
Laborers	2	6	6	6	5	5	4	7	7	7	5	5	4	3	2	2	2
Millwrights								5	5	10	10	4	2	1	1	1	
Management/ Supervision	3	3	3	3	3	3	3	4	4	4	4	4	4	4	3	1	1
Operating engineers	4	1	1	1	2	2	2	5	5	5	5	5	4	2	1	1	
Painters															4	2	2
Pipefitters					8	8	8	15	15	10	10	10	10	5	5	2	2
Plumbers		2	2	2						4	4	1					
Sheetmetal workers								3	3	1							
Surveyors	2	2	1	1	1	1	1										
Total construction Workforce	11	26	25	25	34	29	34	90	90	86	62	57	52	38	24	17	13
Total MID staff	5	5	5	5	5	6	6	7	7	7	7	7	7	7	11	9	9
Total Plant Workforce	16	31	30	30	39	35	40	97	97	93	69	64	59	45	35	26	22

Source: Modesto Irrigation District, 2001

**SOCIOECONOMICS: Table 4
Project Monthly Construction Labor By Craft: Pipeline**

Job Category	Month of Construction						
	5	6	7	8	9	10	11
Flagmen	3	3	3	3	3	3	4
Foremen	3	3	2	3	3	2	2
Equipment Operators	13	13	19	19	15	15	8
Laborers	17	18	28	28	22	21	16
Management/Office	3	4	3	4	4	3	2
Mechanics	1	2	2	2	1	1	1
Teamsters	6	6	6	6	5	5	6
Welders	3	3	6	6	5	4	2
Total Pipeline Workforce	49	52	69	71	58	54	41

Source: MID, 2001

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
SOCIOECONOMIC: POPULATION AND HOUSING -- Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X
d) Have a significant minority or low-income population within a six-mile radius that may be subject to disproportionate adverse effects of the project?				X
Result in substantial adverse physical impacts associated with the provision of new or physically altered facilities, the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios, response times, or other performance objectives for the following:				
e) fire protection?				X
f) police protection?				X
g) schools?				X
h) other public services?				X

DISCUSSION OF IMPACTS

A. Induced Population Growth: No Impact

The proposed WGS2 project will require approximately 17 months for construction with a peak construction period during the 8th through 10th months. Pipeline modifications will require seven months, from the 5th through 11th months. Total construction labor force will be approximately 145-170 workers for a three-month period, during months 8 through 10. The majority of construction workers are expected to be from the San Joaquin or Stanislaus County areas, with additional workers commuting daily from the Bay Area or Sacramento areas. Therefore, the project will not directly or indirectly induce substantial population growth in the area.

B. Displacement of Housing: No Impact

No housing will be displaced for the project. Sufficient vacant housing exists if any construction workers seek temporary housing. According to the State Department of Finance, there was a five percent housing vacancy rate in Stanislaus County in 2000, yielding over 7,500 available housing units (Department of Finance, 2000). Even if approximately 100 construction workers were to relocate to Stanislaus County for a short period, this would comprise only 0.02 percent of the estimated population base, and would have no impact on the housing supply.

The proposed WSG2 project is not likely to significantly alter the location, distribution, density, or growth rate of the population of Modesto, Stanislaus, or San Joaquin County since construction impacts are of short duration. Few additional workers will be needed to operate the project that will be adjacent to an existing power plant.

C. Displacement of People: No Impact

No housing or population will be displaced by the proposed project.

D. Adversely Affect Minority or Low-Income Populations: No Impact

The screening analysis shows that there is not a fifty-percent or greater minority or low-income population within a six mile radius of the proposed project. However, there is a small pocket of minority and low-income persons within two miles of the proposed project. Please see the Air Quality and Public Health sections of this document for the discussion of potential impacts.

E. Fire Service: No Impact

Because there will be no immigration of construction workers, staff does not expect significant impacts to fire services.

F. Police Protection: No Impact

Because there will be no immigration of construction workers, staff does not expect significant impacts to police services.

G. Schools: No Impact

Because there will be no immigration of construction workers, staff does not expect significant impacts to schools.

H. Other Public Services: No Impact

Because there will be no immigration of construction workers, staff does not expect significant impacts to other public services.

CUMULATIVE IMPACTS

Staff concludes that there are no cumulative impacts.

CONCLUSIONS

The proposed project would not induce significant population growth in the area, nor would it involve the displacement of housing or people. In addition, the project will not significantly impact schools or public services. Therefore, the project will not result in any significant socioeconomic impacts to population, housing, schools, or public services.

PROPOSED CONDITIONS OF EXEMPTION

None proposed.

REFERENCES

MID (Modesto Irrigation District). 2001a. Application for Small Power Plant Exemption, Woodland Generating Station 2 Project (01-SPPE-1). Submitted to the California Energy Commission, May 4, 2001.

MID (Modesto Irrigation District). 2001b. Gas Supply Line Modifications Modesto Irrigation District Project (01-SPPE-1). Submitted to the California Energy Commission, May 25, 2001.

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TRAFFIC & TRANSPORTATION

Testimony of Steven J. Brown, P.E.

INTRODUCTION

The traffic and transportation section of the Initial Study provides an independent analysis of the WGS2 project proposed by the Modesto Irrigation District (MID). Potential impacts related to traffic operations and safety hazards resulting from the construction and operation of the project are discussed.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Federal, state, and local regulations that are applicable to the proposed project are listed below. Included are regulations related to the transportation of hazardous materials, which are designed to control and mitigate for potential impacts. The Applicant has indicated its intent to comply with all federal, state, and local regulations related to the transport of hazardous materials. This issue is also addressed in the section entitled **HAZARDOUS MATERIALS**.

FEDERAL

- Title 49, Code of Federal Regulations, Sections 171-177, governs the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.
- Title 49, Code of Federal Regulations, Sections 350-399, and Appendices A-G, Federal Motor Carrier Safety Regulations, address safety considerations for the transport of goods, materials, and substances over public highways.

STATE

- Section 353 defines hazardous materials. California Vehicle Code, Sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- Sections 31600-31620 regulate the transportation of explosive materials.
- Sections 32000-32053 regulate the licensing of carriers of hazardous materials and include noticing requirements.
- Sections 32100-32109 establish special requirements for the transportation of substances presenting inhalation hazards and poisonous gases.
- Sections 34000-34121 establish special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5 and 34510-11 regulate the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- Sections 25160 et seq. addresses the safe transport of hazardous materials.

- Sections 2500-2505 authorize the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.
- Sections 13369, 15275, and 15278 address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, the possession of certificates permitting the operation of vehicles transporting hazardous materials is required.
- California Streets and Highways Code, Sections 117 and 660-72, and California Vehicle Code, Sections 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Street and Highways Code, Sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.

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

LOCAL

The 1995 City of Modesto Urban Area General Plan identifies roadway definitions, level of service standards, and other transportation modes including transit service, bicycle circulation network, inter-city rail service, and air service. The City of Modesto’s policies and Stanislaus County’s policies related to traffic and circulation needs are identified. The City of Modesto’s adopted level of service (LOS) standard of LOS D or better is identified.

SETTING

The major highways in the area of the project site are State Route 99 (SR), SR 108, and SR 132. The local roadways potentially affected by the proposed project are Kansas Avenue, Woodland Avenue, Graphics Drive, Carpenter Road, and 9th Street. These local roads would provide connections to the project site from SR 99.

The project site is located on Graphics Drive adjacent to the existing MID Woodland 1 facility. Graphics Drive extends from Kansas Avenue to Woodland Avenue in the City of Modesto. Near the project site, Graphics Drive is approximately 40 feet wide with two 20-foot travel lanes. This facility is classified as a collector roadway with an approximate roadway capacity of 12,000 vehicles per day. The proposed WGS2 site is served primarily from an access point on Graphics Drive just south of Woodland.

SR 99 is the primary north-south travel route in the project vicinity and is a six-lane highway providing access to the site via Kansas Avenue and Carpenter Avenue. SR 99 traverses the length of the City of Modesto and is under the jurisdiction of the California Department of Transportation (Caltrans). Between Kansas Avenue and Carpenter Avenue, SR 99 carries approximately 86,000 vehicles per day.

The proposed WGS2 site is located adjacent to the Union Pacific Railroad tracks, which cross Woodland Avenue directly east of the project near 9th Street. This railroad crossing is equipped with standard railroad grade crossing warning equipment.

This project would also include the construction of various linear facilities. Water pipelines are proposed to be installed along Kansas Avenue beginning at 9th Street west to Graphics Drive, then north on Graphics Drive to the project site. Two separate gas pipeline segments would be installed within the City of Ripon as well: 1) along East West Ripon Road beginning at S. Austin Road, east to Jack Tone Road, then south to Doak Road, and 2) along Airport Way from Avenue D north to East West Ripon Road.

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
TRANSPORTATION/TRAFFIC -- Would the project:				
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?		X		
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?		X		
c) 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?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?		X		
e) Result in inadequate emergency access?				X
f) Result in inadequate parking capacity?				X
g) Create a significant hazard to the public or the environment through the routine transportation of hazardous material?		X		

DISCUSSION OF IMPACTS

A. Substantial Increase in Traffic: Less than Significant with Mitigation Incorporated

The project is expected to generate 78 daily trips (39 round trips) during the average construction period and 156 daily trips (78 round trips) during the peak construction period, which will last two months. Staff at the existing MID Woodland 1 Facility will provide most of the workforce under operation of the WGS2 site, although up to four additional full-time personnel will be required.

According to the City of Modesto Traffic Engineering Department, a project that generates 100 or more p.m. peak hour trips requires a traffic impact study. The WGS2 project would generate a maximum of 78 afternoon peak hour trips (during the peak construction period). The level of service at the Woodland Avenue/Graphics Drive intersection would deteriorate from level of service (LOS) D to LOS E operations during the morning peak hour with the addition of project construction traffic. This change in level of service indicates the potential for congestion at this intersection under 'existing plus project' conditions. Therefore, a construction traffic control plan and implementation program that limits construction-period truck and project-related commute traffic to off-peak periods in coordination with the City of Modesto and Caltrans should be developed to offset this project impact. The Applicant has indicated their intent to provide such a plan (see **Condition of Exemption TRANS-1**).

In addition, Set 1B of the Data Request Responses indicates that construction of linear facilities (i.e., gas/water pipelines, transmission lines) would include temporary traffic lane closures, thereby affecting the capacity of the following roadways:

- City of Modesto
 - Kansas Avenue (between 9th Street and Graphics Drive)
 - Graphics Drive (between Kansas Avenue and proposed WGS2 site)
- City of Ripon:
 - East West Ripon Road (between S. Austin Road and Jack Tone Road)
 - Jack Tone Road (between East West Ripon Road and Doak Blvd.)
 - Doak Road (between Jack Tone Road and Vera Avenue)

The applicant has indicated their intent to prepare a traffic control plan related to the construction of linear facilities, which will include a discussion on the use of flagmen and signage for temporary lane closures. In addition, this traffic control plan should include timing of linear facilities construction to take place outside peak traffic periods to avoid traffic flow disruptions.

B. Exceedance of Established Level of Service Standards: Less than Significant with Mitigation Incorporated

The addition of WGS2 project traffic will have little, if any effect on the existing average levels of service (LOS) on SR 99 (between Kansas Avenue and Carpenter

Avenue), or on 9th Street in the immediate vicinity of the proposed project site. Each of these facilities is expected to operate at an acceptable level of service (i.e., LOS D or better according to the City of Modesto Urban Area General Plan) with the addition of project construction traffic. These affected roadways will experience no significant and/or adverse impacts from this project as both have sufficient capacity to absorb all project-generated traffic.

However, the intersections of Woodland Avenue/Graphics Drive and Kansas Avenue/Graphics Drive will worsen to unacceptable service levels under 'existing plus project' conditions. The Woodland Avenue/Graphics Drive intersection will decrease from LOS D to LOS E operations during the a.m. peak hour, and the Kansas Avenue/Graphics Drive intersection will decrease from LOS E to LOS F operations during the p.m. peak hour. In addition, the segment of Woodland Avenue in the vicinity of the project site currently operates below the LOS D standard and will continue to operate at this level with the addition of the project.

Although these traffic impacts would only occur on a temporary basis (i.e., during the construction phase of the project), the development and implementation of a construction traffic control plan should be required to offset these impacts (see **Condition of Exemption TRANS-1**).

Decrease in service levels resulting from temporary lane closures related to construction of linear facilities would also require the development and implementation of a construction traffic control plan to offsets these traffic impacts.

No traffic impacts would result during operation of the WGS2 since a negligible amount of additional employee trips (i.e., up to 4 additional trips) are expected.

C. Change in Air Traffic Patterns: No Impact

The WGS2 has no major commercial aviation center in the area. The closest airport is the Modesto City-County Airport that is approximately five miles from the proposed project site. The stack height will not penetrate the aviation "regulatory surface" as defined by the Federal Aviation Administration (FAA); therefore, the WGS2 should not impact air traffic safety.

D. Substantial Increase in Traffic Hazards: Less than Significant with Mitigation Incorporated

Staff observations of the project area indicate that a traffic operation problem or hazard could occur at the intersection of Kansas Avenue/Graphics Drive due to its proximity to the signalized intersection of Kansas Avenue/SR 99 Northbound ramps. These intersections are spaced approximately 225 feet apart (from the centerline of Graphics Drive to the crosswalk on the western leg of the Kansas Avenue/SR 99 Northbound ramps intersection). Significant delays and traffic congestion (i.e., blockage of through traffic) will likely occur with heavy construction vehicles attempting to access the northbound SR 99 loop-ramp from Graphics Drive. Vehicles transporting hazardous materials that attempt to make this turning movement will also affect public safety. In addition, the water line construction will occur at and through this same intersection.

According to the SPPE application, one of the proposed access and truck routes to the project site would be from Graphics Drive to Kansas Drive to SR 99. In order to mitigate this potential hazard impact, the construction traffic control and implementation program should specifically limit all heavy vehicles and vehicles transporting hazardous materials traveling from the project site heading northbound on SR 99 to use Woodland Avenue west, to Carpenter Avenue north, to SR 99 (see **Condition of Exemption TRANS-1**).

