AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

December 4, 2008

FELICIA MILLER
PROJECT MANAGER
CALIFORNIA ENERGY COMMISSION
1516 NINTH ST
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Final Determination of Compliance
Orange Grove Energy Project

Enclosed is the San Diego County Air Pollution Control District (District) Final Determination of Compliance (FDOC) for the Orange Grove Energy Project (No. 08-AFC-4) proposed by Orange Grove Energy, L.P. The FDOC includes the District's evaluation of the project's compliance with applicable District rules and regulations.

The District has determined that the project as proposed will comply with all applicable District rules and regulations if it is constructed and operated in accordance with the information submitted in conjunction with the application(s) for District Authority to Construct, the application for certification submitted to the CEC, and the terms and conditions of the FDOC.

If you have any questions concerning the above or the enclosed FDOC, please contact the undersigned at (858) 586-2747 or John Annicchiarico, Senior Air Pollution Control Engineer, at (858) 586-2733.

Sincerely,

Camqui Nguyen

CAMQUI NGUYEN
Associate Air Pollution Control Engineer

FINAL
DETERMINATION OF COMPLIANCE

ORANGE GROVE PROJECT

SAN DIEGO AIR POLLUTION CONTROL DISTRICT

Application Number 985708

December 4, 2008

Camqui Nguyen

John Annicchiarico

Senior Engineer: **John Annicchiarico**

Project Engineer: **Camqui Nguyen**

Application Number: **985708**

Site ID Number: **11382A**
Fee Schedule: **20F**
BEC: **New**

I. APPLICATION INFORMATION

Owner / Operator:	Orange Grove Energy, L.P
Mailing Address:	1900 East Golf Road, Suite 1030 Schaumburg, IL 60173
Equipment Address:	10300 Pala Road Pala, CA 92059
Contact:	Stephen Thome
Position:	Vice President of Development
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I. PROJECT DESCRIPTION

Orange Grove Energy, L.P proposes to develop the Orange Grove Project (OGP), a 96 megawatt (MW) electric generating facility. This project is a simple cycle peaking power generating plant built in response to a Request for Offers (RFO) by San Diego Gas & Electric (SDG&E) for new generating resource to support local reliability during peak demand. The project will utilize two General Electric (GE) LM6000 PC SPRINT combustion turbine generators (CTGs) fueled with natural gas, a black start engine fueled with natural gas and an emergency diesel fire pump engine. The project also includes a wet cooling tower for cooling the air inlet chiller system, air cooling for the fuel gas compressor and general lube oil systems, reverse osmosis unit to recycle water for plant processes, and a septic system to dispose sanitary waste from the OGP.

The OGP is subject to the approval of the California Energy Commission (CEC) because the proposed power plant has a nominal rating greater than 50 MW. Orange Grove, L.P filed an application for certification (AFC) with the CEC on June 19, 2008. The San Diego Air Pollution Control District (District) is considered a responsible agency for this approval and is required to submit a Preliminary Determination of Compliance (PDOC) and a Final Determination of Compliance (FDOC) to the CEC. Pursuant to District Rule 20.5 the FDOC review is functionally equivalent to an Authority to Construct review.

The OGP site is located on unincorporated lands north of State Route 76 and east of Interstate 15 in San Diego County. The site is about 5 miles east of the City of Fallbrook and approximately 2 miles west of the community of Pala.

The project will be fueled by natural gas, which will be supplied by the San Diego Gas and Electric Company. No provisions for use of an alternative fuel in the event of a curtailment of the natural gas supply are proposed by the applicant.

II. EQUIPMENT DESCRIPTION

Orange Grove, L.P has proposed to construct and operate the following equipment at this facility under applications No. 985708, 985709, 985710 and 985711:

- Two natural gas simple cycle combustion turbine generators, each consists of:

one nominal 49.8 MW natural-gas fired simple cycle General Electric LM6000 PC SPRINT combustion turbine generator, serial number to be determined, with water injection, a selective catalytic reduction (SCR) unit with automatic ammonia injection control system, an oxidation catalyst, data acquisition and handling system (DAHS), remote data collection node (RDCN) and continuous emission monitoring system (CEM).

- One 965 brake horsepower (bhp) Cummins GTA38-G2 natural gas fueled black start engine, serial number to be determined, with catalytic converter and air to fuel ratio controller, driving a 625 kilowatt (KW) generator
- One 373 bhp Cummins CFP11E-F10 diesel fueled emergency fire pump engine, serial number to be determined.

III. PROCESS DESCRIPTION

The OGP is a simple cycle peaking power plant that includes two combustion turbine generators (CTGs). Each CTG will drive an electrical generator which will produce nominally 49.8 MW of electricity. Each CTG will have water injection to control the combustion process and reduce nitrogen oxides (NOx) emissions. Emissions downstream of the combustion processes are further controlled with a selective catalytic reduction (SCR) system using aqueous ammonia to reduce NOx emissions to 2.5 parts per million by volume (ppmv) as NO_2 at 15% O_2 on one hour average basis except during startups and shutdowns. Each CTG will also be equipped with an oxidation catalyst to control carbon monoxides (CO) and volatile organic compounds (VOC) emissions. CO emissions will be controlled to 6 parts per million by volume (ppmv) corrected to 15% O_2, averaged on one hour basis, VOC emissions will be guaranteed at 2 ppmv (as methane) corrected to 15%, except during startups and shutdowns.

The CTGs emissions will exhaust through 80-foot tall stacks with tip diameters of 12.5 feet, with exhaust temperature between 818° F and 845° F.

A wet cooling tower is used for cooling the air inlet chiller system. Heat rejection from the turbine compressors and the lube oil system is air cooled. The plant will use fresh and reclaimed water obtained from the Fallbrook Public Utilities District via truck transport. Sanitary wastewater will be managed with an onsite septic system. Process wastewater from the plant will be recycled onsite using a reverse osmosis (RO) water treatment system. A few hundred gallons of wastewater will not be recycled on site per month and will need to be trucked offsite for treatment at a licensed facility.

Each combustion turbine exhaust will be equipped with a Continuous Emission Monitoring System (CEMS) for NOx, CO, and O_2, together with a data acquisition system and the remote data collection node to generate a log of emissions data for compliance documentation.

As a peaking power generating plant, OGP actual operation levels are influenced by the unpredictable events such as system outages, unexpected demand. The requested maximum allowable emissions are based on a maximum of 3,200 turbine operating hours per year for each turbine (6,400 hours per year for both turbines). The basic operational modes primarily affecting emissions are startups, shutdowns, and normal operations. The applicant has provided performance data based on vendor guarantees for the estimated emission rate for each criteria pollutant when operating under different modes. The expected maximum controlled emissions used in various aspects of the evaluation are presented in Tables 1a, 1b, 1c, and 1d.

Startup is defined as the 30 minute time period starting when fuel flow begins. Shutdown is defined as the 15 minute period preceeding the moment at which fuel flow ceases. Emissions during startups and shutdown are higher than during steady state operation. Startup and shutdown emissions are based on 3 startups and 3 shutdowns per day and 250 startups and 250 shutdowns per year.

IV. EMISSION CALCULATIONS

Emissions from Combustion Turbine Generators

Project emissions of NOx, CO, SOx, VOC and PM10 were estimated based on data supplied by turbine manufacturer and emission limits on permit conditions.

For startup, warmup and shutdown, emission rates are provided by turbine manufacturer.

For steady state operations, emission rates for NOx, CO and VOC are calculated based on emission concentration limits (in ppmv at 15%O2) on permit conditions and exhaust flow rates at average ambient temperature, as follows:

Emissions, lbs/hour = (concentration, ppmv) x (exhaust flow rate, dscfh) x (molecular weight/molar volume).

Emissions of SOx are calculated based on heat input in MMBtu/hour and SOx emission factor of 0.0021 lbs/MMBtu, which was derived from the maximum allowable sulfur content of 0.75 grains per 100 standard cubic feet. Emission of PM10 are calculated based on vendor supplied guaranteed emission rate. Table 1a presents all the emission rates.