Immediate access to the WGS2 site would be provided directly from Graphics Drive. Although left-turn lanes are not provided for vehicles turning left into the site, excessive delays are not expected from this movement due to the relatively low level of existing traffic on Graphics Drive.

The Applicant has indicated its intent to comply with all weight and load limitations on state and local roadways.

E. Inadequate Emergency Access: No Impact

The project will not lead to inadequate emergency access, because intersections impacted by construction will be maintained at an acceptable service level to Caltrans and the City of Modesto with the implementation of a construction traffic control plan. Therefore, no traffic congestion affecting emergency access is expected on Woodland Avenue or Kansas Avenue near the project site or along Graphics Drive.

The Applicant has also indicated their intent to maintain emergency access on applicable roadways during construction of linear facilities.

F. Inadequate Parking Capacity: No Impact

Ample parking for construction site personnel and visitors will be provided in laydown areas owned or leased by MID adjacent to the site: on the west side of Graphics Drive, just south of the project site (on Graphics Drive) and northwest of the site across Woodland Avenue.

G. Transportation of Hazardous Material: Less than Significant with Mitigation Incorporated

The construction and operation of the plant will require the transportation of various hazardous materials, including: aqueous ammonia, solvents, lube oils, paint, paint thinners, adhesives, batteries, construction gases, etc. The transport of hazardous materials over city streets has the potential to result in an increase in traffic hazards. WGS2 has indicated that the transportation of hazardous materials to and from the site will be conducted in accordance with California Vehicle Code Section 31300. If the Applicant follows the LORS for handling and transportation of hazardous materials (as discussed further in the Hazardous Materials section of the Initial Study), and the Applicant develops and implements a construction traffic control plan prohibiting left-turn movements onto Kansas Avenue from Graphics Drive for vehicles transporting hazardous materials, no significant impact is expected.

CUMULATIVE IMPACTS

Although three proposed projects have been identified to occur in the vicinity of the proposed WGS2 project (i.e., Modesto Junior College Commercial Project, the Northwest Business Park Project, and the FMC Corp Alkali property project), construction schedules for these projects have not been determined as they are still in the early planning stages. However, based on the SPPE application, it is unlikely that construction, material deliveries, or workforce commute related to these projects would occur during the same period as for the WGS2 project. Therefore, staff concludes that there will be no significant cumulative impacts.

CONCLUSIONS

Provided that the Applicant develops a construction traffic control and implementation program and follows all LORS acceptable to Caltrans and the City of Modesto for the handling of hazardous materials, the project will result in less than significant impacts.

PROPOSED CONDITIONS OF EXEMPTION

TRANS-1 The project owner shall develop a construction traffic control and transportation demand implementation program that limits construction-period truck and commute traffic to off-peak periods in coordination with the City of Modesto and Caltrans. Specifically, this plan shall include the following restrictions on construction traffic:

- establish construction work hours outside of the peak traffic periods to ensure that construction workforce traffic occurs during off-peak hours;
- schedule heavy vehicle equipment and building materials deliveries to occur during off-peak hours; and
- route all heavy vehicles and vehicles transporting hazardous materials headed northbound on SR 99 from Graphics Drive to Kansas Avenue west to Carpenter Avenue north to SR 99. Prohibit these vehicles from making left-turns from Graphics Drive onto eastbound Kansas Avenue.

The construction traffic control and transportation demand implementation program shall also include the following restrictions on construction traffic addressing the following issues for linear facilities:

- timing of pipeline construction (all pipeline construction affecting county roads shall take place outside the peak traffic periods to avoid traffic flow disruptions);
- signing, lighting, and traffic control device placement;
- temporary travel lane closures;
- maintaining access to adjacent residential and commercial properties; and
- emergency access.

Verification: At least 30 days prior to start of site preparation or earth moving activities, the project owner shall provide to the City of Modesto and Caltrans for review and comment, and to the CPM for review and approval, a copy of their construction traffic control plan and transportation demand implementation program.

TRANS-2 The project owner shall ensure that all federal and state regulations for the transportation of hazardous materials are observed.

Verification: The project owner shall include in its Monthly Compliance Reports copies of all permits and licenses acquired by the project owner and/or subcontractors concerning the transportation of hazardous substances.

REFERENCES

MID (Modesto Irrigation District). 2001a. Application for Small Power Plant Exemption, Woodland Generating Station 2 Project (01-SPPE-1). Submitted to the California Energy Commission, May 4, 2001

MID (Modesto Irrigation District). 2001b. Gas Supply Line Modifications Modesto Irrigation District Project (01-SPPE-1). Submitted to the California Energy Commission, May 25, 2001.

MID (Modesto Irrigation District). 2001d. Data Requests and Responses – Set 1B (Data Requests Nos. 2-9, 11, 13-22, 25-38) Submitted to the California Energy Commission, June 15, 2001.

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Murphy, Mark. City of Modesto Traffic Engineering. Telephone conversation on June 18, 2001.

TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

INTRODUCTION

The WGS2 project is proposed by the Applicant (MID) for a 2.5-acre parcel within the site of the Applicant's existing Woodland 1 facility in Modesto, California. According to information from the Applicant (MID 2001a, pgs. 1-1, 1-2, 2-1, 5-4 through 5-6, and Appendix 1-2), the project's power delivery line will be a 1.2-mile 69 kV overhead subtransmission line extending from the existing on-site substation to MID's 69 kV Enslin Substation approximately one mile to the east. The route was chosen to ensure placement within existing street, railroad, and power line rights-of-way (ROWs), as is present state policy. After delivery to the Enslin Substation, the project's power will then be delivered to the PG&E power grid through existing PG&E transmission lines. As detailed by the Applicant, some of the lines within the project-to-Enslin ROW will have to be modified to accommodate the placement of this new WGS2 line. In some locations along the route, such modification will involve locating the proposed line and existing 12 kV distribution lines on common replacement support poles. The structure of these pole supports and line configurations have been provided by the Applicant as related to electric and magnetic field (EMF) reduction efficiency (MID 2001a, p. 5-13). The combined site for the two generating facilities (Woodland 1 and WGS2) will be about 7 acres.

Since the proposed WGS2 line will be within the PG&E service area, it will be designed according to existing PG&E guidelines and construction practices reflecting compliance with applicable safety laws, ordinances, regulations, and standards (LORS), and California Public Utilities Commission's (CPUC) general orders on electric and magnetic field (EMF) reduction. As noted by the Applicant (MID 2001, p. 5-4), both the Applicant and the other California municipal utilities voluntarily comply with these CPUC general orders although they were specifically established by CPUC for utilities under CPUC regulation. Such voluntary compliance reflects the effort of the state's municipal utilities to facilitate a uniform handling of the EMF reduction issue. The purpose of this analysis is to assess the proposed line construction and operational plan for incorporation of the measures necessary for such compliance.

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

- Aviation safety;
- Interference with radio-frequency communication;
- Audible noise;
- Fire hazards;
- Hazardous shocks;
- Nuisance shocks; and

- Electric and magnetic field (EMF) exposure.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

AVIATION HAZARD

The physical presence of the proposed line could pose an aviation hazard to area aviation if the line protrudes high enough into the navigable air space or is located close enough to area airports. The potential for such a hazard is addressed through the following LORS:

- Title 14, Part 77 of the Federal Code of Regulations (CFR), “Objects Affecting the Navigation Space.” Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a “Notice of Proposed Construction or Alteration” is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid any significant hazards to area aviation.
- FAA Advisory Circular (AC) No. 70/460-2H, “Proposed Construction and or Alteration of Objects that may Affect the Navigation Space.” This circular informs each proponent of a project that could pose an aviation hazard of the need to file the “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA.

FAA AC No. 70/460-1G, “Obstruction Marking and Lighting.” This publication 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.

AUDIBLE NOISE AND RADIO INTERFERENCE

The physical interactions of electric fields from transmission lines could produce audible noise and interfere with radio-frequency communication in the area. Such impacts are prevented or mitigated through compliance with the following regulations and practices:

- Federal Communications Commission (FCC) regulations in Title 47 CFR, Section 15.25.
- General Order 52 (GO-52), California Public Utilities Commission (CPUC). Industry design standards and maintenance practices.

FIRE HAZARDS

Fire hazards from overhead transmission line operation are mostly related to sparks from conductors of overhead lines or direct contact between the line and nearby

trees and other combustible objects. Such fires are prevented through compliance with the following regulations

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

SHOCK HAZARD

All transmission and subtransmission line operations pose a risk of hazardous or nuisance shocks to humans. These hazardous shocks are those possible from direct or indirect contact between an individual and the energized line. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines. The nuisance shocks by contrast, are caused by current flow at levels generally incapable of causing significant physiological harm. They result most commonly from contact with a charged metallic object in the transmission line environment. The following regulations are intended to prevent such shocks:

- GO-95, CPUC. “Rules for Overhead Line Construction”. These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements ensures the safety of the general public and workers working on or around the line.
- Title 8, CCR, Section 2700 et seq., “High Voltage Electric Safety Orders”. These safety orders establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment.
- National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. Provisions of this code are intended to minimize the potential for direct or indirect contact with the energized line.

The National Electrical Safety Code and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE).

IMPACTS

Following is the Environmental Checklist that identifies potential impacts in this issue area. Below the checklist is a discussion of each impact, and an explanation of the impact conclusion.

ENVIRONMENTAL CHECKLIST

	Potentially Significant	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
TRANSMISSION LINE SAFETY AND NUISANCE -- Would project operation:				
a) Pose an aviation hazard to area aircraft?			X	
b) Lead to interference with radio-frequency communication?			X	
c) Pose a hazardous or nuisance shock hazard?			X	
d) Pose a fire hazard?			X	
e) Expose humans to higher electric and magnetic field levels than justified by existing knowledge?			X	

DISCUSSION OF IMPACTS

A. Aviation Hazard: Less Than Significant Impact

As noted by the Applicant (MID 2001a, p. 5-11), the proposed WGS2 project site is approximately 4 miles northwest of the Modesto Airport and 12 miles south of the Oakdale Airport. The Stockton Metropolitan Airport is 20 miles to the north. Staff agrees with the Applicant that the proposed line route is too far from area airports (according to existing FAA evaluative criteria) to pose a significant hazard to area aviation. This means that a Notice of Construction or Alteration would not be required. However, the Applicant will file this notice with the FAA as is customary for all new transmission lines.

B. Radio Frequency Interference: Less Than Significant Impact

As discussed by the Applicant (MID 2001a, p. 5-11), the electric fields from 69 kV lines are not strong enough to produce the radio noise or television interference that is possible from lines of 345 kV or higher (as noted by EPRI 1982). The Applicant specifically drew from their experience with the more than 200 miles of 69 kV lines they presently operate and concluded that no such noise or television interference would occur during operations. The Applicant, however, intends to mitigate any related complaints whenever they are lodged. Staff recommends a specific Condition of Exemption (**TLSN-2**) to ensure such mitigation.

C. Fire Hazard: Less Than Significant Impact

The Applicant (MID 2001a, pgs. 5-7 through 5-9) intends to comply with the requirements of applicable regulations and standards intended to prevent hazardous or nuisance shocks to humans. Staff's recommended Conditions of Exemption (**TLSN-1** and **TLSN-5**) will ensure such compliance.

D. Shock Hazard: Less Than Significant Impact

The issue of concern to staff is the likelihood of a fire hazard from operation of the proposed line. The Applicant (MID 2001a, p. 5-11) intends to comply with applicable regulations intended to ensure that the line is adequately located away from trees and other combustible objects and materials to prevent fires or minimize such fires when they occur. Staff recommends two Conditions of Exemption

(**TLSN-1** and **TLSN-4**) to ensure the distancing and fire prevention measures are met.

E. Electric and Magnetic Field Exposure: Less Than Significant Impact

Exposure to power-frequency electric and magnetic fields is considered by some researchers to be capable of biological impacts at high voltages. As noted by the Applicant (MID 2001a, p. 5-8), power line (i.e., less than 200 kV) fields have not been established as capable of significant biological effects in exposed humans. The CPUC has established specific design requirements for dealing with such fields in light of present knowledge. As previously noted, MID and the other California municipal utilities voluntarily comply with these requirements. The question of concern to staff is whether the proposed line's field reducing design is adequate to maintain possible human exposures within limits reflected in CPUC's requirements on the issue.

As noted by the Applicant (MID 2001a, pgs. 5-9 and 5-10), maximum electric field strengths will be 0.016 kV/m at the edge of the ROW and 0.69 kV/m around the facility switchyard when the proposed WGS2 and the existing Woodland 1 projects are operating. These field strengths are within the range for PG&E and MID lines of the same voltage. The maximum magnetic field strength will be approximately 63.7 milliGauss (mG) at the edge of the ROW. This calculated value would reflect the specific magnetic field reduction measures to be implemented when the proposed line is located alone or in the vicinity of other area lines (MID 2001, p. 5-10). The maximum strength around the modified substation will be 142.9 mG. These magnetic field strengths are within the range expected for PG&E lines of the same voltage and current-carrying capacity and are much lower than the limits established by the relatively few states with regulatory limits. Staff's recommended Conditions of Exemption (**TLSN-1** and **TLSN-3**) will ensure that the line's field strengths will be within the expected levels.

CONCLUSIONS

Staff has determined that the proposed line will be designed and operated in compliance with all applicable LORS. The following conditions of exemption are recommended to ensure implementation of the recommended design and operational measures.

PROPOSED CONDITIONS OF EXEMPTION

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

Thirty days before starting construction of the transmission line or related structures and facilities, the project owner shall submit to the Energy Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming compliance with this requirement.

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

The project owner shall maintain written records for a period of five years, of all complaints of radio or television interference attributable to operation together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notations on the corrective action taken. Complaints not leading to a specific action, or for which there was no resolution should be noted and explained. The record shall be signed by the project owner and also the complainant, if possible, to indicate concurrence with the corrective action or agreement, with the justification for a lack of action.

All reports of line-related complaints shall be summarized for the project-related lines and included during the first five years of plant operation in the Annual Compliance Report.

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

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

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

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

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

At least 30 days before the line is energized, the project owner shall submit a letter confirming compliance with this condition to the CPM.

REFERENCES

MID (Modesto Irrigation District) 2001a. Application for Small Power Exemption, Woodland Generating Station 2 Project (01-SPPE-1). Submitted to the California Energy Commission on May 4 2001.