Table 1a – Turbine Emission Rates for Different Operating Modes

Pollutant	Startup Lbs/event (10 minutes)	Warm Up Lbs/event (30 minutes)	Shut Down, Lbs/event (8 minutes)	Steady State, Lbs/hour
NOx	3	10.9	2.2	4.3
CO	5.6	7.5	3.7	6.1
VOC	1.1	1.1	0.6	1.3
PM10	0.67	1.5	0.53	3
SOx	0.14	0.41	0.11	1

Turbine Maximum Hourly Emissions:

Maximum hourly emissions for each turbine, as presented in Table 1b, are estimated based on an hour when startup, warm up, and steady state operation all taken place.

Table 1b – Single Turbine Maximum Hourly Emissions						
Operating Mode	Time Duration	Hourly Emissions, Lbs/hour				
		NOx	CO	VOC	PM10	SOx
Startup	10 minutes/hour	3	5.6	1.1	0.5	0.2
Warm up	30 minutes/hour	10.9	7.5	1.1	1.5	0.5
Steady state	20 minutes/hour	1.4	2.0	0.4	1.00	0.3
Total		15.4	15.1	2.6	3	1

Turbine Maximum Daily Emissions:

Maximum daily emissions for each turbine are estimated based on a day with 3 startups (which include startups and warm ups), 3 shutdowns and the rest at steady state operation. Table 1c presents each turbine maximum daily emissions

Table 1c – Single Turbine Maximum Daily Emissions							
Operating Mode	Time Duration Per Event, Minutes/event	Daily Time Duration, Hours/day	Daily Emissions, lbs/day				
			NOx	CO	VOC	PM10	SOx
Startup	10	0.5	9	16.8	3.3	2.01	0.42
Warm Up	30	1.5	32.7	22.5	3.3	4.5	1.23
Shut down	8	0.4	6.6	11.1	1.8	1.2	0.4
Steady State	1296	21.6	92.9	131.8	28.1	64.8	21.6
Total		24	141.2	182.2	36.5	72.9	23.6

Turbine Maximum Annual Emissions

Maximum annual emissions for each turbine as presented in Table 1d were estimated based on 250 startups (which includes startups and warm ups), 250 shutdowns and the rest at controlled steady state operation for a total of 3200 hours per turbine.

Table 1d – Single Turbine Maximum Annual Emissions						
Operating Mode	Time Duration , Hours/year	Annual Emissions, tons/year				
		NOx	CO	VOC	PM10	SOx
Startup	41.7	0.4	0.7	0.1	0.1	0.02
Warm Up	125	1.4	0.9	0.1	0.2	0.1
Shut down	33.3	0.3	0.5	0.08	0.07	0.014
Steady State	3000	6.5	9.2	2.0	4.5	1.5
Total	3200	8.6	11.3	2.3	4.9	1.6

Emissions from Black Start Engine and Emergency Fire Pump Engine

The black start engine is used to facilitate the combustion turbine generator startups during power outages. The engine is fueled with natural gas and is equipped with catalytic converter. Daily emissions from the black start engine are based on 0.5 operating hour. Annual emissions are based on 52 hours per year. Table 2a presents emissions from the black start engine.

Table 2a – Black Start Engine Emissions			
Pollutant	lbs/hour	lbs/day	tons/year
NOx	3.2	1.6	0.08
CO	4.3	2.1	0.1
VOC	0.7	0.4	0.02
PM10	0.07	0.04	0.002
SOx	0.02	0.01	0.0004

The diesel emergency fire pump engine must comply with Tier 2 emission standards for EPA certified engines of model year 2004. Daily emissions are based on 0.5 operating hour per day, annual emissions are based on 50 hours per year. Table 2b presents the fire pump engine emissions.

Table 2b – Emergency Fire Pump Engine Emissions			
Pollutant	lbs/hour	lbs/day	tons/year
NOx	3.2	1.6	0.08
CO	0.6	0.3	0.015
VOC	0.6	0.3	0.08
PM10	0.08	0.04	0.002
SOx	0.2	0.08	0.004

Cooling Tower Emissions

The cooling tower is a source of PM10 emissions. One cooling tower, consisting of 3 cells, will be used for process cooling at the OGP. The tower will circulate 8,500 gallons per minute of water. The maximum blowdown quantity will be 4,594 ppm total dissolved solids (TDS). Particulate emission from the cooling tower is estimated based on the water TDS, the drift loss of circulating water of 0.085 gal/min (drift fraction of 0.00001), and water density of 8.34 lbs/gal.

PM10 (lbs/hr) = (TDS concentration) x (drift loss of circulating water) x (density of water)
= (4,594 / 1E6) x (8,500 gal/min)(60 min/1 hour) x (8.34lb/gal water)x (0.00001)
= 0.2 lbs/hour

PM10 (lbs/day) = 0.2 lbs/hr x 24 hrs/day
= 4.69 lbs/day

PM10 (tons/year) = 0.2 lbs/hr x 3,200 hrs/yr / 2,000 lbs/ton = 0.32 tons/year

On- Site Paved Road Fugitive Dust Emissions

The delivery of fresh water and reclaimed water from Fallbrook Public Utility District (FPUD) to the OGP results in on-site fugitive dust emissions. PM10 emission factor for the fugitive dust emissions from on-site paved road are calculated based on the following equation:

$E = k\ (sL/2)^{0.65}\ (W/3)^{1.5}$ - C, where:

E = particulate emission factor (lbs/VMT)

K = particle size multiplier (0.016 lbs/VMT for PM10)

sL = road surface silt loading (0.037 for OGP paved road)

W = average weight of vehicles traveling the road (30 tons for water trucks traveled to OGP)

C = emission factor for 1980's vehicle fleet exhaust, brake and tire wear (0.00047 lb/VMT for PM10)

$E = (0.016) \times (0.037/2)^{0.65} \times (30/3)^{1.5} - 0.00047$

$= 0.0374$ lb/VMT

Table 2c presents on-site paved road fugitive PM10 emissions from water trucks based on 0.25 miles traveled on site by each reclaimed water truck and 0.25 miles traveled on site by each fresh water trucks.

Table 2c – On-Site Paved Road Fugitive Emissions from Water Delivery Trucks

Vehicle Type	Number of trips			Emission Factor, lbs/trip	Fugitive PM10 Emissions		
	Hourly	Daily	Annual		Hourly, Lbs/hour	Daily, Lbs/day	Annual, Tons/year
Reclaimed Water Trucks	1	24	3200	0.009	0.009	0.224	0.015
Fresh Water Trucks	1	24	3200	0.009	0.009	0.224	0.015
Total					0.019	0.449	0.030

Project Emissions Summary

Maximum project total emissions are based on total emissions from both turbines, from the black start engine, the emergency diesel fire pump engine, particulate emission from the cooling tower, and on-site

paved road fugitive particulate emissions from water delivery trucks. Table 3a presents the project total hourly emissions.

Table 3a – Project Hourly Emissions

Equipment	Emission, lbs/hour				
	NOx	CO	VOC	PM10	SOx
Two Turbines	30.7	30.3	5.3	6.0	2.0
Black Start Engine	3.2	4.3	0.7	0.07	0.02
Emergency Fire Pump Engine	3.2	0.6	3.2	0.08	0.2
Cooling Tower				0.2	
On-site Fugitive Paved Road				0.02	
Total	37.1	35.1	9.1	6.4	2.2

Table 3b presents the total project daily emissions

Table 3b – Project Daily Emissions

Equipment	Emissions, Lbs/day				
	NOx	CO	VOC	PM10	SOx
Two Turbines	282.4	364.4	73	145.8	47.2
Black Start Engine	3.2	4.3	0.7	0.07	0.02
Emergency Fire Pump Engine	3.2	0.6	3.2	0.08	0.2
Cooling Tower				4.7	
On-Site Fugitive Paved Road				0.45	
Total	288.8	369.2	76.9	151.1	47.4

Table 3c presents the total project annual emissions

Table 3c –Project Annual Emissions					
Equipment	Emissions, tons/year				
	NOx	CO	VOC	PM10	SOx
Two Turbines	17.2	22.6	4.6	9.8	3.2
Black Start Engine	0.08	0.1	0.02	0.002	0.0004
Emergency Fire Pump Engine	0.08	0.02	0.08	0.002	0.004
Cooling Tower				0.3	
On-Site Fugitive Paved Road				0.03	
Total	17.4	22.7	4.7	10.1	3.2

Commissioning Period

Commissioning is the time period during which the newly installed turbines undergo shakedown testing and tuning to ensure that the equipment is working properly and will be able to comply with all the proposed emission limits. Commissioning consists of different testing periods: first fire, when each unit is operated at minimum idle to full speed with no emission control, at no load and not tied to the grid; synchronization, when the unit is tied to the grid and operated at low load with no water injection and no SCR in operation; low load to full load operation with water injection and no SCR in operation, low load to full load operation with water injection and SCR commissioned and tuned; power augmentation when all equipment are commissioned and tuned. Only one turbine will be in commissioning mode at a time. While one turbine is in commissioning mode, the other turbine could be in normal operation. Each turbine is expected to operate about 60 hours during this commissioning period. However, a limit of 200 commissioning hours is granted for each turbine to account for any potential longer testing requirement. During the commissioning period, the black start engine is conservatively expected to operate for about 26 hours and the fire pump engine is conservatively expected to operate for about 25 hours. Maximum hourly emissions during commissioning are based on the combined hourly emissions from one turbine in commissioning mode, the other turbine in startup mode of normal operation, the black start engine in testing operation for half an hour and the fire pump engine in testing operation for half an hour. Table 4a presents the commissioning maximum hourly emission rates.

Table 4a – Maximum Hourly Emissions During Commissioning			
Pollutants	Turbines Emissions, lbs/hour	Black Start Engine and Fire Pump Engine Emissions, lbs/hour	Total Commissioning Hourly Emissions, lbs/hour
NOx	65.4	3.2	68.6
CO	59	2.45	61.5
VOC	6.3	0.65	6.95
SOx	2	0.11	2.11
PM	6	0.075	6.1

To estimate daily and annual total commissioning emissions, emission rates for each commissioning phase are derived based on averaging emissions from all potential commissioning phases, as presented in Table 4b

Table 4b – Emission Rates for Different Turbine Commissioning Phases					
Commissioning Phase	Emission, lbs/hour				
	NOx	CO	VOC	PM	SOx
First fire – No load – No water Injection – No SCR	30.2	5.4	0.4	3	1
Synchronization- Low load-No Water Injection – No SCR	30.1	5.4	0.4	3	1
Low load-Water Injection – No SCR	20.6	12.6	0.6	3	1
Low load – Water injection - SCR	2.1	4.4	0.6	3	1
Full load – Water Injection - SCR	4.4	15.4	1.2	3	1

Table 4c presents maximum daily commissioning emissions from each turbine during each commissioning phase, based on the projected number of hours per day each turbine to go through specific commissioning phase

Table 4c – Single Turbine Daily Commissioning Emissions						
Commissioning Mode	Daily hours	Emission, lbs/day				
		NOx	CO	VOC	PM10	SOx
First fire – Uncontrolled	12	364.2	64.8	4.8	36	12
Synchronization - Uncontrolled	12	361.2	64.8	4.8	36	12
Low load-water injection – No SCR	12	247.2	151.2	7.2	36	12
Low load – water injection - SCR	12	25.2	52.8	7.2	36	12
Full load – water injection - SCR	12	52.8	184.8	14.4	36	12

Table 4d presents the project maximum daily emissions during commissioning, which include maximum daily commissioning emissions from one turbine, daily emissions from the other turbine in normal operation, daily emissions from the black start engine for half an hour testing operation and daily emissions the fire pump engine for half an hour testing operation.

Table 4d – Total Project Daily Commissioning Emissions				
Pollutant	Turbine in Commissioning, lbs/day	Turbine in Normal Operation lbs/day	Black Start Engine & Fire Pump Engine, lbs/day	Project Daily Commissioning Emissions, lbs/day
NOx	364.2	141.2	3.2	508.6
CO	184.8	182.2	2.4	369.4
VOC	14.4	36.5	0.7	51.6
PM10	36	72.9	0.08	108.98
SOx	12	23.6	0.09	35.69

Total commissioning emissions for each turbine are estimated based on a total of 200 commissioning hours, as presented in Table 4e.

Table 4e – Single Turbine Total Commissioning Emissions						
Commissioning Mode	Projected Hours	Emission, lbs/year				
		NOx	CO	VOC	PM10	SOx
First fire – Uncontrolled	40	1,208	216	16	120	40
Synchronization - Uncontrolled	80	2,408	432	32	240	80
Low load-water injection – No SCR	20	412	251	12	60	20
Low load – water injection - SCR	20	42	88	12	60	20
Full load – water injection - SCR	40	176	616	48	120	40
Total	200	4,246	1,604	120	600	200

Table 4f presents the project total commissioning emissions, which include commissioning emissions from 200 hours for each turbine, emissions from the black start engine for 26 hours and emissions from the fire pump engine for 25 hours.

Table 4f – Total Project Commissioning Emissions				
Pollutant	One Turbine, tons/year	Both Turbines, tons/year	Black Start Engine & Fire Pump Engine, tons/year	Project Commissioning Emissions, tons/yr
NOx	2.1	4.2	0.08	4.28
CO	0.8	1.6	0.058	1.66
VOC	0.06	0.12	0.05	0.15
PM10	0.3	0.6	0.002	0.502
SOx	0.1	0.2	0.0022	0.202

For the turbines first year operation during which both commissioning operation and normal operation take place, total project emissions include emissions from commissioning of two turbines, emissions from normal operation for both turbines which include 250 startups, 250 shutdowns and 2,800 hours of normal operation for each turbine, emissions from the black

start engine for 52 hours, emissions from the emergency fire pump engine for 50 hours, emissions from the cooling tower and paved road fugitive dust emissions. Table 4d presents the project total annual emissions for year with commissioning.

Table 4f– Total Project Emissions During Year With Commissioning			
Pollutants	Commissioning Emissions, tons/year	Normal Operation Emissions, tons/year	Total Annual Emissions, tons/year
NOx	4.2	16.4	20.6
CO	1.6	21.5	23.1
VOC	0.1	4.2	4.3
PM10	0.6	9.5	10.1
SOx	0.2	3.1	3.3

V. RULES ANALYSIS

Rule 20.1(c)(35) – Major Stationary Source

Rule 20.1(c)(35) defines major stationary source as any emission units or stationary source which has, or will have after issuance of a permit, an aggregate potential to emit one or more air contaminants, including fugitive emissions, in amounts equal to or greater than 100 tons per year of PM10, 50 tons per year of NOx, 50 tons per year of VOC, 100 tons per year of SOx, 100 tons per year of CO, 100 tons per year of Lead. The aggregate potential to emit of all criteria pollutants, including fugitive emissions, from the OGP are less than the major stationary source threshold limits. Therefore, OGP is not a major stationary source.

Rule 20.2(d)(1)(i)- Best Available Control Technology(BACT)

Rule 20.2(d)(1)(i) requires any new or modified emission unit which has any increase in its potential to emit and which has a post-project potential to emit of 10 lbs per day or more of particulate matter (PM), NOx, VOC, SOx to be equipped with Best Available Control Technology (BACT) for each such air contaminant. Based on emission estimates, the OGP combustion turbines trigger BACT for NOx, VOC, SOx, and PM_{10}.