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

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

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

TRANSMISSION SYSTEM ENGINEERING

Testimony of Ajoy Guha and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis provides the basis for the findings in the Energy Commission's decision. This staff assessment indicates whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations, and standards (LORS) required for safe and reliable electric power transmission.

Under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (CCR, tit. 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities required for the project's interconnection to the electric grid and also beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system. This staff assessment indicates whether or not the applicant has accurately identified all transmission facilities.

The Modesto Irrigation District (MID), the Applicant, filed for SPPE to request approval from the California Energy Commission to construct an 80 MW nominal natural gas-fired combined-cycle generating facility. The Applicant proposes to connect the WGS2 project to the existing MID transmission system, and unlike other applications, since the MID system is not a part of the California Independent System Operator (Cal-ISO) grid, the Cal-ISO is not responsible¹ for ensuring electric system reliability for the generator interconnection. Therefore, the Energy Commission is responsible for ensuring electric system reliability for the transmission owner, MID, and shall make its findings related to applicable reliability standards, the need for additional transmission facilities, and environmental review of the whole of the action.

Staff's analysis evaluates the power plant switchyard, outlet line, termination, and downstream facilities identified by the Applicant, and provides a proposed Condition of Exemption to ensure the project complies with applicable LORS during the operation of the project.

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

¹ The Cal-ISO would be concerned, however, if the generator interconnection would negatively affect the reliability of the adjacent Cal-ISO grid; staff concludes that it will not.

ensures adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.²

- Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 “Criteria for Transmission System Contingency Performance,” which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas during major disturbances (such as loss of all lines in a right-of-way (ROW)). While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).
- North American Electric Reliability Council (NERC) Planning Standards provides policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions. However, the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).

PROJECT DESCRIPTION

SWITCHYARD

The WGS2 site will be adjacent to and within the fenced yard of the existing MID Woodland 1 facility at Modesto, Stanislaus County, California. The WGS2 will consist of two units, one combustion turbine generator (47 MW gross capacity) and the other steam turbine generator (37 MW gross capacity) for a total nominal output of 80 MW. Both of the new generating units will be connected to a new 110 MVA 13.8/69 kV step-up transformer. The high voltage terminals of the transformer will be connected to the existing Woodland 1 69 kV switchyard by overhead conductors and a 5000 ampere circuit breaker. The Woodland 1 69 kV switchyard is configured

² The MID will voluntarily comply with GO-95 Rules although they are not under the jurisdiction of the CPUC.

with a main and a transfer bus, and with six bays each with a breaker connected to the main bus and with a disconnect switch connected to the transfer bus. Out of the existing six bays, one is carrying Woodland 1, four are carrying the existing 69 kV transmission lines, and one is lying spare for a new 69 kV line. The Woodland 1 69 kV switchyard will be enlarged by one bay to accommodate the new breaker for the WGS2 step-up transformer terminals and the ancillary disconnect switches (MID 2001a, SPPE pgs. 2.4.11, 2-13, and Figure 2-10). This configuration for the interconnection and switchyard is in accordance with good utility practices and is considered acceptable. All work will be done within the fenced yard of the existing Woodland 1 power plant.

NEW TRANSMISSION LINE

In addition to the switchyard facilities, accommodating the power output of the WGS2 project will require a new 1.2-mile long 69 kV transmission line to be known as Woodland-Ensen Line 2. The new line will extend from the Woodland 1 69 kV switchyard by using the spare bay to an existing breaker at the MID's Ensen substation (MID 2001a, SPPE pgs. 2-13, 2-14, 5-4, and 5-5). The route of the new line is shown in Figure 2-1 of the MID SPPE filing. For the entire route, either the existing 12 kV line(s) will be upgraded to accommodate the new 69 kV circuit (12 kV line(s) remaining as underbuild(s)), or the existing single circuit 69 kV line with 12 kV circuit(s) as underbuild(s) will be upgraded to a double circuit 69 kV line with 12 kV underbuild(s). As such, no new ROW will be involved and construction can proceed for the new 69 kV line by replacing the existing poles and stringing new conductors and insulators (MID 2001a, SPPE Figure 5-1). The new line will be constructed with 954 kilo-circular mills (KCM) all aluminum conductor (AAC), with a normal rating of 97 MVA. The configuration of conductors and poles is acceptable and in compliance with CPUC GO-95 Rules.

TRANSMISSION LINE ALTERNATIVES

Transmission line alternatives when compared to the preferred Woodland-Ensen line 2 were not chosen by the Applicant on the basis of environmental impacts, longer routes, and increased costs (MID 2001a, SPPE pgs. 9-9, 9-10). The preferred alternative is acceptable to the staff.

DOWNSTREAM IMPACTS

The project impacts on the transmission system downstream of the interconnection facilities are discussed in the System Reliability section. The impacts of the project on the MID system require a new 69 kV second transmission line (discussed above) between the Woodland 1 switchyard and the Ensen substation (MID 2001a, SPPE pgs. 2-13, 2-14), up-rating the 12th Street-Santa Rosa and 12th Street-Lapham 69 kV transmission lines by reconductoring and congestion management³ (MID 2001b, SPPE Supplemental I pgs. 7-10). The MID also has early plans for the future to build a third WAPA-MID 230 kV intertie to improve their system reliability and mitigate potential problems. This potential tie line is, however, not required for

³ Congestion management will consist of remedial action schemes and operational measures to reduce or increase local generation, shed system loads and other network switching operations.

reliable interconnection of the WGS2 project and is not part of the “whole of the action.”

The Short Circuit study indicates that equipment in adjacent substations, Standiford and 8th Street, will be overloaded (MID 2001b, SPPE Supplemental I p. 11). Although the MID has not mentioned any specific mitigation measures, staff assumes that according to good utility practices, the MID will replace the breakers of the substations to higher rating and/or replace the substation relays to withstand the increased fault current due to the addition of the WGS2 project and to protect the equipment. All work will be done within the fence lines of the existing substations and would not cause significant environmental impacts.

SYSTEM RELIABILITY

INTRODUCTION

A system reliability impact study for connecting a new power plant to the existing power system grid is performed to determine the interconnection facilities to the grid, downstream transmission system impacts, and their mitigation measures in conformance with system performance levels as required in Utility reliability criteria, NERC planning standards, and WSCC reliability criteria. The study identifies both positive and negative impacts, and also for the reliability criteria violation cases (i.e., for the negative impacts) determines the additional transmission facilities or other mitigation measures. The study is conducted with and without the new generation project and its interconnection facilities with the computer model cases for the year the project will come on-line. The study, in general, includes Load Flow study, Transient Stability study, and Short Circuit study 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. The study must be conducted under normal conditions (N-0) of the system with all system elements in service for the scenario and also for all appropriate contingency/emergency conditions, which include the loss of a single system element (N-1) such as a transmission line, a transformer, or a generator and also include the simultaneous loss of two system elements (N-2) such as two transmission lines or a transmission line and a generator. In addition to the above analysis, special studies may be performed to measure system losses and to verify whether sufficient active or reactive powers are available in the area system or area sub-system to which the new generator project will be added.

SYSTEM RELIABILITY IMPACT STUDY RESULTS

A system reliability impact study was performed by the MID (MID 2001a, SPPE pgs. 5-6, Appendices 5-1 and 5-2; and MID 2001b, SPPE Supplemental I pgs. 3-11, Figures 40-1 to 40-4, Attachments TR-39 and TR-41) and the staff with 2003 and 2005 heavy summer power flow cases.

The ***findings*** of the study were:

- (a) ***Load Flow study:*** The study was conducted with 2003 heavy summer cases without and with the new WGS2 generation project for normal conditions (N-0) of the network and under single (N-1) and double (N-2) contingencies within the

MID system and in the 230 kV and 500 kV bulk power systems of WAPA, Cal-ISO, and TID surrounding the MID system. No overloading or voltage violations were found in the MID system indicating no transmission congestion during normal conditions of the network.

Out of 41 single contingency cases performed, three single contingencies violated reliability criteria in the MID system and called for mitigation measures. With the outage of Parker 230/69 kV transformer#1, Parker 230/69 kV transformer#2 is overloaded by 10% with addition of the WGS2 project, however, the transformer load is within its emergency rating. With the outage of the Woodland-Enslen 69 kV line, the Woodland-Prescott 69 kV line loading was 164% of its normal rating with addition of the new WGS2 project and, therefore, calls for a second new 69 kV line between Woodland and Enslen to mitigate the impact of the new generation project. With the outage of Claus-Lincoln 69 kV line, the 12th Street-Santa Rosa and 12th Street-Lapham 69 kV lines are overloaded by 16% and 11% respectively and, therefore, calls for up-rating the lines by reconductoring with higher capacity conductors.

Out of 33 double contingency cases performed, three double contingencies violated reliability criteria and called for mitigation measures. With an outage of both the 115 kV tie lines to the MID system, the Woodland-Prescott 69 kV line is overloaded by 20% of its normal rating with addition of the new WGS2 project. As a mitigation measure, the MID will close the normally open Standiford-Sylvan 69 kV line and use congestion management. The MID system will, however, see improvement in voltage deviations due to operation of the WGS2 project. With an outage of Woodland-Enslen 69 kV lines 1 and 2, the Woodland-Prescott 69 kV line is loaded to 164% of its normal rating and as a mitigation measure the MID will use congestion management by reducing generation of Woodland 1 or WGS2.

With an outage of both 230 kV ties to the MID system (i.e., Westley-Parker and Walnut-Parker 230 kV lines), the MID system without the new WGS2 project will encounter severe low voltage or voltage collapse, overloading of lines, and eventual loss of load. However, during the outage of both the 230 kV tie lines, the system conditions will improve considerably with the addition of the WGS2 project. The voltage deviation with WGS2 will improve and the overloading will be restricted to the 115 kV tie lines, several 115/69 kV transformers, and 69 kV transmission lines. Mitigation measures will include reducing load and/or increasing local generation, and switching on capacitors and other network operating measures.

Staff's analysis shows that the outage of both the 230 kV tie lines to the MID is the most severe double contingency for the MID system. During this critical contingency without the new WGS2 project, with 200 MW of local generation the MID's import will have to be limited to about 340 MW so as to serve a total load of 540 MW instead of a projected 700 MW load without violating reliability criteria. But with addition of the new WGS2 project and during the same critical outage of both the 230 kV tie lines, the MID system with 280 MW of local generation will be able to serve a total load of 640 MW instead of 700 MW without any criteria violations. The

WGS2 project, therefore, results in about 100 MW less load shedding during the critical contingency. However, some loss of load may remain unavoidable to maintain reliability of the system during the contingency. To mitigate all the potential problems comprehensively due to the critical double contingency, the MID may plan in the future to build a third WAPA-MID 230 kV intertie to improve their system reliability and import capability (MID 2001b, SPPE Supplemental I p. 10). This proposed 230 kV tie line is not, however, required for reliable interconnection of the WGS2 project.

- (b) **Transient Stability study:** The MID (MID 2001b, SPPE pgs. 9-10, Figures 40-1 to 40-4) and staff have conducted a transient stability study with and without the new WGS2 project. The study was conducted with a 6 cycle three-phase fault at Parker 230 kV bus and subsequent double contingency conditions of both Parker 230 kV tie lines. The MID system was found unstable without the new WGS2 facility and found stable with the new WGS2 generator on-line.
- (c) **Short Circuit study:** The Short Circuit study indicates that equipment short circuit ratings in adjacent substations, Standiford and 8th Street, will be exceeded (MID 2001b, SPPE Supplemental I p. 11) due to increased fault currents. Although the MID has not mentioned any specific mitigation measures, staff assumes that according to good utility practices, the MID will replace the breakers of the substations with a higher rating and/or replace the substation relays to withstand the increased fault current due to addition of the WGS2 project to protect the equipment.

CUMULATIVE IMPACTS

Since the WGS2 project will be located in the load center of the MID system and all the proposed facilities will be located within the existing fence lines, the project will minimize potential cumulative impacts.

CONCLUSIONS

1. Staff's analysis and findings indicate that there are no significant unmitigated adverse reliability impacts due to the WGS2 project.
2. The MID system is short of local generation and reactive power, and its import capability is also limited. The addition of the WGS2 project will significantly improve the reliability performance of the MID system to meet NERC planning standards and WSCC reliability criteria. More reactive power will be available and voltage deviations will improve. About 100 MW of load dropping will be averted with the addition of the new generation project during the critical double contingency of the Parker 230 kV tie lines.
3. The interconnection of the new project will not negatively affect the reliability of the bulk power transmission grid of WAPA, Cal-ISO, and TID surrounding the MID system.
4. All the proposed switchyard and downstream facilities are acceptable and will comply with LORS assuming the facilities as proposed in the filings are implemented.

PROPOSED CONDITIONS OF EXEMPTION

TSE-1 The Applicant shall provide the following Notice to the California Independent System Operator (Cal-ISO) prior to synchronizing the facility with the California Transmission system:

1. At least one (1) week prior to synchronizing the facility with the grid for testing, provide the Cal-ISO a letter stating the proposed date of synchronization. This letter should also affirm that all the electrical facilities necessary to connect the new facility to the grid have been installed and successfully tested; and
2. At least one (1) business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the ISO Outage Coordination Department, Monday through Friday, between the hours of 7:00 a.m. and 3:30 p.m. at (916) 351-2300.

Verification: The applicant shall provide copies of the Cal-ISO letter to the CPM when it is sent to the Cal-ISO one (1) week prior to initial synchronization with the grid. A report of conversation with the Cal-ISO shall be provided electronically to the CPM one (1) day before synchronizing the facility with the California transmission system for the first time.

REFERENCES

Cal-ISO (California Independent System Operator). 1998. Cal-ISO Dispatch Protocol posted April 1998.

MID (Modesto Irrigation District). 2001a. Application for Small Power Plant Exemption, Woodland Generating Station 2 Project (01-SPPE-1). Submitted to the California Energy Commission, May 4, 2001.

_____. 2001b. Gas Supply Line Modifications Modesto Irrigation District Project (01-SPPE-1). Submitted to the California Energy Commission, May 25, 2001.

NERC (North American Electric Reliability Council). 1998. NERC Planning Standards, September 1997.

WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.

CPUC General Order 95 (GO-95), Rules for Overhead Electric line Construction.