A search through EPA/ARB BACT Clearinghouse and other Districts BACT Guidance documents show that 2.5 ppmvd NOx at 15% oxygen averaged over 1 hour is considered the current most stringent NOx emission limit that has been achieved in practice for simple cycle combustion turbines, therefore, it is considered BACT for NOx. This combustion gas turbine is equipped with water injection and selective catalytic reduction (SCR), which will help achieve 2.5 ppmvd NOx averaged over 1 hour. For VOC, emission limit of 2 ppmvd at 15% oxygen averaged over 1 hour is considered the most stringent that has been achieved in practice, therefore, it is considered BACT for VOC for simple-cycled combustion gas turbine. The proposed turbine is guaranteed by the manufacturer to achieve 2 ppmv VOC at 15% oxygen. Initial source testing and annual source testing will be used to confirm compliance with these BACT emission limits. For Particulate Matter (PM_{10}), good combustion practice and a limit in ammonia slip emission concentration of 5 ppmv at 15% oxygen are considered BACT. For Oxides of Sulfur (SOx), BACT is the use of natural gas that contains less than 1 grain of sulfur compounds per 100 standard cubic feet of natural gas. Public Utility Commission (PUC) quality natural gas sold in San Diego County is required to meet a maximum sulfur content limit of 0.75 grains of sulfur compounds per 100 standard cubic feet of natural gas. Therefore, use of PUC quality natural gas meeting this 0.75 grains limit is recommended as BACT. The applicant will be required to maintain documents showing the sulfur content of natural gas used. Any alternative supplies of natural gas must be approved by the District and meet this sulfur content limit.

Rule 20.2(d)(2)(iii) – Air Quality Impact Analysis (AQIA):

Rule 20.2 (d)(2)(iii) requires that for any project which results in an emissions increase equal to or greater than any of the amounts listed in below, the applicant shall demonstrate to the satisfaction of the Air Pollution Control Officer through an AQIA that the project will not cause a violation of a state or national ambient air quality standard anywhere that does not already exceed such standard, nor cause additional violations of a national ambient air quality standard anywhere the standard is already being exceeded, nor cause additional violations of a state ambient air quality standard anywhere the standard is already being exceeded, except as provided for in Subsection (d)(2)(v), nor prevent or interfere with the attainment or maintenance of any state or national ambient air quality standard.

Particulate Matter (PM): 100 lbs/day, 15 tpy

NOx: 25 lbs/hour, 250 lbs/day, 40 tpy

SOx: 25 lbs/hour, 250 lbs/day, 40 tpy

CO: 100 lbs/hour, 550 lbs/day, 100 tpy

Lead and lead compounds: 3.2 lbs/day, 0.6 tpy

Total hourly and daily emissions of NOx and daily emissions of PM10 from this OGP during normal operation, which include emissions from two combustion turbines of Applications 985708 and 985711, and two emergency standby engines of Applications 985709 and 985710 trigger AQIA requirements. Total hourly and daily emissions of NOx during commissioning period for both combustion turbines also trigger AQIA requirements. Air Quality Impact Analyses were performed for the project total emissions during normal operation and commissioning period to determine if the proposed project by itself contributes to an exceedance of the National Ambient Air Quality Standards, State Ambient Air Quality Standard. The analyses show no violation of any Ambient Air Quality Standard. The analyses can be reviewed in the Appendix A of this determination.

Rule 20.2 (d)(3)-Prevention of Significant Deterioration (PSD)

Rule 20.2 (d)(3) states that the District shall not issue an Authority to Construct or modified Permit to Operate for any project which will have a significant impact on a Class I Area or will have after issuance of a Permit, an aggregate potential to emit one or more air contaminants in amounts equal to or greater than 250 tons/year of PM10, NOx, VOC, SOx, CO. Combined emissions from this OGP, which includes emissions from two combustion turbines of Applications 985708 and 985711, and two emergency standby engines of Applications 985709 and 985710 do not trigger this requirement.

Rule 20.2(d)(3)(i) and (d)(4) – Public Notice and Comment:

Rule 20.2 (d)(4) requires a public notice and comment period for any applications which require an AQIA under Sections d(2) or d(3). Public Notice regarding this OGP will be published in the San Diego Daily Transcript for a 30-day public comment period. Notices regarding this evaluation will be sent to EPA, ARB, South Coast Air Quality Management

District, and the Imperial County Air Pollution Control District. A 30 day comment period will start as the notices are sent. The Air Pollution Control Officer will consider all comments submitted.

Rule 20.5 – Power Plants:

This rule requires that the District submit Preliminary and Final Determinations of Compliance reports to the California Energy Commission (CEC). The Final Determination of Compliance is equivalent to a District Authority to Construct.

Rule 50 – Visible Emissions:

This rule limits air contaminants emissions into the atmosphere of shade darker than Ringlemann 1 (20% opacity) to not more than an aggregate of three minutes in any consecutive sixty-minute period.

Based on the proposed equipment and the type of fuel to be used, no visible emissions at or above this level are expected during operation of the OGP.

Rule 51 – Nuisance:

This rule prohibits the discharge of air contaminants that cause or have a tendency to cause injury, nuisance, annoyance to people and/or the public or damage to any business or property.

Based on the proposed equipment and the type of fuel to be used, no nuisance or complaints are expected from this OGP.

Rule 53 – Specific Air Contaminants:

This rule limits emissions of sulfur compounds (calculated as SO_2) to less than or equal to 0.05% by volume, on a dry basis. The rule also limits particulate matter emissions from gaseous fuel combustion to less than or equal 0.1 grains per dry standard cubic foot of exhaust calculated at 12% CO_2.

Sulfur Compounds

The applicant proposes to use Public Utilities Commission (PUC) quality natural gas sold in San Diego County. Because of the low sulfur content of the fuel, the plant is expected to comply with the sulfur emission requirements of Rule 53. The fuel is expected to have a sulfur content less than 0.75 grains per 100 dry standard cubic foot (gr/dscf).

Particulates

Assuming an F-Factor of 198.025 standard cubic feet of exhaust per pound of fuel combusted @ 12% CO_2, a maximum natural gas usage of 21,263 lbs /hr, and an estimated maximum particulate matter emission rate of 3 lbs/hr, combustion particulate at maximum load are estimated to be:

Grain loading = [(3 lbs/hr)(7,000 gr/lb)] / (198.025 scft/lb fuel)(21,263 lbs fuel/hr)) = 0.002 gr/dscf

This is well below the Rule 53 emission limit of 0.1 gr/dscf. Therefore the turbine is expected to comply with this rule.

For the natural gas black start engine, the grain loading is estimated to be:

Grain loading = [(0.07 lbs/hr)(7,000 gr/lb)] / (198.025 scft/lb fuel)(321.9 lbs fuel/hr)) = 0.008 gr/dscf

The black start engine is in compliance with this rule requirement.

Rule 68 –Oxides of Nitrogen from Fuel Burning Equipment:

This rule limits NOx emissions from any fuel burning equipment to less than 125 ppmv calculated at 3% oxygen on a dry basis. However, since this equipment is subject to the more stringent requirements of Rule 69.3.1, the equipment is exempt from Rule 68.

Rule 69.3-Stationary Gas Turbines – Reasonably Available Control Technology:

This rule limits NOx emissions from gas turbines greater than 0.3 MW to 42 ppm at 15% oxygen when fired on natural gas. The rule also specifies monitoring and record keeping requirements. Startups, shutdowns, and fuel changes are defined by the rule and excluded from compliance with these limits.

The proposed turbines for this project will be equipped with water injection and SCRfor control of NOx. Emissions are required to be far below 42 ppm. Compliance with this rule is expected.

Rule 69.3.1 – Stationary Gas Turbines – Best Available Retrofit Control Technology:

This rule limits NOx emissions from gas turbines greater than 10 MW to 15x(E/25) ppm when operating uncontrolled and 9 x (E/25) ppm at 15% oxygen when operating with controls and averaged over a 1-hour period. E is the thermal efficiency of the unit. The rule also specifies monitoring and record keeping requirements. Startups, shutdowns are defined by the rule and excluded from compliance with these limits.

The thermal efficiency for this combustion turbine is approximately 37 %. Therefore the maximum allowable uncontrolled NOx concentration is 22.2 ppmv based on 1-hr averaging period at 15% oxygen and the maximum allowable controlled NOx concentration is 13.3 ppmvd. The proposed turbines for this project will be equipped with water injection and SCR controls for NOx. Emissions are expected to be far below 13.3 ppmvd. Compliance with this rule is expected.