VISUAL RESOURCES

Testimony of Michael Clayton

INTRODUCTION

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether Woodland Generation Station 2 (WGS2) would cause visual impacts and whether the project would be in compliance with applicable laws, ordinances, regulations, and standards. The determination of the potential for visual impacts resulting from the proposed project is required by the California Environmental Quality Act (CEQA)

This analysis includes the following:

- Description of applicable laws, ordinances, regulations and standards;
- Assessment of the visual resources setting of the proposed power plant site and linear facility routes;
- Evaluation of the visual impacts of the proposed project on the existing setting;
- Evaluation of compliance of the project with applicable laws, ordinances, regulations, and standards;
- Conclusions;
- Proposed Conditions of Exemption; and
- References

A summary of the visual resources analytical data is presented in table form in Appendix A-1. A discussion of the visual resources analysis methodology is provided in Appendix A-2. A lighting complaint resolution form is also provided in Appendix A-3. Appendix A-4 presents the visual resources figures.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following discussion of Federal, State, and Local laws, ordinances, regulations, and standards is based on Section 8.11.2 (LORS) of the Applicant's Application (MID 2001a, SPPE pages 8.11-1 through 4).

FEDERAL

The proposed project is not located on federally administered public lands and is not subject to federal regulations pertaining to visual resources.

STATE

None of the roadways in the project vicinity including State Route (SR) 99 are eligible or designated State Scenic Highways (MID 2001a, p. 8.11-1; and State Scenic Highway System Web Site). Therefore, no state regulations pertaining to scenic resources are applicable to the project.

LOCAL

The proposed power plant, water supply pipeline, and transmission line are located within the City of Modesto and Stanislaus County while the gas pipeline upgrades are located within the City of Ripon and San Joaquin County. Therefore, the project would be subject to local laws, ordinances, regulations, and standards (LORS) pertaining to the protection and maintenance of visual resources. However, LORS applicable to the proposed project are found only in the San Joaquin County General Plan. Stanislaus County and the Cities of Modesto and Ripon have no visual resource policies pertinent to the proposed project.

Five sections of the San Joaquin County General Plan contain a total of six visual resource related policies that are applicable to the proposed project. A list of the six relevant policies and an assessment of the project's consistency with those policies is presented in a later section of this analysis.

SETTING

EXISTING LANDSCAPE

The proposed project would be located in the eastern San Joaquin Valley, a landscape characterized by nearly level, open terrain. The proposed power plant, water supply pipeline, and transmission line would be located within the western portion of the City of Modesto. The proposed gas supply pipeline upgrades would be located within and west of the City of Ripon. Several photographs were taken to illustrate the visual character of the landscape in the vicinity of the various project components. **VISUAL RESOURCES Figure 1** shows the locations from which the visual character photographs were taken.

The proposed power plant would be located in an industrialized area immediately adjacent to and to the west of the existing Modesto Irrigation District (MID) Woodland 1 power plant, which is just east of SR 99 (see **VISUAL RESOURCES Figures 1, 2, 3, and 5**). The site is industrial in appearance, exhibiting complex forms and lines and geometric shapes. The site is dominated by the existing power plant facilities and is situated between Graphics Drive on the west, Woodland Avenue on the North, and the Union Pacific Railroad tracks and North 9th Street on the east. To the south are vacant buildings and undeveloped land. The immediate project vicinity includes industrial and commercial facilities to the west, north, and east of the site. The Foster Farms plant is to the south of the site, beyond and to the east of the undeveloped parcel. The visual quality of the proposed site and vicinity is low.

The proposed water supply line would be located underground parallel to Kansas Avenue and Graphics Drive south of the power plant site as shown in Figure 1. The pipeline route would pass through a predominantly industrial setting. Visual quality along the water supply line route is also low.

The proposed transmission line would be placed on existing poles as it exits the power plant site and travels east on Woodland Avenue and south along the west side of North 9th Street. At Tully Road, the line would turn north on the west side of the street before turning east on Stoddard Avenue to Terminal Avenue and Enslin Substation (see **VISUAL RESOURCES Figures 1 and 4**). The proposed line would require new replacement poles approximately 10 to 15 feet taller than the existing poles along Tully Road, Stoddard Avenue, and Terminal Avenue. The landscape along Woodland Avenue, North 9th Street, and Tully Road is industrial in character and visual quality is low. However, along Stoddard and Terminal Avenues, the route passes through a predominantly suburban residential landscape with a low-to-moderate visual quality.

The proposed gas pipeline reinforcements would be located in residential and rural agricultural areas within and to the west of the City of Ripon. Beginning at the intersection of West Ripon Road and South Austin Road, the 3.25-mile reinforcement to the Ripon-Modesto Distribution Feeder Main will be located within or adjacent to West Ripon Road, Jack Tone Road, and Doak Road to Vera Road (see **VISUAL RESOURCES Figures 6 and 7**). This route originates in a rural residential and agricultural area along West Ripon Road and then passes through residential areas along Jack Tone Road and Doak Road. The Reinforcement to Line 108 will pass primarily through open agricultural fields and near a few rural residences from West Ripon Road, south to its intersection with South Airport Way (see **VISUAL RESOURCES Figures 8 and 9**). Visual quality along the gas pipeline routes ranges from low-to-moderate to moderate.

VIEWER EXPOSURE

Most views of the power plant site are limited to adjacent roadways and businesses and the upper floors of the taller buildings in the downtown area. The power plant would be visible from State Route 99 and Graphics Drive to the west, Woodland Avenue to the north, North 9th Street to the east, and the upper floors of the Doubletree Hotel/Centre Plaza Office Building and Tenth Street Place Office Building to the south in downtown Modesto. Viewers would be motorists and pedestrians on the referenced roads, and occupants of downtown buildings. Foreground to background views are partially screened to unobstructed, and except for the more distant background views from downtown buildings, foreground viewing opportunities would be typical. Residents to the west and northeast of the project site would have views of the plumes but not the project power plant structures. Due to the long-term nature of visual exposure that would be experienced from residences, and the sensitivity with which people regard their places of residence, residential viewers are considered to have high viewer concern. Commuters would be numerous during the sunrise to 10:00 AM and 4:00 to 7:00 PM periods and would have views ranging from brief and indirect for the power plant facilities to extended and direct for the project plumes. However, viewer exposure would be

greater during the morning commute when many motorists are driving toward downtown Modesto (and the project site) rather than away as in the evening commute. Viewer concern is rated moderate for commuters. Workers and occupants of industrial, commercial, and office buildings are attributed low viewer concern since the focus of their attention is interior to their location.

The reasonable worst case plume from the Heat Recovery Steam Generator (HRSG) and the cooling tower would rise to approximate heights of 127 meters and 80 meters or greater respectively. The viewshed of the plumes would encompass the immediate project vicinity and extend to the following roadways and viewing areas (with the distance range from the project site shown in parentheses):

- Southbound SR 99 from Pelandale Avenue (0-4.5 miles)
- Northbound SR 99 from Whitmore Avenue to approximately Hatch Road (4-5.25 miles) and from Kansas Avenue to the project vicinity (0-0.4 mile)
- Southbound North 9th Street from Carpenter Road/W. Briggsmore Avenue (0-1 mile)
- Northbound 9th Street from approximately O Street (0-0.9 mile)
- Southbound Sisk Road from Pelandale Avenue (1.35-4.5 miles)
- Southbound Brink Avenue from North Avenue (1-2 miles)
- Southbound Carpenter Avenue from SR 99 (0.45-1.2 miles)
- Northbound Carpenter Avenue from SR 132 (0.45-1.2 miles)
- Eastbound Woodland Avenue from Carpenter Avenue (0-0.7 mile)
- Westbound Woodland Avenue from North 9th Street (adjacent)
- Eastbound Shoemake Avenue from Dakota Avenue (0.9-2.7 miles)
- Eastbound SR 132 (Maze Boulevard) from Pauline Avenue (0.9-2 miles)
- Northbound Graphics Drive (0-0.45 mile)
- Residences west of Carpenter Avenue, north of Kansas Avenue, and south of Blue Gum Avenue (0.7-1.35 miles)
- Residences east of North 9th Street, west of Tully Road, and south of Orangeburg Avenue (0.35-0.9 mile)
- J.M. Pike Park (0.28 mile)
- Modesto Junior College East (0.45 mile)
- Modesto Junior College West (0.9 mile)
- Upper floors of downtown office buildings including Center Plaza Office Building and Doubletree Hotel and Tenth Street Place (1.25-1.3 miles)

The underground water supply pipeline would not be visible during project operation. However, pipeline construction activities, materials, and personnel would be visible to pedestrians and motorists on Kansas Avenue and Graphics Drive, as well as to some workers in adjacent commercial and industrial uses.

The proposed transmission line would be visible from the roads that it follows and the residential, commercial, and industrial uses that are located along those roads, which include Woodland Avenue, North 9th Street, Tully Road, Stoddard Avenue, and Terminal Avenue. Viewers would be motorists and pedestrians on the roads that the transmission line follows, students in the vicinity of Modesto Junior College,

and residents along Stoddard and Terminal Avenues. Foreground views would be partially screened to unobstructed.

Except for the occasional aboveground warning marker, the underground gas pipelines would not be visible during project operation. However, pipeline construction activities, materials, and personnel would be visible in the vicinity of the pipeline routes which include South Austin Road (a County-designated scenic route), West Ripon Road, Jack Tone Road, Doak Road, and Vera Road for the Ripon-Modesto Distribution Feeder Main; and West Ripon Road, East Perrin Road, East Trahern Road, and South Airport Road for Line 108. Viewers would include adjacent residents in Ripon and along the 108 Line, field workers along the 108 line, and pedestrians and motorists on the referenced roads.

KEY OBSERVATION POINTS

Four key observation points (KOPs) were established to characterize the existing visual setting within which the proposed project would be evaluated. **VISUAL RESOURCES Figure 1** shows the location of the four KOPs. At each KOP, a visual analysis was conducted; the results of which are presented in Appendix A. The following paragraphs briefly summarize the concluding assessments of overall visual sensitivity at each KOP. Overall visual sensitivity takes into account existing landscape visual quality, viewer concern, and overall viewer exposure.

KOP 1 was established on Graphics Drive, south of the power plant site and immediately adjacent to SR 99 to approximate the existing view of the site from northbound SR 99 (**VISUAL RESOURCES Figure 10A**). The overall visual sensitivity of the landscape viewed from SR 99 (and Graphics Drive) is low-to-moderate in spite of moderate viewer concern and moderate-to-high viewer exposure to travelers on SR 99. This conclusion is largely the result of the low visual quality of the site and vicinity industrial landscape.

KOP 2 was established on Woodland Avenue, west of the power plant site at the SR 99 overcrossing (**VISUAL RESOURCES Figure 11A**) to show the view of the power plant site available to eastbound motorists on Woodland Avenue. Although viewer exposure to the prominent foreground structures would be moderate-to-high, the overall visual sensitivity of the landscape viewed from Woodland Avenue is again low-to-moderate because of the low visual quality of the industrial landscape.

KOP 3 was established on North 9th Street at the Travelers Motel (**VISUAL RESOURCES Figure 12A**). The overall visual sensitivity of the landscape viewed from North 9th Street is low-to-moderate in spite of the moderate-to-high viewer exposure to viewers along North 9th Street because of the low visual quality of the industrial landscape in the vicinity of the project site and the moderate viewer concern attributed to viewers along North 9th Street.

KOP 4 was established on Stoddard Avenue at the College Avenue intersection (**VISUAL RESOURCES Figure 13A**), looking east along the proposed transmission line upgrade route (the proposed project would replace the existing structures along the right [south] side of the street). Overall visual sensitivity is moderate due to the

low-to-moderate visual quality of the suburban residential landscape and the moderate-to-high viewer concern and overall viewer exposure associated with Stoddard Avenue residents, motorists, and pedestrians along the route.

IMPACTS

ENVIRONMENTAL CHECKLIST

VISUAL RESOURCES	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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, and historic buildings within a state scenic highway?				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		

DISCUSSION OF IMPACTS

A summary of the impact analysis is presented in a table in Appendix A-1. The impact assessment methodology and significance criteria utilized in this study are described in detail in Appendix A-2. The following discussion explains the responses to the questions in the environmental checklist.

A. SCENIC VISTAS

No scenic vistas of high visual quality were identified within the viewshed (area of potential visual effect) during field study of the proposed WGS2 project, nor are any such vistas identified in adopted public policy documents. The project would thus not have a substantial adverse effect on a scenic vista.

B. SCENIC RESOURCES

As indicated in the previous discussion of LORS, there are no state designated scenic highways within the proposed project viewshed. Although Austin Road is a County-designated scenic route, it is not state-designated. Also, the proposed project would be located underground in the vicinity of Austin Road and would not be visible. The project would thus not have a substantial adverse effect on scenic resources.

C. VISUAL CHARACTER OR QUALITY

Project aspects that were evaluated in the assessment of Item C included project construction; power plant structures; electric transmission line, water and gas supply pipelines; and HRSG and Cooling Tower plumes.

PROJECT CONSTRUCTION

Construction of the proposed power plant would cause temporary visual impacts due to the presence of equipment, materials, and workforce. Construction would involve the use of cranes, heavy construction equipment, temporary storage and office facilities, and temporary laydown/staging areas. The proposed project construction would occur over a 17-month period. Due to the short-term nature of project construction and the low-to-moderate to moderate overall visual sensitivity of the project locations, no substantial visual degradation of the sites or their surroundings would occur as long as staging and material and equipment storage areas are screened from view from adjacent or nearby residences and local roads. Proper implementation of Condition of Exemption VIS-1 would ensure that potential visual impacts associated with project construction remain less than significant.

POWER PLANT AND LINEAR FACILITIES

The power plant and linear facilities would not cause significant long-term visual impacts. **VISUAL RESOURCES Figures 10B, 11B, and 12B** (Appendix A-5) present visual simulations of the proposed power plant viewed from KOPs 1, 2, and 3 respectively. As shown in these simulations and summarized in Appendix A-1, the overall visual change that would be experienced at these KOPs would be low-to-moderate, reflecting (a) the low-to-moderate visual contrast that would be apparent relative to the existing industrial landscape, (b) the co-dominant presence of the proposed facilities, and (c) the low degree of view blockage that would occur. Within an existing landscape context with low-to-moderate overall visual sensitivity, the resulting visual impacts would be adverse but not significant (see Appendix A-1, KOPs 1-3).

The upgraded transmission line would not cause significant long-term visual impacts (see Appendix A-1, KOP 4). **VISUAL RESOURCES Figure 13B** (Appendix A-5) presents a visual simulation of the transmission line upgrade as viewed from KOP 4. As shown in the simulation, the overall visual change that would be experienced at KOP 4 would be low. When assessed within a predominantly residential landscape context of moderate overall visual sensitivity, the resulting low degree of visual change would cause adverse but not significant visual impacts.

Also, because there would be no apparent evidence of the underground water and gas supply pipelines (except for an occasional aboveground warning marker for the gas pipelines), no significant visual impacts would occur during pipeline operation.

HRSG AND COOLING TOWER PLUMES

The proposed project would include the addition of a new combined-cycle gas turbine/HRSG train with stack and a three-cell cooling tower. Staff conducted an independent plume modeling analysis of the project and concluded that visible

plumes from the HRSG exhaust stack and cooling tower would occur during periods of cold weather or cool wet weather. The actual frequency of occurrence is weather and turbine operation dependent and will vary from year to year. Additionally, plume formation can occur during the daytime or nighttime. However, the meteorological data reviewed indicates that conditions for plume formation are most prevalent during nighttime and early morning hours. Of primary concern is the high frequency of plume formation during the early morning (sunrise to 10:00 AM) commute hours when large numbers of motorists would be driving on local roads and along entryways to the downtown area from the north, west, and south. A substantial increase in plume exposure (the total amount of vapor plume visible over a given number of hours) can impart the visual impression of increased industrialization of a given landscape, which is considered a negative project visual resources outcome. Staff's plume analysis is presented in Appendix A-4 and summarized here.

As shown in Table 1 below, a high frequency of plume formation would occur as a result of the proposed project. The new HRSG plume would occur 27% of all seasonal daylight hours (seasonal daylight hours are those daylight hours during the months [November to April] when conditions conducive to plume formation are most prevalent). However, during the seasonal sunrise to 10:00 AM daylight hours under no fog/no rain conditions, HRSG plume formation would occur 56% of the time compared to only 24% of the time for the existing Woodland 1 HRSG plume. The new cooling tower plume would occur 35% of all seasonal daylight hours but 66% of the seasonal sunrise to 10:00 AM daylight hours under no fog/no rain conditions.

Table 1
Staff Predicted Hours with HRSG and Cooling Tower Steam Plumes
Fresno 1990 to 1994 Meteorological Data

Projection Period	WGS2 OTSG HRSG w/Duct Firing and Water Injection		Woodland 1 HRSG Stack Full Load w/Power Augmentation		WGS2 Cooling Tower	
	TOTAL	PERCENT*	TOTAL	PERCENT*	TOTAL	PERCENT*
All Hours	14,639	33.41%	8,987	20.51%	16,574	37.82%
Seasonal Daylight**	2,231	27.25%	747	9.12%	2,898	35.39%
Seasonal Sunrise to 10 am**	1,229	56.58%	524	24.13%	1,433	65.98%

* The percentages shown in this table represent the percentage of the quantity listed (i.e. all hours = 43,818 hours, seasonal November-April daylight hours = 8,188 hours, seasonal sunrise to 10 am hours = 2,172 hours).
** Daylight hours are under no fog/no rain conditions.

Table 2 provides the HRSG and cooling tower plume dimensions for the 10% frequency plume during the seasonal sunrise to 10:00 AM period under conditions of no fog and no rain. As is apparent in Table 2, the 10% frequency plume from the proposed HRSG would be larger than the existing HRSG plume, reaching at least 127 meters (416 feet) in height above the ground and extending horizontally at least 93 meters (305 feet). The plume widths would be similar. The proposed cooling tower plume would reach a height of at least 80 meters (262 feet) above the ground with a horizontal length of at least 91 meters (298 feet). As a comparison, the existing radio transmitting tower located across SR 99 from the project site is 400

feet tall. The 10% frequency HRSG plume would reach a height greater than the transmitting tower while the cooling tower plume would reach approximately two-thirds the height of the transmitting tower.

Table 2 - Staff Predicted Plume Dimensions for the 10% Frequency Plume During Seasonal Daylight Sunrise to 10:00 AM Hours Under No Fog/No Rain Conditions 1990 to 1994 Fresno Meteorological Data (all units in meters)

Plume Parameter	Proposed HRSG Plume	Existing HRSG Plume	Proposed Cooling Tower Plume
Plume Height	127	98	80
Plume Length	93	68	91
Plume Width	20	21	34

As shown in Tables 1 and 2, the proposed project with its two additional plumes would cause a substantial increase in plume exposure. **VISUAL RESOURCES Figure 14**, which is to show a simulation of the plumes viewed from KOP 1, has yet to be provided by the Applicant. The plumes would be visible up to approximately 4.5 miles from the plant site compared to the slightly less than 1/2-mile visibility radius for the power plant structures. The additional WGS2 plumes would substantially increase the presence of plumes in the existing landscape established by the Woodland 1 plume and the Foster Farms plume one-half mile to the south.

Motorists would experience the project plumes as visually noticeable to dominant landscape features for extended periods as they travel toward the downtown area of Modesto, primarily from the north and west. As described in the Setting discussion above, these viewers would be expected to have moderate visual concern. The regional prominence of the additional plumes would result in an adverse visual impact as a result of: (a) the high frequency of plume occurrence (56% and 66% of the seasonal sunrise to 10:00 AM hours under no fog/no rain conditions for the HRSG plume and cooling tower plume respectively), (b) the high visibility and prominence of the plumes in the viewsheds of the major travel corridors and local roads leading to downtown Modesto, and (c) the moderate to high viewer concern of commuters and residents respectively. However, these impacts would be less than significant with effective HRSG vapor plume abatement such that the WGS2 HRSG visible vapor plume is no more frequent or larger than the visible vapor plume from the Woodland 1 HRSG exhaust during morning hours from sunrise to 10:00 AM daily from November 1st through April 30th. Proper implementation of Condition of Exemption VIS-2 would ensure that potential visual impacts associated with project vapor plumes remain less than significant.

D. LIGHT OR GLARE

Existing visible night lighting from commercial and industrial facilities in the project region is substantial, ranging from softer amber colored light to intense white light. However, in the immediate project site vicinity, the existing power plant is the most prominent source of night light and glare. As shown in **VISUAL RESOURCES Figure 15**, night lighting from the existing power plant is highly visible to motorists on northbound 99 once they emerge from the subgrade section of 99 just north of

the Kansas Avenue overpass. Many of the lights are unshielded or occur in clusters, creating a more prominent visual source of light.

The proposed project would require nighttime lighting for operational safety and security. The additional project lighting would be consistent in appearance and intensity with that of existing power plant lighting but would substantially increase the amount of lighting at the power plant site. Also, the new facilities and lighting would be slightly closer to SR 99 and more prominent to northbound motorists than the existing plant and its night lighting.

The substantial new plant lighting, if not adequately mitigated, has the potential to have adverse effects on the nighttime visual environment of the immediate project vicinity, due to the glare that would be visible to northbound motorists on SR 99. However, proper implementation of Condition of Exemption VIS-3 would minimize visible nighttime lighting and keep glare impacts to less than significant levels.

CUMULATIVE IMPACTS

Cumulative impacts to visual resources could occur where project facilities or activities (such as construction) occupy the same field of view as other built facilities or impacted landscapes. It is also possible that a cumulative impact could occur if a viewer's perception is that the general visual quality of an area is diminished by the proliferation of visible structures (or construction effects such as disturbed vegetation), even if the new structures are not within the same field of view as the existing structures. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) visual access to scenic resources is impaired; (3) visual quality is diminished; or (4) the project's visual contrast is increased.

Three cumulative projects have been identified for evaluation: (a) the Modesto Junior College Commercial Project proposed to be located east of the proposed project site, (b) the Northwest Business Park Project proposed to occur approximately one mile north of the proposed project site, and (c) the FMC Alkali Division property immediately south of the proposed project site.

The proposed project would not be visible in the same viewshed as the College Commercial Project and the Northwest Business Park Project and no cumulative visual impacts would occur. The proposed project would be visible within the same viewshed as the FMC Project when viewed from northbound SR 99 and Graphics Drive. However, the site vicinity is industrial in character and development of the FMC site as an infill industrial/business park would actually screen a portion of the proposed project from northbound SR 99 views. The resulting adverse cumulative impact would not be significant.

The proposed project's addition of two plumes with high visibility and frequency of occurrence to a landscape containing two existing plumes would cause an adverse cumulative visual impact. However, the impact would be less than significant with implementation of the proposed plume abatement measure as described under Condition of Exemption VIS-2.

Also, with the addition of the proposed facility's lighting, the combined lighting effect of both WGS2 and Woodland 1 would provide a greater distraction to nighttime motorists on SR 99. However, the impact would be less than significant with implementation of the night lighting control measures to minimize the potential for glare from both the proposed WGS2 plant and the existing Woodland 1 plant, as described under Condition of Exemption VIS-3.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LOCAL

Table 3 provides a preliminary listing of the applicable LORS of San Joaquin County (where the natural gas pipelines would be located) regarding visual resources. Six relevant policies in five General Plan sections pertain to the enhancement and/or maintenance of visual quality. The proposed project is consistent with all six of the policies referenced in Table 3. The proposed project is therefore consistent with Local LORS.

Table 3 - Proposed Project's Consistency with Local LORS Applicable to Visual Resources: San Joaquin County General Plan

LORS		Consistency Determination Before Mitigation	Basis for Consistency
General Plan Section	Objective and Policy Descriptions		
Community Organization and Development Pattern	Objective: <i>To create a visually attractive county.</i>	YES	<p><i>Policy 11:</i> While the proposed project would not specifically complement the industrial character of the site or vicinity, it would generally appear consistent with other on-site and nearby industrial facilities.</p> <p><i>Policy 12:</i> The proposed project's potential impact on local and regional visual resources was considered in both the project proponent's Application presented to the Commission and in staff's evaluation of the proposed project.</p>
	<ul style="list-style-type: none"> Policy 11: Development should complement and blend in with its setting. Policy 12: Aesthetics should be considered when reviewing development proposals. 	YES	
Public Facilities	Objective: <i>To protect diverse resources upon which recreation is based, such as waterways, marshlands, wildlife habitats, unique land and scenic features, and historical cultural sites.</i>	YES	<p>Although the proposed project's reinforcement of the Ripon-Modesto Distribution Feeder Main (natural gas) would intersect the County-designated Scenic Austin Road at West Ripon Road, visual impacts on views from Austin Road would be short-term, during construction only. Once the pipeline has been installed underground, there would be no noticeable presence of the</p>
	<ul style="list-style-type: none"> Policy 23: Scenic corridors along recreation travelways and scenic routes shall be protected from unsightly 		

Table 3 - Proposed Project's Consistency with Local LORS Applicable to Visual Resources: San Joaquin County General Plan

LORS		Consistency Determination Before Mitigation	Basis for Consistency
General Plan Section	Objective and Policy Descriptions		
	development.		underground facility.
Open Space	<p>Objective: <i>To preserve open space land for the continuation of commercial agricultural and productive uses, the enjoyment of scenic beauty and recreation, the protection and use of natural resources, and for protection from natural hazards.</i></p> <ul style="list-style-type: none"> • Policy 11: Outstanding scenic vistas shall be preserved and public access provided to them whenever possible. • Policy 13: Development proposals along scenic routes shall not detract from the visual and recreational experience. 	YES	<i>Policy 11:</i> Due to the underground nature of the proposed gas supply pipelines, there would be no adverse impact on any outstanding scenic vista.
		YES	<i>Policy 13:</i> The short-term visual impact during construction of the underground pipeline in the vicinity of County-designated scenic Austin Road would not significantly detract from the visual experience along Austin Road. Longer-term, the buried pipeline would not have substantial aboveground presence and would not detract from the visual experience along Austin Road.
Air Quality	<p>Objective: <i>To protect public health, agricultural crops, scenic resources, and the built and natural environments from air pollution.</i></p> <ul style="list-style-type: none"> • Policy 1: San Joaquin County shall meet and maintain all State and national standards for air quality. 	YES	The underground presence of the pipeline would not adversely affect existing State and national air quality standards and thus, would not adversely affect county scenic resources.
Water Resources and Quality	<p>Objective: <i>To recognize the surface waters of San Joaquin County as resources of State and national significance for which environmental and scenic values must be protected.</i></p> <ul style="list-style-type: none"> • No specific policy statements 	YES	The underground pipeline would not have an aboveground presence. Therefore, the proposed project would not impact the scenic values of any surface waters.

CONCLUSIONS

With effective implementation of the staff proposed conditions of exemption, the proposed project would cause less than significant visual impacts. The project as proposed is in compliance with applicable laws, ordinances, regulations, and standards regarding visual resources.

PROPOSED CONDITIONS OF EXEMPTION

VIS-1 Pipeline Construction. The project owner shall ensure that visual impacts of pipeline construction are adequately mitigated. To accomplish this, the project owner shall require the following as a condition of contract with its contractors to construct the proposed gas pipeline:

Staging and material and equipment storage areas, if visible to adjacent or nearby residences and local roads shall be visually screened. All evidence of construction activities, including ground disturbance due to staging and storage areas located in the visual foreground of adjacent or nearby residences and local roads shall be removed and remediated upon completion of construction. Any landscaping or vegetation removed in the course of construction will be replaced on a 1-to-1 in-kind basis. Such replacement planting will be monitored for a period of three years to ensure survival. During this period, all dead plant material shall be replaced.

The project owner shall submit a plan for restoring the surface conditions of any rights of way disturbed during construction of underground utilities. The plan shall include grading to the original grade and contouring and revegetation of the rights of way.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

The project owner shall not implement the plan until receiving written approval of the submittal from the CPM.

The project owner shall notify the CPM within one week after the grading and revegetation has been installed and is ready for inspection.

Verification: At least 90 (ninety) days prior to beginning implementation of the surface restoration, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days after completing the surface restoration that it is ready for inspection.