Emissions above these levels during the commissioning period could occur during shakedown and testing of the turbines and control equipment. Emission excursions above these levels during the commissioning period are authorized for up to 200 hours. Authority to Construct conditions will limit commissioning operation to less than 200 hours. Once the control equipment has been installed and commissioned, this equipment is expected to comply with these limits.

Rule 69.4.1: Stationary Reciprocating Internal Combustion Engines – Best Available Retrofit Control Technologies.

Rule 69.4.1 (d)(1) and San Diego APCD permitting policy require both natural gas fueled and diesel fueled emergency standby engines to meet NOx emission standard of 6.9 g/bhp-hr. The

natural gas fueled black start engine has NOx emission at 1.5 g/bhp-hr; the emergency fire pump engine has NOx emission at 3.84 g/bhp-hr.

Rule 69.4.1(d)(2) requires all engines subject to this rule to meet CO emission standard of 4500 ppmv at 15% oxygen. The black start engine has CO emission at 314 ppmv at 15% O2. The fire pump engine has CO emissions at 106.8 ppmv @15% oxygen.

Rule 69.4.1(d)(3) requires all rich burn engines subject to this rule to meet VOC emission standard of 250 ppmv at 15% oxygen. The black start engine has VOC emission at 38 ppmv at 15% O2.

Rule 69.4.1(d)(4) requires diesel engines to use only California Diesel fuel. Use of CARB diesel fuel is specified on permit conditions.

Rule 69.4.1(e)(3) requires installation of non-resettable totalizing meter or non-resettable hour meter. Both engines have hour meters.

Rule 69.4.1 requires engine operators to conduct periodic maintenance of the engine and its control system in accordance with a procedure recommended by the manufacturer or approved by the District. This requirement is included in the engines permit conditions.

Rule 69.4.1(g)(1)(v), (vi) requires the engine operator to keep records of California Diesel fuel certification and engine maintenance procedure. Compliance with this requirement is verified through recordkeeping.

Rule 69.4.1(g)(2) requires the engine operator to maintain an operating log of the dates and times of engine operation, of the total cumulative hours of operation per calendar year, and of engine periodic maintenance. Compliance with this requirement is verified through recordkeeping.

Rule 69.4.1(g)(6) requires all records to be kept on site for at least three years and made available to the District upon request. Compliance with this requirement is verified through recordkeeping.

Rule 69.4.1(i)(1) exempts emergency standby engines from periodic source testing.

Rule 1200 - Toxic New Source Review

Rule 1200 New Source Review for Toxic Air Contaminants requires that a Health Risk Assessment (HRA) be performed if the emissions of toxic air contaminants will increase. A detailed HRA is necessary if toxics emissions exceed District de minimis levels. Toxic Best Available Control Technology (TBACT) must be installed if the HRA shows a cancer risk greater than one in a million. Additional requirements apply if the cancer risk is expected to exceed ten in a million.

An HRA was performed using EPA AP-42 emission factors and California Air Toxics Emission Factors (CATEF) for toxic air contaminant emissions from the project, which include the two combustion turbines, the black start engine and the emergency fire pump engine. The health risk was determined to be less than one in a million at all the receptors located beyond the plant boundary. The heath risk analysis of this project is discussed in Appendix B of this document.

The applicant also addressed potential air toxic emissions associated with the use of reclaimed water in the cooling tower. The applicant identifies the compounds that will occur in the water; treatment of this water to meet standards for discharge, and further treatment of the water for pH balance, biocide, scale and corrosion control; cooling tower drift eliminator. After review, the District has determined that toxic air contaminant emissions from the cooling tower will not cause a significant health risk, and will not cause overall project risks to be above 1 in a million.

Regulation XIV – Title V Operating Permits

Rule 1401 of District Regulation XIV on Title V Operating Permit includes any emission source subject to the acid rain provisions of Title IV of the Federal Clean Air Act as being subject to the Title V Operating Permit program. This combustion turbine is subject to the acid rain provision, therefore, a Title V application will be submitted to the District for evaluation.

NESHAPS (National Emissions Standards for Hazardous Air Pollutants)

40 CFR Part 63 Subpart YYYY – National Emissions Standards for Hazardous Air Pollutants for Stationary Combustion Turbines

This subpart establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emissions from stationary combustion turbines located at major sources of HAP emissions, and requirements to demonstrate initial and continuous compliance with the emissions and operating limitations. This project is not subject to the requirements of NESHAP since the site is not a major source of HAPs.

ATCM (Airborne Toxic Control Measures)

The emergency diesel fire pump engine is subject to the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines.

Section § 93115.5 (a)(1) requires that by January 1, 2006, no owner or operator of a new stationary CI engine shall fuel the engine with any fuel unless the fuel is one of the following: CARB Diesel Fuel; or an alternative diesel fuel that meets the requirements of the Verification Procedure; or an alternative fuel; or CARB Diesel Fuel used with fuel additives that meets the requirements of the Verification Procedure; or any combination of the above fuels. This engine is required to use only CARB Diesel Fuel.

Section § 93115.6(a)(1) requires that no owner or operator shall operate a new stationary emergency standby diesel-fueled CI engine for non-emergency use, including maintenance and testing, during the following periods: whenever there is a school sponsored activity, if the engine is located on school grounds; and between 7:30 am and 3:30 pm on days when school

is in session' if the engine is located within 500 feet of school grounds. Compliance is required through permit conditions.

Section § 93115.6(a)(3)(A)(1) requires that new stationary emergency standby diesel-fueled engines (>50 bhp) shall emit diesel PM at a rate less than or equal to 0.15 g/bhp-hr; or meet the current model year PM standards specified in the Off-Road Compression Ignition Engine Standards for off-road engines with the same maximum rated power (title 13 CCR, section 2423), whichever is more stringent; and not operate more than 50 hours per year for maintenance and testing purposes. This engine PM emission rate is 0.09 g/bhp-hr. The engine is limited to 50 hours per year for testing and maintenance operation.

Section § 93115.6(a)(3)(B) requires that new stationary emergency standby diesel-fueled engines (>50 bhp) meet the HC, NOx, NMHC+NOx, and CO standards for off-road engines of the same model year and maximum rated power as specified in the Off-Road Compression-Ignition Engine Standards (title 13, CCR, section 2423). If no standards have been established for an off-road engine of the same model year and maximum rated power as the new stationary emergency standby diesel-fueled CI engine, then the new stationary emergency standby diesel-fueled CI engine shall meet the Tier 1 standards in title 13, section 2423 for an off-road engine of the same maximum rated power, irrespective of the new stationary emergency standby diesel-fueled CI engine's model year. This engine meets the Tier 2 HC, NOx, NMHC + NOx and CO standards for off-road engine of the 2004 model year.

Section § 93115.10(a) requires each owner or operator of new and in-use stationary CI engines, including non-diesel-fueled CI engines, to submit to the District APCO information on: owner/operator contact information; engine information; fuel used; operation information; receptor information; and whether the engine in included in an existing AB2588 emission inventory. The District may exempt the owner or operator from providing all or part of this information if there is a current record of the information in the owner or operator's permit to operate, permit application, or District records. This information has been provided by applicant in application for permit to operate.

Section § 93115.10(e)requires that a non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed upon engine installation, or by no later than January 1, 2005, on all engines subject to all or part of the emission standards requirements, unless the District determines on a case-by-case basis that a non-resettable hour meter with a different minimum display capability is appropriate in consideration of the historical use of the engine and the owner or operator's compliance history. This engine has an hour meter.

Section § 93115.10(g)(1) requires each owner or operator of an emergency standby diesel-fueled CI engine to keep records and prepare a monthly summary that lists and documents the nature of use for emergency use hours, maintenance and testing hours, initial start-up testing hours, and records of fuel type. Compliance is required through permit conditions

Section § 93115.10(g)(2) requires all records to be retained for a minimum of 36 months. Records for the prior 24 months shall be retained on-site, and made immediately available to District staff upon request. Records for the prior 25 to 36 months shall be made available to District staff within 5 working days from request. Compliance is required through permit conditions

Section § 93115.13 requires that upon approval by the District APCO, the following sources of data may be used in whole or in part to meet the emission data requirements:

A. Off road engine certification test data for the stationary diesel-fueled CI engine.
B. Engine manufacturer test data.
C. Emission test data from a similar engine, or
D. Emission test data used in meeting the requirements of the Verification Procedure for the emission control strategy implemented.

Engine manufacturer emission data were used to verify compliance with emission standard requirements.

New Source Performance Standards (NSPS)

40 CFR Part 60- Subpart KKKK- National Standards of Performance for New Stationary Combustion Turbines. This new source performance standard requires stationary combustion

turbines with a heat input equal to or greater than 10 MMBtu/hour based on the high heating value of the fuel to comply with NOx and SO2 emission standards. Although the San Diego Air Pollution Control District has not yet been delegated the authority to enforce this subpart, compliance with the performance standards is expected.

§60.4320 requires new combustion turbines firing natural gas with a heat input rate between 50 MMBtu/hour and 850 MMBtu/hour to comply with NOx standard of 25 ppm at 15% O2 for any 4-hour rolling average or any 30-day rolling average. The proposed combustion turbine is guaranteed to meet 25 ppmv of NOx at 15% O2. With SCR as post-combustion emission control, NOx emission from this combustion turbine is controlled to 2.5 ppm at 15% O2. Emissions during startup and shutdown are also expected to comply with 25 ppmv at 15% O2.

§60.4330 prohibits sulfur dioxide emissions from combustion turbine in excess of 0.90 lbs/MW-hour gross output or 0.060 lbs/MMBtu heat input. SO2 emission from the proposed combustion turbine is 0.002 lbs/MMBtu.

§60.4335 requires turbine using water injection to install, certify, maintain and operate a continuous emission monitoring system (CEMs) consisting of a NOx monitor and a diluent gas (oxygen) or carbon dioxide monitor to determine the hourly NOx emission rate in parts per million or pounds per MMBtu. Turbines complying with intput- based standards shall install calibrate, maintain and operate a fuel flow meter to measure heat input. Turbines complying with output-based standards shall install, calibrate, maintain and operate a watt meter to measure the gross electrical output in megawatt-hours. The proposed combustion turbine is equipped with a CEM system to monitor NOx and CO emissions in parts per million and oxygen content in the exhaust gas.

§60.4345 requires the CEM system to be installed and certified according to Performance Specification 2 in Appendix B to this part, or according to Appendix A of part 75 of this chapter. Each fuel meter and watt meter shall be installed, calibrated, maintained and operated according to the manufacturer's instructions. The turbine operator shall develop and keep on

site a QA plan for all continuous monitoring equipment. The CEM system for this combustion turbine is required to go through Relative Accuracy Test Audit (RATA) and all other required certification tests in accordance with 40 CFR Part 75 Appendix A and B. Continuous monitoring equipment are required to be installed, calibrated, maintained and operated according to manufacturer's recommendations in a protocol approved by the District and maintained on site.

§ 60.4355 requires turbine operator to develop and keep on site a parameter monitoring plan which explain the procedures used to document proper operation of the NOx emission controls. The plan shall include the indicators to be monitored and show there is significant relationship to emissions and proper operation of the NOx emission controls. The plan shall pick ranges of the indicators or describe the process by which such range will be established. The plan shall describe the frequency of monitoring and the data collection procedures. The proposed turbines are required to have continuous monitors to measure fuel flow rate, heat input rate, power output, exhaust gas flow rate, exhaust temperature, which are all operating parameters relating to NOx emissions. The monitors are installed, calibrated and maintained in accordance with a protocol approved by the District.

§ 60.4365 exempts the requirement to monitor total sulfur content of the fuel if it can be demonstrated through a valid purchase contract , tariff sheet or transportation contract for the fuel that total sulfur content of natural gas used is 20 grains of sulfur or less per 100 standard cubic feet. Sulfur content of natural gas fuel used in this turbine is 0.75 grains per 100 cubic feet of gas. Quarterly records of natural gas sulfur content are to be kept on site to satisfy this requirement.

§ 60.4350 requires turbine operator to use data from the CEMs system to identify excess emissions in accordance with specific procedure. Requirements will be included in the Authority to Construct conditions.

§ 60.4375 requires submittal of reports of excess emissions and monitor downtime for all periods of unit operation, including startup, shutdown and malfunction. For turbine

undergoing annual performance tests, report of each performance test must be submitted by 60 days following completion of the test. Reports on the CEM system are to be submitted in accordance with Rule 19.2 requirements and CEM protocol approved by the district.

§60.4400 requires that initial performance test and annual NOx performance test be conducted in accordance with the outline methodologies. This combustion turbine is required to be source tested initially and annually to demonstrate compliance with NOx, CO, VOC, and ammonia emission standards. The source tests are to be conducted in accordance with the applicable EPA test methods and applicable requirements of 40 CFR 75 Appendix B.

40CFR Part 72- Subpart A – Acid Rain Program

This part establishes general provisions and operating permit program requirements for sources and units affected under the Acid Rain program, pursuant to Title IV of the Clean Air Act. The proposed combustion turbine is affected by this Acid Rain Program as a utility unit in accordance with Section 72.6(a).

40CFR Part 72- Subpart C – Acid Rain Permit Applications

This subpart requires any source with an affected unit to submit a complete Acid Rain permit application by the applicable deadline. Requirement for submittal of Acid Rain Program application will be included in the Authority to Construct for the proposed combustion turbine.

40CFR Part 73- Sulfur Dioxide Allowance System

This part establishes the requirements and procedures for the allocation of sulfur dioxide emission allowances; the tracking, holding and transfer of allowances; the deduction of allowances for purposes of compliance and for purposes of offsetting excess emissions pursuant to Parts 72; the sale of allowances through EPA-sponsored auctions and a direct sale; the application for allowances from the Conservation and Renewable Energy Reserve; and the application for allowances for desulphurization of fuel by small diesel refineries. Requirements from this part will be included in evaluation for the Acid Rain program application required by Part 72.

40CFR Part 75 – Continuous Emission Monitoring

This part established requirements for the monitoring, recordkeeping, and reporting of SO2, NOx, and CO2 emissions, volumetric flow, and opacity data from emission units under the Acid Rain Program. The regulations include general requirements for the installation, certification, operation, and maintenance of continuous emission or opacity monitoring systems, certification tests and procedures, and quality assurance tests and procedures. Subpart B on Monitoring Provisions established general operating requirements for the monitoring systems. Subpart C establishes requirements on initial certification and recertification procedures. Subparts F and G establish requirements on recordkeeping and reporting requirements. All applicable requirements are included in the Authority to Construct conditions.

VI. ADDITIONAL ISSUES

After construction of the equipment has been completed, the applicant will be allowed a commissioning period of 200 hours for each turbine. During the initial startup, certain emissions standards must remain in effect. These include the aggregate emissions during commissioning period for the five criteria pollutants, the hourly mass emission limits for NOx and CO to ensure there will be no violation of any state or national ambient air quality standards. If the permanent CEMS are not functional at the time of initial startup, the applicant will be required to use a portable CEMS unit which has been calibrated to monitor initial startup of the turbines.

Once the emissions control equipment has been installed and is in good working order, the turbines must meet all BACT standards and permit requirements. CEMS and source testing will be used to show compliance with these standards.

CONCLUSIONS AND RECOMMENDATIONS

A Determination of Compliance confers the same rights and privileges as an Authority to Construct only when and if the California Energy Commission (CEC) approves the

Application For Certification, and the CEC certificate includes all conditions of the Determination of Compliance as proposed by the Air Pollution Control Officer.

If operated in accordance with the conditions specified in this Final Determination of Compliance, this equipment is expected to operate in compliance with all Rules and Regulations of the San Diego County Air Pollution Control District.

Cam Mi Nguyen
Project Engineer

12/4/08
Date

Senior Engineer Approval

12/4/08
Date

VII. PROPOSED AUTHORITY TO CONSTRUCT CONDITIONS

General Conditions

1. This equipment shall be properly maintained and kept in good operating condition at all times.

2. The applicant shall operate the project in accordance with all data and specifications submitted with the application.