VIS-2 HRSG Vapor Plume Abatement. The project owner shall design and operate the project such that the WGS2 HRSG visible vapor plume is no more frequent and no larger than the visible vapor plume of the Woodland 1 HRSG exhaust as determined through CSVP modeling (results presented in **Visual Resources Table 2**), which assumed the maximum operating conditions as provided by the Applicant. As defined below, this condition applies only when all of the following times, dates, and conditions apply: (a) during morning hours from sunrise to 10:00 AM daily, (b) from November 1st through April 30th, and (c) when ambient temperatures are below 60° F.

If the project owner desires to institute a plume reduction method for the WGS2 HRSG and cooling tower different from that specified below and that results in an equivalent amount of plume reduction, the project owner shall submit their alternative plume mitigation plan to the CPM for review and approval prior to ordering equipment.

The project owner shall accomplish HRSG and cooling tower plume reductions by the following or equivalent methods:

- During morning hours from sunrise to 10:00 AM daily from November 1st through April 30th, when ambient temperatures are below 60° F, the project owner shall reduce the WGS2 HRSG duct firing or increase exhaust temperatures such that the WGS2 HRSG visible vapor plume is no more frequent or larger than the visible vapor plume from the Woodland 1 HRSG exhaust. When the Woodland 1 generating unit is not operating, the WGS2 HRSG duct firing shall be reduced in the same manner as would be required if the Woodland 1 generating unit were operating at full load.
- During morning hours from sunrise to 10:00 AM daily from November 1st through April 30th, when ambient temperatures are below 60° F, the project owner shall operate all three cooling tower cells with fans at full power.
- The project owner shall not circumvent this condition by modifying the operation of the Woodland 1 generating unit to produce larger or more frequent plumes than presently occur.

Verification: During the operating life of the WGS2 facility, the project owner shall record the exhaust temperature, moisture content, and operating temperature of both the WGS2 and Woodland 1 HRSG exhausts from sunrise to 10:00 AM daily from November 1st through April 30th. By May 30 of each year, the project owner shall provide to the CPM, a copy of the collected exhaust data and the CSVP modeling results that demonstrate that the plume frequency and dimensions for the WGS2 HRSG are no greater than the Woodland 1 plume.

VIS-3 Night Lighting. Prior to first turbine roll, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized during both project construction and operation.

The project owner shall develop and submit a lighting plan for the project to the CPM for review and approval. The lighting plan shall require that:

- Lighting shall be designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;
- High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance shall be provided with switches or motion detectors to light the area only when occupied;
- A lighting complaint resolution form (following the general format of that in Attachment 1) shall be used by plant operations, to record all lighting complaints received and to document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.

Verification: At least 90 (ninety) days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

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

REFERENCES

- MID (Modesto Irrigation District). 2001a. Application for Small Power Plant Exemption, Woodland Generating Station 2 Project (01-SPPE-1). Submitted to the California Energy Commission, May 4, 2001.
- MID (Modesto Irrigation District). 2001b. Gas Supply Line Modifications Modesto Irrigation District Project (01-SPPE-1). Submitted to the California Energy Commission, May 25, 2001.
- Smardon, Richard C., James E. Palmer, and John P. Felleman. 1986. *Foundations for Visual Project Analysis*. John Wiley & Sons. New York.
- U.S. Department of Agriculture, Forest Service. 1995. *Landscape Aesthetics, A Handbook for Scenery Management*. Agriculture Handbook Number 701. USDA, Forest Service.
- U.S. Department of Interior (USDI), Bureau of Land Management (BLM). 1986a. *Visual Resource Inventory Manual*. USDI, BLM.
- USDI, BLM. 1986b. *Visual Contrast Rating Manual*. USDI, BLM.
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APPENDIX A – 1: SUMMARY OF ANALYSIS

APPENDIX A – 2: ANALYSIS METHODOLOGY

Visual resources analysis has an inherent subjective aspect. However, the use of generally accepted criteria for determining impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

SIGNIFICANCE CRITERIA

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

STATE

The CEQA Guidelines defines a “significant effect” on the environment to mean a “substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including...objects of historic or visual significance (Cal. Code Regs., tit.14, § 15382).

Appendix G of the Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant:

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

LOCAL

Energy Commission staff considers any local goals, policies, or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts. See the section on Applicable Laws, Ordinances, Regulations, and Standards.

PROFESSIONAL STANDARDS

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see Smardon 1986). The questions listed below address issues commonly raised in visual analyses for energy facilities. Staff considers these questions in assessing whether a project would cause a significant impact in regard to any of the four CEQA criteria listed above.

- Will the project substantially alter the existing viewshed, including any changes in natural terrain?
- Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?
- Will the project eliminate or block views of valuable visual resources?
- Will the project result in significant amounts of backscatter light into the nighttime sky?
- Will the project be in conflict with directly identified public preferences regarding visual resources?
- Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?
- Will the project result in a substantial and persistent visible exhaust plume?

VIEW AREAS AND KEY OBSERVATION POINTS

The proposed project is visible from a number of areas in the project region. Energy Commission staff evaluated the visual impact of the project from each of these areas. Staff used Key Observation Points¹, or KOPs, as representative locations from which to conduct detailed analyses of the proposed project and to obtain existing conditions photographs and prepare visual simulations. KOPs are selected to be representative of the most critical locations from which the project would be seen. However, KOPs are not the only locations that staff considered in each view area.

EVALUATION PROCESS AND TERMINOLOGY

For each view area, staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. Staff conducted a site visit and concluded that two of the KOPs presented in the Application were appropriate for this analysis. However, staff also requested that KOPs 1 and 2 be revised to provide less obstructed views of the site from Graphics Road/SR 99 and Woodland Avenue. The results of staff's analysis are summarized in VISUAL RESOURCES Appendix A-1. Existing conditions photographs and photosimulations from each KOP are presented with all other figures in VISUAL RESOURCES Appendix A-5.

ELEMENTS OF THE VISUAL SETTING

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

¹ The use of KOPs or similar view locations is common in visual resource analysis. The US Bureau of Land Management and the US Forest Service use such an approach.

Visual Quality

Visual quality is an expression of the visual impression or appeal of a given landscape and the associated public value attributed to the visual resource. This analysis used an approach that considers visual quality as ranging from outstanding to low. Outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as “picture postcard” landscapes. Low visual quality describes landscapes that are often dominated by visually discordant human alterations, and do not provide views that people would find inviting or interesting (Buhyoff et al., 1994).

Viewer Concern

Viewer concern is a measurement of the level of viewer interest regarding the visual resources in an area. Official statements of public values and goals reflect viewers’ expectations regarding a visual setting. This analysis also employed land use as an indicator of viewer concern. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are generally considered to have high viewer concern. Travelers on other highways and roads, including those in agricultural areas, may have moderate viewer concern depending on viewer expectations as conditioned by regional and local landscape features. Commercial uses, including business parks, typically have low-to-moderate viewer concern, though some commercial developments have specific requirements related to visual quality, with respect to landscaping, building height limitations, building design, and prohibition of above-ground utility lines, that indicate high viewer concern. Industrial uses typically have the lowest viewer concern because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

Viewer Exposure

The visibility of a landscape feature, the viewing distance to the landscape feature, the number of viewers, and the duration of the view all affect the exposure of viewers to a given landscape feature. Visibility is highly dependent on screening and angle of view. The smaller the degree of screening and/or the closer the feature is to the center of the view area, the greater its visibility is. Increasing distance reduces visibility. Viewer exposure can range from low values for all factors, such as a partially obscured and brief background view for a few motorists, to high values for all factors, such as an unobstructed foreground view from a large number of residences.

Visual Sensitivity

The overall level of sensitivity of a view area to impacts due to visual change is a function of visual quality, viewer concern, and viewer exposure and can range from low to high.

TYPES OF VISUAL CHANGE

To assess the visual changes that the project would cause, staff considered the following factors:

Contrast

Visual contrast describes the degree to which a project's visual characteristics or elements (consisting of form, line, color, and texture) differ from the same visual elements established in the existing landscape. The degree of contrast can range from low to high. The presence of forms, lines, colors, and textures in the landscape similar to those of a proposed project indicates a landscape more capable of accepting those project characteristics than a landscape where those elements are absent. This ability to accept alteration is often referred to as visual absorption capability and typically is inversely proportional to visual contrast.

Dominance

Another measure of visual change is project dominance. Dominance is a measure of a feature's apparent size relative to other visible landscape features and the total field of view. A feature's dominance is affected by its relative location in the field of view and the distance between the viewer and the feature. The level of dominance can range from subordinate to dominant.

View Blockage

View blockage describes the extent to which any previously visible landscape features are blocked from view by the project. Blockage of higher quality landscape features by lower quality features causes adverse visual impacts. The degree of view blockage can range from none to high.

APPENDIX A – 3

LIGHTING COMPLAINT RESOLUTION FORM

Woodland Generation Station 2 Stanislaus County, California
Complainant's name and address: Phone number:
Date complaint received: Time complaint received:
Nature of lighting complaint:
Definition of problem after investigation by plant personnel:
Date complainant first contacted:
Description of corrective measures taken:
Complainant's signature: _____ Date: _____
Approximate installed cost of corrective measures: \$
Date installation completed: Date first letter sent to complainant: _____ (copy attached) Date final letter sent to complainant: _____ (copy attached)
This information is certified to be correct: Plant Manager's Signature:

(Attach additional pages and supporting documentation, as required.)

VISUAL RESOURCES APPENDIX A – 4: PLUME ANALYSIS

Modesto Irrigation District Woodland Generation Station Unit 2 Project Cooling Tower and HRSG Exhaust Visible Plume Analysis Testimony of William Walters

Visible plumes from the cooling tower and HRSG exhaust would occur from the WGS2 project during periods of cold weather or cool wet weather. The actual frequency of occurrence is weather and turbine operation dependent and would vary from year to year. Additionally, plumes can form during the daytime or nighttime; however, the meteorological data reviewed indicates that conditions for plume formation are most prevalent during nighttime and early morning hours.

The following provides the assessment of the Modesto Irrigation District (MID) Woodland Generation Station Unit 2 (WGS2) Project cooling tower and heat recovery steam generator (HRSG) exhaust stack visible plume modeling analyses conducted by the Applicant. Staff conducted separate modeling analyses for comparison.

MID COOLING TOWER MODELING ANALYSIS

The Applicant's SPPE Application and Data Request Responses #31 to #36 were evaluated and an independent psychrometric analysis and dispersion modeling analysis was performed to determine the validity of the Applicant's plume analysis.

The following was determined through a review of the Applicant's Cooling Tower plume modeling and by performing a separate plume analysis:

- The Applicant only provided one year of meteorological data. Generally several years of sequential meteorological data provides more representative modeling results.
- The Applicant used the ISC3ST dispersion model along with three additional plume-modeling modules (CLAUSIUS, DISTANCE and COUNT) to determine cooling tower plume frequency and dimensions. In performing their analysis the Applicant modeled a single cooling tower cell, which in Staff's opinion will underestimate the plume dimensions for the three-cell cooling tower.
- The Applicant provided no data for the small existing one-cell cooling tower. However, the existing cooling tower is estimated to be approximately 1/20th the heat rejection rate of the WGS2 proposed three-cell cooling tower; therefore, it is not considered to have a comparable plume potential.

The cooling tower operating and exhaust parameters provided by the applicant are as follows:

Table 1 – Cooling Tower Operating and Exhaust Parameters Provided by the Applicant

PARAMETER	NEW COOLING TOWER
Number of Cells	3
Heat Rejection Rate	85 MW
Stack Height	12.2 meters
Stack Diameter	8.534 meters (per cell)
Exhaust Temperature	299.11°K
Exit Velocity	6.81 m/s
Inlet Air Flow	1,410 kg/s
Exhaust mass flow rate ¹	10,841,000 lb/hr
Moisture Content (% by weight) ²	2.0788%

¹ – Exhaust mass flow rate calculated using the exit velocity, stack diameter, and exhaust temperature.

² – Moisture content was calculated assuming saturation at the exhaust temperature.

The ISC3ST modeling run results provided by the Applicant using 1976 Stockton meteorological data supplied by the Applicant and the corresponding CSVP modeling results determined through additional modeling by Staff are provided in Tables 2 and 3.

**Table 2 – Predicted Hours with Cooling Tower Steam Plumes
Stockton 1976 Meteorological Data**

	Applicant's Results		Staff's Results	
	Total	Percent	Total	Percent
All Hours				
Daylight	1,519	34.16%	1,112	25.01%
Nighttime	2,558	58.98%	2,667	61.49%
Total	4,077	46.41%	3,779	43.02%
Seasonal Daylight	ND	ND	976	48.44%

**Table 3 – Modeled Cooling Tower Plume Dimensions
1976 Stockton Meteorological Data**

Parameter	Percent ²	Applicant – ISC3ST ¹		CEC – CSVP Model ¹	
		Annual	Seasonal Daylight ³	Annual	Seasonal Daylight ³
All Hours					
Length (m)	50%	No Plume	ND	No Plume	No Plume
	10%	80	ND	165	116
	5%	120	ND	204	176
	Maximum	700	ND	410	410
Height (m)	50%	No Plume	ND	No Plume	No Plume
	10%	72	ND	61	61
	5%	87	ND	70	77
	Maximum	268	ND	210	210
Width (m)	50%	No Plume	ND	No Plume	No Plume
	10%	35	ND	31	30
	5%	50	ND	38	37
	Maximum	186	ND	70	70

¹ - The two models used to predict plume dimensions are: (ISC3ST) with three additional calculation modules, and the Combustion Stack Visible Plume Model.

² - The 50% frequency value is the median value.

³ – November to April Daylight Hours are the hours in consideration to determine plume significance.
 ND – No Data Provided.

The total frequency results predicted by the Applicant and staff are similar, but staff predicts a higher differential between daytime and nighttime plume occurrence. The plume length and height predicted by the Applicant and staff are also generally similar; however, the Applicant on average predicts somewhat higher plumes with less plume length than predicted by staff. The Applicant also predicts wider plumes than staff.