3. The applicant shall provide access, facilities, utilities, and any necessary safety equipment for source testing and inspection upon request of the Air Pollution Control District.

4. The applicant shall obtain any necessary District permits for all ancillary combustion equipment including emergency engines, prior to on-site delivery of the equipment.

5. The exhaust stacks for the combustion turbine shall be at least 80 feet in height above site base elevation.

6. The unit shall be fired on Public Utility Commission (PUC) quality natural gas. The permitee shall maintain, on site, quarterly records of the natural gas sulfur content (grains of sulfur compounds per 100 dscf of natural gas) and the higher and lower heating values (btu/scf) of the natural gas; and provide records to District personnel upon request.

7. Pursuant to 40 CFR 72.30(b)(2)(ii) of the Federal Acid Rain Program, the applicant shall submit an application for a Title IV Operating Permit at least 24 months prior to commencement of operation.

8. The applicant shall submit an application to the District for a Federal (Title V) Operating Permit, in accordance with District Regulation XIV within 12 months after initial startup of this equipment.

9. The applicant shall comply with all applicable provisions of 40 CFR 73, including requirements to offset, hold and retire SO2 allowances.

10. The total combined unit operating hours for the combustion turbines of Permit No. 985708 and 985711 shall not exceed 6,400 hours per calendar year. Unit operating hour is defined in 40CFR 72.2. (NSR)

11. The total combined operation of the combustion turbines under startup and shutdown conditions shall not exceed 400 hours per year.

12. The permittee shall comply with the applicable requirements in 40 CFR Parts 60, 72, 73, and 75.

13. Power output (net MW) from each turbine generator of Permit No. 985708 and 985711 to the grid shall not exceed 49.8 MW. (NSR)

Emission limits

14. For purposes of determining compliance based on source testing, the average of three subtests shall be used. For purposes of determining compliance with emission limits based on the CEMS, data collected in accordance with the CEMS protocol shall be used and averaging periods shall be as specified herein.

15. For each emission limit expressed as pounds per hour or parts per million based on a one-hour averaging period, compliance shall be based on each rolling continuous one-hour period using continuous emission data collected at least once every 15 minutes.

16. During startup, the emissions from each turbine shall not exceed the following emission limits as determined by the continuous emission monitoring system (CEMs), continuous monitor and/or District-approved emission testing. Compliance with each limit shall be based on a 1-hour averaging period.

Pollutant	Limit, lbs/hour
Oxides of Nitrogen (NOx), calculated as NO2	15.4
Carbon Monoxide (CO)	15.1
Volatile Organic Compounds (VOC)	2.6

17. During shutdown, the emissions from each turbine shall not exceed the following emission limits as determined by the continuous emission monitoring system (CEMs), continuous monitor and/or District-approved emission testing. Compliance with each limit shall be based on a 1-hour averaging period

Pollutant	Limit, lbs/hour
Oxides of Nitrogen (NOx), calculated as NO2	5.9
Carbon Monoxide (CO)	9
Volatile Organic Compounds (VOC)	1.7

18. During an hour when both a startup and a shutdown occur, the emissions from each turbine shall not exceed the following emission limits as determined by the continuous emission monitoring system (CEMs), continuous monitor and/or District-approved emission testing. Compliance with each limit shall be based on a 1-hour averaging period

Pollutant	Limit, lbs/hour
Oxides of Nitrogen (NOx), calculated as NO2	16.1
Carbon Monoxide (CO)	16.8
Volatile Organic Compounds (VOC)	2.8

19. The emissions concentration of oxides of Nitrogen (NOx), calculated as nitrogen dioxide (NO2), shall not exceed 2.5 parts per million by volume on a dry basis (ppmvd) corrected to 15% oxygen and averaged over one hour period. Compliance with these limits shall be demonstrated continuously based on the CEMs data and at the time of the initial source test calculated as the average of three subtests. This limit shall not apply during the initial commissioning period or startup and shutdown periods as defined herein.

20. The emissions concentration of CO from the unit exhaust stack shall not exceed 6 parts per million by volume on a dry basis (ppmvd) corrected to15% oxygen and averaged over one hour period. Compliance with this limit shall be demonstrated at the time of the initial source test and continuously based on the CEMs data and based upon source testing calculated as the average of three subtests. This limit shall not apply during the initial commissioning period or startup and shutdown periods.

21. The VOC concentration, calculated as methane, measured in the exhaust stack, shall not exceed 2.0 ppmvd by volume corrected to 15% oxygen and averaged over each one-hour period. Compliance with this limit shall be demonstrated continuously based on source testing calculated as the average of three subtests. At the time of the initial compliance test, a District-approved CO/VOC surrogate relationship shall be established. The CO/VOC surrogate relationship shall be verified and/or modified, if necessary, based on annual source testing. This limit shall not apply during the commissioning period or during startup and shutdown conditions.

22. The emissions from each turbine shall not exceed the following emission limits, except during the initial commissioning period, startup and shutdown conditions, as determined by the continuous emission monitoring system (CEMs), continuous monitor and/or District-approved emission testing, calculated as the average of three subtests. Compliance with each limit shall be based on a 1-hour averaging period.

Pollutant	Limit, lbs/hour
Oxides of Nitrogen (NOx), calculated as NO2	4.3
Carbon Monoxide (CO)	6.1
Volatile Organic Compounds (VOC)	1.3

23. The emissions from each turbine shall not exceed the following emission limits, except during the initial commissioning period, as determined by the continuous emission monitoring system (CEMs), continuous monitor and/or District-approved emission testing, calculated as the average of three subtests. Compliance with each limit shall be based on a 1-hour averaging period.

Pollutant	Limit, lbs/day
Oxides of Nitrogen (NOx), calculated as NO2	141.2
Carbon Monoxide (CO)	182.2
Volatile Organic Compounds (VOC)	36.5

24. The emissions from each turbine shall not exceed the following emission limits, as determined by the continuous emission monitoring system (CEMs), continuous

monitor and/or District-approved emission testing, calculated as the average of three subtests. Compliance with each limit shall be based on a 1-hour averaging period.

Pollutant	Limit, tons/year
Oxides of Nitrogen (NOx), calculated as NO2	8.6
Carbon Monoxide (CO)	11.3
Volatile Organic Compounds (VOC)	2.3

25. Emissions of particulate matter 10 microns or less (PM10) shall not exceed 3.0 lbs per hour. Compliance with this limit shall be demonstrated based upon source testing calculated as the average of three subtests.

26. The discharge of particulate matter from the exhaust stack of each combustion turbine shall not exceed 0.10 grains per dry standard cubic foot. The District may require periodic testing to verify compliance with this standard.

27. Ammonia emissions from each turbine shall not exceed 5 parts per million volume on a dry basis (ppmvd) corrected to 15% oxygen. This limit shall not apply during the commissioning period or startup and shutdown periods Compliance with this limit shall be demonstrated through source testing calculated as the average of three subtests and utilizing one of the following procedures:
    a. Calculate daily ammonia emissions using the following equation:
    NH3 = ((a-(b * c/1,000,000)) * (1,000,000/b)) * d
    Where: a = ammonia injection rate (lbs/hour) / (17.0 lbs/lb-mole),
    b = exhaust flow rate at 15% oxygen / (29 lbs/lb-mole)
    c = change in measured NOx concentration (ppmvd @ 15% Oxygen) across the catalyst,
    d = ratio of measured ammonia slip to calculate ammonia slip as derived during compliance testing.
    b. Other calculation method using measured surrogate parameters to determine the daily ammonia emissions in ppmvd @15% oxygen, as approved by the District.