Since the Applicant’s meteorological data was limited to one year and did not include weather phenomena or visibility data, staff obtained additional meteorological data from the National Climatic Data Center (NCDC) for use in the modeling analysis. The data obtained is from Fresno, which is approximately 90 miles southeast of the project site. The NCDC also has Stockton and Sacramento data; however, the Stockton data set only included eight hours of data per day and the general wind patterns in Sacramento were not considered as representative as Fresno for this site. This Fresno meteorological data set contains data regarding weather phenomena (i.e. fog, rain, etc.) and visibility. Tables 4 and 5 provide the all hours and daylight no fog/no rain hours CSVP plume frequency results and the CSVP and SACTI cooling tower modeling plume dimension results for this five-year meteorological data set.

**Table 4 – Staff Predicted Hours with Cooling Tower Steam Plumes
 CSVP Model - Fresno 1990 to 1994 Meteorological Data**

	WGS2 Cooling Tower	
	Total	Percent
All Hours	16,574	37.82%
Seasonal Daylight	2,898	35.39%
Seasonal Sunrise to 10 am	1,433	65.98%

The percentages shown in this table represent the percentage of the quantity listed (i.e. all hours = 43,818 hours, seasonal November-April daylight hours = 8,188 hours, seasonal sunrise to 10 am hours = 2,172 hours).

**Table 5 – Staff Modeled Cooling Tower Plume Dimensions
 1990 to 1994 Fresno Meteorological Data**

	Percent	CSVP Model	SACTI Model
All Hours			
Length (m)	50%	No Plume	>30
	10%	177	>300
	5%	234	>300
	Maximum	508	>800
Height (m)	50%	No Plume	>20
	10%	67	>70
	5%	78	>80
	Maximum	189	>90
Width (m)	50%	No Plume	>20
	10%	34	>60
	5%	43	>60
	Maximum	85	>80
Seasonal Daylight No Fog/Rain Hours			
Length (m)	50%	No Plume	>20

**Table 5 – Staff Modeled Cooling Tower Plume Dimensions
1990 to 1994 Fresno Meteorological Data**

	Percent	CSVP Model	SACTI Model
	10%	71	>200
	5%	85	>300
	Maximum	183	>700
Height (m)	50%	No Plume	>20
	10%	50	>50
	5%	74	>70
	Maximum	185	>200
Width (m)	50%	No Plume	>20
	10%	25	>40
	5%	32	>60
	Maximum	67	>60
Seasonal Daylight to 10 am No Fog/Rain Hours			
Length (m)	50%	49	ND
	10%	91	ND
	5%	105	ND
	Maximum	183	ND
Height (m)	50%	26	ND
	10%	80	ND
	5%	106	ND
	Maximum	184	ND
Width (m)	50%	15	ND
	10%	34	ND
	5%	40	ND
	Maximum	67	ND

ND – No Data Provided.

No Plume – Plumes are not predicted to occur at the listed frequency.

The SACTI modeling results using the Fresno meteorological data predicts somewhat longer plumes than those predicted using either the ISC3ST model or CSVP model using the Stockton meteorological data; or the CSVP model using the Fresno Meteorological data. The SACTI model uses different dispersion curves than those used in the other two models, which is a likely the reason for the longer plume predications. For this site urban dispersion curves, as contained in the ISC3ST and CSVP models, are more appropriate than those used by the SACTI model.

HRSG PLUME ANALYSIS

The Applicant's SPPE Application and Data Request Responses #37 and #38 were evaluated and an independent psychrometric analysis and dispersion modeling analysis was performed to determine the validity of the Applicant's plume analysis. The Combustion Stack Visible Plume (CSVP) model was used to estimate the potential plume frequency, and provide data on predicted plume length, width, and height for the WGS2 HRSG. This site also has an existing HRSG stack (Woodland 1), and plume data are presented for each stack individually. It is unlikely that significant plume interaction could occur due to the stack separation and the different exhaust conditions (i.e. plume rise) for these two units.

HRSG PARAMETERS

The Applicant modeled two turbine operating conditions (100% load w/duct firing and water injection, and minimum load). The Applicant also modeled the existing Woodland 1 HRSG stack. The operating data for these stacks are provided in Table 6.

**Table 6 - HRSG Exhaust Parameters
Provided by the Applicant**

Parameter	HRSG Stack Value		
	WGS2 Full Load w/Duct Burner and Water Injection	WGS2 Minimum Load	Existing HRSG Stack Full Load w/Power Augmentation
Stack Height	25.9 or 33.5 meters ^a	25.9 or 33.5 meters ^a	24.9 meters
Stack Diameter	3.048 meters	3.048 meters	3.569 meters
Exhaust Temperature	360.22°K	384.11°K	438.56°K
Exit Velocity	19.78 m/s	14.44 m/s	21.40 m/s
Exhaust mass flow rate	1,078,583 lb/hr	752,962 lb/hr	1,274,276 lb/hr
Exhaust Molecular Weight	27.86 lbs/lb-mol	28.40 lbs/lb-mol	27.01 lbs/lb-mol
Moisture Content (% by weight)	8.44%	3.77%	12.75%

a – The HRSG design calls for an 85 foot (25.9 meter) stack, and the OSTG design calls for a 110 foot (33.5 meter) tall stack.

APPLICANT HRSG MODELING RESULTS SUMMARY

The Applicant modeled the HRSG stack conditions provided above with the ISC3ST model and three plume modeling modules (CLAUSIUS, DISTANCE, and COUNT) and staff modeled these conditions using the CSVP model. Tables 7 and 8 present the predicted plume frequency and dimension summary of the Stockton meteorological data modeling results:

**Table 7 – Predicted Hours with HRSG Steam Plumes
Stockton 1976 Meteorological Data**

	Applicant's Results		Staff's Results	
	Total	Percent	Total	Percent
New Turbine – Full Load w/Duct Firing and Power Augmentation				
Daylight	1,060	23.84%	913	20.53%
Nighttime	1,983	45.72%	2,351	54.21%
Total	3,043	34.64%	3,264	37.16%
New Turbine – Minimum Load				
Daylight	4	0.09%	10	0.22%
Nighttime	4	0.09%	8	0.18%
Total	8	0.09%	18	0.20%
Existing Turbine				
Daylight	572	12.86%	479	10.77%
Nighttime	1,080	24.90%	1,486	34.26%
Total	1,652	18.81%	1,965	22.37%

Staff predicts a slightly higher total plume frequency and a lower daytime plume frequency than is predicted by the Applicant. The daylight frequency modeling results may be considered significant because the daylight frequencies are greater than 10%. Due to the very low frequency of occurrence predicted for the minimum load condition no additional analysis for this condition is presented.

The ISC3ST/CLAUSIUS/DISTANCE/COUNT and CSVP model predicted plume size characteristics provided by the Applicant and determined by staff are as follows:

**Table 8- Predicted HRSG Steam Plume Dimensions (meters)
1976 Stockton Meteorological Data**

	Percent ²	Applicant – ISC3ST ¹ Drum-Type HRSG		Applicant – ISC3ST ¹ OTSG HRSG		CEC – CSVP Model ¹ OTSG HRSG	
		Annual	Seasonal Daylight ³	Annual	Seasonal Daylight ³	Annual	Seasonal Daylight ³
All Hours							
Length (m)	50%	No Plume	ND	No Plume	ND	No Plume	No Plume
	10%	160	ND	120	ND	89	66
	5%	220	ND	180	ND	113	99
	Maximum	1100	ND	1000	ND	254	254
Height (m)	50%	No Plume	ND	No Plume	ND	No Plume	No Plume
	10%	92	ND	96	ND	93	89
	5%	109	ND	114	ND	124	123
	Maximum	329	ND	318	ND	320	320
Width (m)	50%	No Plume	ND	No Plume	ND	No Plume	No Plume
	10%	53	ND	51	ND	17	17
	5%	72	ND	70	ND	22	22
	Maximum	242	ND	237	ND	45	45
	Percent ²	Applicant – ISC3ST ¹ Woodland 1 HRSG		CEC – CSVP Model ¹ Woodland 1 HRSG			
		Annual	Seasonal Daylight ³	Annual	Seasonal Daylight ³		
All Hours							
Length (m)	50%	No Plume	ND	No Plume	No Plume		
	10%	140	ND	117	83		
	5%	220	ND	151	133		
	Maximum	1800	ND	346	346		
Height (m)	50%	No Plume	ND	No Plume	No Plume		
	10%	109	ND	104	100		
	5%	137	ND	154	140		
	Maximum	425	ND	436	436		
Width (m)	50%	No Plume	ND	No Plume	No Plume		
	10%	65	ND	23	22		
	5%	93	ND	28	28		
	Maximum	295	ND	60	60		

¹ - The two models used to predict plume dimensions are: (ISC3ST) with three additional calculation modules, and the Combustion Stack Visible Plume Model.

² - The 50% frequency value is the median value.

³ - November to April Daylight Hours are the hours in consideration to determine plume significance.

ND – No Data Provided.

No Plume – Plumes are not predicted to occur at the listed frequency.

The Applicant generally predicts longer and wider plumes than staff predicts. Both Applicant and staff predict similar plume heights.

STAFF CSVP FRESNO METEOROLOGICAL DATA MODELING ASSESSMENT

The 1976 Stockton meteorological data set provided by the Applicant was considered insufficient for a complete visual analysis as it was only for a single year and did not include weather/visibility data. As noted previously staff compiled a five-year Hourly United States Weather Observation (HUSWO) meteorological data set from NCDC data to model the HRSG plume potential using the CSVP model. The predicted HRSG visible plume occurrence frequency estimated by the CSVP model are shown below:

**Table 9 – Staff Predicted Hours with HRSG Steam Plumes
Fresno 1990 to 1994 Meteorological Data**

	WGS2 OTSG HRSG w/Duct Firing and Water Injection		Woodland 1 HRSG Stack Full Load w/Power Augmentation	
	Total	Percent	Total	Percent
All Hours	14,639	33.41%	8,987	20.51%
Seasonal Daylight	2,231	27.25%	747	9.12%
Seasonal Sunrise to 10 am	1,229	56.58%	524	24.13%

The percentages shown in this table represent the percentage of the quantity listed (i.e. all hours = 43,818 hours, seasonal November-April daylight hours = 8,188 hours, seasonal sunrise to 10 am hours = 2,172 hours).

These results indicate that the visible plume formation will mainly occur during the cold weather months, with the majority of plume formation occurring at night or early morning. The seasonal daylight and seasonal daylight morning plume frequency for the WGS2 HRSG may be considered significant since it is well above 10% and more than twice that of the existing HRSG. The CSVP predicted plume size characteristics are as follows:

**Table 10 - Staff Predicted HRSG Steam Plume Dimensions (meters)
Fresno 1990 to 1994 Meteorological Data**

	WGS2 OTSG HRSG w/Duct Firing and Water Injection			Existing HRSG Stack Full Load w/Power Augmentation		
	Length (m)	Height (m)	Width (m)	Length (m)	Height (m)	Width (m)
All Hours						
50%	No Plume	No Plume	No Plume	No Plume	No Plume	No Plume
10%	96	114	20	123	121	24
5%	137	174	27	176	202	35
Maximum	310	294	54	430	403	73
Seasonal Daylight Hours No Fog/No Rain						
50%	No Plume	No Plume	No Plume	No Plume	No Plume	No Plume
10%	62	77	14	No Plume	No Plume	No Plume
5%	86	118	19	60	77	18
Maximum	227	276	44	160	380	59
Seasonal Sunrise to 10 am Hours No Fog/No Rain						
50%	29	46	8	No Plume	No Plume	No Plume
10%	93	127	20	68	98	21
5%	127	179	26	84	226	33
Maximum	227	276	44	160	380	59

No Plume – Plumes are not predicted to occur at the listed frequency

The predicted seasonal plume size data indicates that factoring length, height and width the 5% and 10% predicted plumes from the WGS2 HRSG are similar in size to the existing HRSG plumes. However, the existing HRSG is predicted to have a larger maximum plume size.

PLUME ABATEMENT METHODS

COOLING TOWER PLUME ABATEMENT

Cooling tower plumes can be abated through significant cooling apparatus design modification or through modifying the exhaust flow of the cooling tower. Three potential abatement methods are provided for discussion: 1) air-cooled condensers; 2) wet/dry or hybrid cooling systems; 3) over sizing tower air flow. The use of once-through cooling will also eliminate plumes; however, this option is not available to this project location.

AIR-COOLED CONDENSERS

Air-cooled condensers, in place of a wet cooling tower, completely eliminate the potential for plume formation; however, this technology is much more expensive (as much as 10 times as expensive) than a traditional cooling tower, requires more space, and creates a much higher structure that may itself impact project visual resources. The operating costs are also much higher due to the higher electrical demand for the fans. Generally, air-cooled condensers are only recommended for power plant installations when water constraints will not allow for wet cooling technologies.

WET/DRY AND HYBRID COOLING TOWERS

Wet/dry or hybrid cooling tower systems can also be used to lessen or completely eliminate plume formation during normal weather conditions. Hybrid systems are also more expensive (approximately 1.5 to 3 times as expensive) as traditional cooling towers and have higher operating costs. However, the relative cost of these systems is decreasing as their use has become more frequent and more cooling tower manufacturers are entering this market. The size of these systems is dependent on the specific design; however, in general these towers will either increase in footprint size or in height compared to a conventional wet cooling tower. Water use will decrease in proportion to the heat duty of the dry section of the wet/dry or hybrid tower. Noise emissions from wet/dry and hybrid towers are dependent on the specific design, but some cases are essentially equivalent to the noise emissions from conventional wet cooling towers.

OVER SIZING TOWER AIR FLOW

Increasing tower air flow rates (i.e. decreasing L/G) can reduce the frequency, size and density of plume formation. The increase in air flow causes the exhaust temperature and moisture content to move down the saturation curve, which then requires less dispersion to dissipate the plume, resulting in less frequent plumes and smaller plumes. This may be accomplished through providing oversized variable speed fans and motors and additional air intake area. However, this method is not as effective as the other plume abatement methods and would

increase the size of the cooling tower, which may increase the capital cost as much as a wet/dry or hybrid design and would likely have a higher associated operating cost.

Recent project proponents have proposed all three of these design modifications to eliminate or mitigate cooling tower plumes.

HRSG PLUME ABATEMENT

There are two methods that can be used alone or together, to reduce HRSG plume formation. These two methods are 1) increasing the stack temperature, and 2) decreasing the water content of the exhaust.

INCREASE STACK TEMPERATURE

Stack temperature can be increased by transferring less heat from the exhaust gas to the steam that is produced in the HRSG. This can be accomplished by using an economizer bypass during cold weather as is being done at the Crockett facility, but will result in a small loss in efficiency and total MW production. This method is relatively easy to monitor.

DECREASE EXHAUST WATER CONTENT

The water content in HRSG exhausts come from four different sources: 1) water from the ambient inlet air; 2) water produced in the combustion process 3) water added for power augmentation/emissions control; and 4) water added from aqueous ammonia injection at the SCR NO_x emissions control system. It is not feasible to reduce the water content of the ambient air; the amount of water added into SCR system for the WGS2 is only approximately 0.1% of the total water in the exhaust; and the water injection/power augmentation (~25% of the water in the exhaust) also serves as a NO_x control measure for the WGS2 turbine. Therefore, the most feasible method for the WGS2 project to reduce the HRSG exhaust water content is to reduce duct firing. Based on information provided in the application the duct firing accounts for approximately 24% of the total water content in the exhaust when firing at full turbine load and full duct firing and power augmentation. Water content reductions of this magnitude could easily reduce the HRSG plume frequencies to those of the existing HRSG, or lower.

The reduced steam production that will result from reduced duct firing will lower the heat rejection load of the cooling tower, which can reduce the frequency and plume dimensions from the cooling tower. This is similar in strategy to over sizing the fans/inlet air requirements of the tower as noted above.

It should be noted that power produced by duct firing is less efficient than power produced without duct firing, so limiting duct firing actually increases overall fuel efficiency. Limiting duct firing will significantly decrease total available MW production. However, HRSG plume mitigation requirements would not be necessary during normal periods of high demand (i.e. summer afternoons). In fact, the application (MID 2001a, p. 2-1) notes that this plant will be operated in a load demand following manner, so it seems unlikely that maximum duct firing would be

necessary during the cold weather morning periods that would be subject to any conditions to reduce HRSG plume formation.

**VISUAL RESOURCES APPENDIX A – 5: VISUAL RESOURCES
FIGURES**

VISUAL RESOURCES FIGURES 1 THROUGH 15

VISUAL RESOURCES Figure 12

(8 1/2 x 11)

[MID 2001a, Figure 8.11-6 and MID Data Response Figure 8.11-7R1]

VISUAL RESOURCES Figure 233

(8 1/2 x 11)

[MID 2001a Figure 8.11-2 #1]

VISUAL RESOURCES Figure 3
(8 1/2 x 11)
[MID 2001a Figure 8.11-2 #2]

VISUAL RESOURCES Figure 4
(11 x 17)
[MID 2001a Figure 8.11-25 #7]

VISUAL RESOURCES Figure 5
(8 1/2 x 11)
[MID 2001a Figure 8.11-5 #8]

VISUAL RESOURCES Figure 6

(8 1/2 x 11)

[MID 2001b Figure 1]

VISUAL RESOURCES Figure 7
(8 1/2 x 11)
Pipeline – West Ripon Road

VISUAL RESOURCES Figure 8

(8 1/2 x 11)

[MID 2001b Figure 2]

VISUAL RESOURCES Figure 9
(8 1/2 x 11)
108 Pipeline – Agricultural Fields

VISUAL RESOURCES Figure 10A
(8 1/2 x 11)
[MID Data Response Figure 8.11-8aR1]

VISUAL RESOURCES Figure 10B
(8 1/2 x 11)
[MID Data Response Figure 8.11-8bR1]

VISUAL RESOURCES Figure 11A
(8 1/2 x 11)
[MID Data Response Figure 8.11-9aR1]

VISUAL RESOURCES Figure 11B
(8 1/2 x 11)
[MID Data Response Figure 8.11-9bR1]

VISUAL RESOURCES Figure 12A

(8 1/2 x 11)

[MID 2001a Figure 8.11-10a]

VISUAL RESOURCES Figure 12B

(8 1/2 x 11)

[MID 2001a Figure 8.11-10b]

VISUAL RESOURCES Figure 13A

(8 1/2 x 11)

[MID 2001a Figure 8.11-11a]

VISUAL RESOURCES Figure 13B

(8 1/2 x 11)

[MID 2001a Figure 8.11-11b]

VISUAL RESOURCES Figure 14
(8 1/2 x 11)
Plume Simulation to be Submitted by Applicant

VISUAL RESOURCES Figure 15
(8 1/2 x 11)
KOP 1 Night Lighting Photograph

GENERAL CONDITIONS OF EXEMPTION

WOODLAND GENERATION STATION 2 01-SPPE-1

The WGS2 Project Compliance Plan has been established as required by Section 25532 of the Public Resources Code. The plan provides a means for assuring that the facility is constructed and operated in compliance with air and water quality, public health and safety, other applicable laws, ordinances, regulations, and standards, and Conditions of Exemption.

The Compliance Plan is divided into two sections:

1. Compliance general Conditions of Exemption which specify the framework for record keeping and reporting throughout the construction and operation phases of the project; and,
2. Conditions of Exemption which contain measures that must be taken to mitigate any and all potential adverse project impacts to an insignificant level.

The compliance general conditions are presented first. The Conditions of Exemption follow and are organized by technical area.

Each Condition of Exemption has a verification statement describing the means by which compliance with the condition can be verified. The verification procedures may be modified by the Commission Compliance Project Manager (CPM) as necessary to ensure compliance with the adopted Conditions of Exemption. Verification of compliance with the conditions will also be accomplished by periodic reports filed by MID as required by the general conditions, auditing of project records, and by staff inspections of the power plant site and related facilities.

GENERAL CONDITIONS OF EXEMPTION

I. DEFINITIONS

To ensure consistency, continuity, and efficiency, the following terms, as defined, apply to all technical areas, including Conditions of Exemption:

SITE MOBILIZATION

Moving trailers and related equipment onto the site, usually accompanied by minor ground disturbance, grading for the trailers and limited vehicle parking, trenching for utilities, installing utilities, grading for an access corridor, and other related activities. Ground disturbance, grading, etc. for site mobilization are limited to the portion of the site necessary for placing the trailers and providing access and parking for the occupants. Site mobilization is for temporary facilities and is therefore not considered construction.

GROUND DISTURBANCE

On-site activity that results in the removal of soil or vegetation, boring, trenching, or alteration of the site surface. This does not include driving or parking a passenger vehicle, pickup truck, or other light vehicle, or walking on the site.

GRADING

On-site activity conducted with earth-moving equipment that results in alteration of the topographical features of the site such as leveling, removal of hills or high spots, or moving of soil from one area to another.

CONSTRUCTION

[From section 25105 of the Warren-Alquist Act.] On-site work to install permanent equipment or structures for any facility. Construction does **not** include the following:

- a. The installation of environmental monitoring equipment.
- b. A soil or geological investigation.
- c. A topographical survey.
- d. Any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility.
- e. Any work to provide access to the site for any of the purposes specified in a., b., c., or d.

II. COMPLIANCE PROJECT MANAGER

A Compliance Project Manager (CPM) will be designated to oversee compliance with the general compliance conditions and Conditions of Exemption. The assigned CPM, after consultation with the appropriate technical staff, and approval of Energy Commission management and responsible agencies, shall:

1. Ensure that compliance files are established and maintained for the WGS2 project;
2. Track compliance filings;
3. Ensure the timely processing of proposed changes to the Energy Commission Decision;
4. Use all available means to encourage the resolution of disputes; and,
5. Coordinate compliance monitoring activities of Energy Commission and delegate agency staff.

III. PROJECT OWNER RESPONSIBILITY

It shall be the responsibility of the project's owner and operator, MID, to ensure that the compliance general conditions and all Conditions of Exemption are satisfied. MID must comply with the Conditions of Exemption and compliance general conditions. Failure to comply with any of the Conditions of Exemption or the

compliance general conditions may result in reopening of the case and revocation of the SPPE, or other action as appropriate.

MID shall send all verification submittals to the CPM whether such condition was satisfied or work performed by MID or other agent, and whether or not such verification was also submitted to the CPM by an agent.

IV. COMPLIANCE RECORD

MID shall maintain, for the life of the project, files of all Conditions of Exemption and compliance general condition-related correspondence, and final as-built drawings.

The Energy Commission shall maintain as a public record:

1. All documents received regarding compliance with the compliance general conditions and Conditions of Exemption;
2. All complaints filed with the Energy Commission; and,
3. All petitions for changes to conditions and documentation of the resulting staff or Energy Commission action taken.

V. COMPLIANCE SUBMITTALS

All compliance submittals and correspondence pertaining to compliance matters shall include a cover letter with a description of the submittal and a reference to the compliance general condition and/or the Condition(s) of Exemption number(s) which the submittal is intended to satisfy.

All submittals shall be addressed as follows:

**Compliance Project Manager
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814**

VI. CONSTRUCTION COMPLIANCE REPORTS

The project owner must submit construction compliance reports 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. These reports, and the requirement for an accompanying compliance matrix, are described below.

COMPLIANCE MATRIX

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly compliance report. The compliance matrix is intended to provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

1. the technical area,
2. the condition number,

3. a brief description of the verification action or submittal required by the condition,
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.),
5. the expected or actual submittal date,
6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable, and
7. the compliance status for each condition (e.g., “not started,” “in progress,” or “completed date”).

Completed or satisfied conditions do not need to be included in the compliance matrix after they have been identified as completed/satisfied in at least one monthly compliance report.

PRE-CONSTRUCTION MATRIX

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner's **first** compliance submittal. It will be in the same format as the compliance matrix referenced above.

TASKS PRIOR TO START OF CONSTRUCTION

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Project owners frequently anticipate starting project construction as soon as the project is exempted. In some cases it may be necessary for the project owner to file submittals prior to exemption if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that pre-construction activities that are initiated prior to exemption are performed at the owner's own risk. Failure to allow specified lead-time may cause delays in start of construction.

Various lead times for verification submittals to the CPM for Conditions of Exemption 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.

The first construction Monthly Compliance Report is due the month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies of the Monthly Compliance

Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

1. A summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. Documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. An initial, and thereafter updated, compliance matrix which shows the status of all Conditions of Exemption (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
4. A list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
5. A list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. A cumulative listing of any approved changes to Conditions of Exemption;
7. A listing of any filings with, or permits issued by, other governmental agencies during the month;
8. A projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with Conditions of Exemption;
9. A listing of the month's additions to the on-site compliance file; and
10. Any requests to dispose of items that are required to be maintained in the project owner's compliance file.
11. A listing of complaints, notices of violation, official warnings, and citations received during the month; a description of the resolution of any complaints that have been resolved, and the status of any unresolved complaints.

VII. CONFIDENTIAL INFORMATION

Any information that MID deems proprietary shall be submitted to the Energy Commission Docket Unit (Mail Stop 4) to be processed pursuant to California Code of Regulations Title 20 section 2505(a). Any information which is determined to be confidential shall be kept confidential as provided for in CCR Title 20 section 2501 et seq. Information deemed not to be confidential will become public information.

VIII. ACCESS TO THE FACILITY

The CPM, or other designated Energy Commission staff or agent, shall be guaranteed and granted access at any time to the project site, transmission line right-of-way, and related sites to conduct audits, inspections, surveys, or general site visits.

IX. POST CERTIFICATION CHANGES TO THE COMMISSION DECISION

For the life of the project, MID must provide written notification to the CPM when planning changes to the project description. When a proposed change affects the Conditions of Exemption, MID must file a petition for the change with the CPM. The petition must contain the following information:

1. A complete description of the proposed modification(s), including proposed new language for the Condition(s) of Exemption that will be affected;
2. A discussion of the necessity for the proposed modification(s), including an explanation of why the modification was not considered during the original exemption proceeding for the project, and an explanation of the new information that has made the proposed modification necessary;
3. An analysis of the potential impacts the modification may have on the environment and the proposed measures to mitigate all potential impacts to a level of insignificance; and
4. A list of the property owners potentially affected by the proposed modifications.

The CPM will review petition filings and may authorize those petitions where there is no possibility that the modification(s) will result in a significant effect on the environment, or cause the project not to comply with any applicable laws, ordinances, regulations, or standards. Full Energy Commission approval will be required for petitions that do not meet the above criteria.

A. OWNERSHIP OR OPERATOR CHANGES

The project owner must notify the CPM in writing of any changes in ownership including identification of the new owner (contact person, address, phone number), any changes in the operational relationship between the owner and the operator, and a statement signed by the new owner that the new owner understands the Compliance Plan and the Conditions of Exemption, and agrees to abide by those duties and obligations as described and intended by the Conditions of Exemption.

The project owner of record must provide to the CPM notice of any change in project ownership, as described above, for the life of the project.

KEY EVENT LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

EVENT DESCRIPTION	DATE
Certification Date	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Rough Grading	
Start Construction	
First Combustion of Gas Turbine	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
Synchronization with Grid	
Complete T/L Construction	
FUEL SUPPLY LINE ACTIVITIES	
Start Fuel Supply Line Construction	
Complete Fuel Supply Line Construction	
WATER SUPPLY LINE ACTIVITIES	
Start Water Supply Line Construction	
Complete Water Supply Line Construction	

PREPARATION TEAM

Project Manager.....	Susan Lee
Staff Counsel.....	Kerry Willis
Project Secretary.....	Luz Manriquez
Agriculture Resources	Negar Vahidi
Aesthetics	Michael Clayton
Air Quality.....	William Walters
Biological Resources	Sandy Etchell
Cultural Resources.....	Roger Mason
Energy Resources.....	James Henneforth
Executive Summary.....	Susan Lee
General Conditions of Exemption.....	Susan Lee
Geology, Paleontology, Soils, and Mineral Resources	Neal Mace
Hazardous Materials and Waste	Alvin Greenberg
Hydrology and Water Quality.....	Ken Schwarz
Introduction.....	Rebecca Morgenstern
Land Use and Recreation.....	Negar Vahidi
Noise	Jim Buntin
Project Description	Rebecca Morgenstern
Public Health	William Walters
Socioeconomics	Michael Fajans
Traffic and Transportation.....	Jason Issac
Transmission Line Safety and Nuisance	Obed Odoemelum
Transmission System Engineering	Al McCuen
Transmission Lines	Ajoy Guha