28. When operating without SCR or oxidation catalyst during the initial commissioning period, the emission from each turbine shall not exceed 50 pounds per hour and the combined emissions from both turbines shall not exceed 65.4 pounds per hour of oxides of nitrogen (NOx), calculated as nitrogen dioxide and measured over each clock hour period. (Rule 20.3(d)(2)(i))

29. When operating without SCR or oxidation catalyst during the initial commissioning period, the emission from each turbine shall not exceed 43.9 pounds per hour and the combined emissions from both turbines shall not exceed 59 pounds per hour of carbon monoxide (CO), measured over each clock hour period. (Rule 23(d)(2)(i))

30. Visible emissions from the lube oil vents and the exhaust stack of the unit shall not exceed 20% opacity for more than three (3) minutes in any period of 60 consecutive minutes. (Rule 50)

31. Total aggregate emissions from all stationary emission units at this stationary source, except emissions or emission units excluded from the calculation of aggregate potential to emit as specified in Rule 20.1 (d) (1), shall not exceed the following limits in each rolling 12-calendar month period. The total aggregate emissions shall include emissions during all times that the equipment is operating, including but not limited to, emissions during periods of commissioning, startup, shutdown and tuning.

i.	Oxides of Nitrogen (NOx):	50 tons/year
ii.	Carbon Monoxide (CO):	100 tons/year
iii.	Volatile Organic Compounds (VOC):	50 tons/year
iv.	Oxides of Sulfur (SOx):	100 tons/year

32. The emissions of any single federal Hazardous Air Pollutant (HAP) shall not equal or exceed 10 tons, and the aggregate emissions of all federal HAPs shall not equal or exceed 25 tons in any rolling 12-calendar month period. Compliance with these single and aggregate HAP limits shall be based on a methodology approved by the District for the purpose of calculating HAP emissions for this permit. If emissions exceed these limits, the permittee shall apply to amend permit to reflect applicable federal Maximum Achievable Control Technology (MACT) standards and requirements in accordance with applicable provisions (including timing requirements) of 40 CFR Part 63.

Ammonia - SCR

33. At least 90 days prior to the start of construction, the applicant shall submit to the District the final selection, design parameters and details of the selective catalytic reduction (SCR) and oxidation catalyst emission control systems. Such information may be submitted to the District as trade secret and confidential pursuant to District Rules 175 and 176.

34. Before operating an SCR system, continuous monitors shall be installed on each SCR system to monitor or calculate, and record the ammonia injection rate (lbs/hour) and the SCR catalyst temperature (°F). The monitors shall be installed, calibrated and maintained in accordance with a District approved protocol. This protocol, which shall include the calculation methodology, shall be submitted to the District for written approval at least 60 days prior to initial startup of the gas turbines with the SCR system. The monitors shall be in full operation at all times when the turbine is in operation.

35. Except during periods when the ammonia injection system is being tuned or one or more ammonia injection systems is in manual control (for compliance with applicable permits), the automatic ammonia injection system serving the SCR shall be in operation in accordance with manufacturer's specifications at all times when ammonia is being injected into the SCR. Manufacturer specifications shall be maintained on site and made available to district personnel upon request.

36. The concentration of ammonia solution used in the ammonia injection system shall be less than 20% ammonia by weight. Records of ammonia solution concentration shall be maintained on site and made available to district personnel upon request.

Definitions

37. For the purposes of this Authority to Construct, startup conditions shall be defined as the time fuel flow begins until the time that the unit complies with the emission limits specified in this Authority to Construct but in no case exceeding 30 minutes per occurrence. Shutdown conditions shall be defined as the time preceeding the moment at which fuel flow ceases and during which the unit does not comply with the emission limits specified in this Authority to Construct but in no cases exceeding 30 minutes per occurrence. The Data Acquisition and Recording System (DAS), as required by 40 CFR75, shall record these events. This condition may be modified by the District based on field performance of the equipment.

38. A CEMS protocol is a document approved in writing by the APCD M&TS division that describes the Quality Assurance and Quality Control procedures for monitoring, calculating and recording stack emissions from the unit.

Testing

39. At least 60 days prior to initial startup of the gas turbines, the applicant shall submit a source test protocol to the District for approval. The source test protocol shall comply with the following requirements:

    a. Measurements of NOX, CO, and O2 emissions shall be conducted in accordance with U.S. Environmental Protection Agency (EPA) methods 7E, 10, and 3A, respectively, and district Source Test, method 100, or alternative methods approved by the District and EPA;
    b. Measurement of VOC emissions shall be conducted in accordance with EPA Methods 25A and/or 18, or alternative methods approved by the District and EPA;
    c. Measurements of PM-10 emissions shall be conducted in accordance with EPA Methods 201A and 202 or alternative methods approved by the district and EPA;
    d. Measurements of ammonia emissions shall be conducted in accordance with Bay Area Air Quality Management District ST-1B or an alternative method approved by the District and EPA;
    e. Source testing shall be performed at the most frequently used load level, as specified in 40 CFR part 75 Appendix A Section 6.52.1.d, provided it is not less than 80% of the unit's rated load unless it is demonstrated to the satisfaction of the district that the unit cannot operate under these conditions . If the demonstration is accepted, then emissions source testing shall be performed at the highest achievable continuous level power level.

f. Measurements of opacity shall be conducted in accordance with EPA Method 9 or an alternative method approved by the District and EPA

g. Measurement of fuel flow shall be conducted in accordance with an approved test protocol.

40. Each turbine shall be equipped with continuous monitors to measure or calculate, and record, the following operational characteristics of each unit:
    i. Hours of operation (hours),
    ii. Natural gas flow rate (scfh),
    iii. Heat input rate (MMBtu /hr),
    iv. Exhaust gas flow rate (dscfm),
    v. Exhaust gas temperature (°F), and
    vi. Power output (gross MW).
    vii. Water(for NOx control) injection rate (lbs/hour) if equipped with water injection.

41. At least 60 days prior to the initial startup of the gas turbines, the applicant shall submit a turbine operation monitoring protocol, which shall include relevant calculation methodologies to the District for written approval. The monitors shall be installed, calibrated, and maintained in accordance with the protocol. The monitors should be in full operation at all times when the turbine is in operation. Calibration records for the continuous monitors shall be maintained on site and made available to the district upon request. The applicant shall make the site available for inspection of the turbine operation monitors and monitor maintenance records by representatives of the District, CARB, and the Energy Commissions.

42. The exhaust stacks for each turbine shall be equipped with source test ports and platforms to allow for the measurement and collection of stack gas samples consistent with all approved test protocols. The ports and platforms shall be constructed in accordance with District Method 3A, Figure 2, and approved by the District.

43. If source testing will be performed by an independent contractor and witnessed by the District, a source test protocol shall be submitted to the District for written approval at least 30 days prior to source testing.

44. Within 45 days after completion of the source test or RATA, a final test report shall be submitted to the District for review and approval.

45. This turbine shall be source tested once each permit year (annual source test) to demonstrate compliance with the emission standards contained in this permit. For the purposes of this permit, a permit year is the 12-month period ending on the last day of the permit expiration month. It is the responsibility of the permittee to schedule the source test with the District. The source test shall be performed or witnessed by the District. Each annual source test shall be separated by at least 90 days. An annual CEMS RATA, where required, may be used to fulfill the annual source testing requirement for NOx and CO. The source test and the NOx and CO RATA tests shall be

conducted in accordance with the RATA frequency requirements of 40 CFR 75, Appendix B, Sections 2.3.1 and 2.3.3

CEMS

46. The applicant shall comply with the continuous emission monitoring requirements of 40 CFR Part 75.

47. At least 60 days prior to the operation of the permanent CEMs, the applicant shall submit a CEMs operating protocol to the District for written approval. The applicant shall make the site available for inspection of the CEMs and CEMs maintenance records by representatives of the District, CARB, and the Energy Commission.

48. A monitoring plan in conformance with 40 CFR 75.53 shall be submitted to U.S EPA Region 9 and the District at least 45 days prior to the Relative Accuracy Test Audit test, as required in 40 CFR 75.62.

49. No later than 90 days after each unit commences commercial operation (defined for this condition as the instance when power is sold to the grid), a Relative Accuracy Test Audit (RATA) and other required certification tests shall be performed an completed on the CEMs in accordance with 40 CFR Part 75 Appendix A Specifications and Test Procedures. At least 60 days prior to the test date, the applicant shall submit a test protocol to the District for written approval. Additionally, the District shall be notified a minimum of 45 days prior to the test so that observers may be present. Within 30 days of completion of this test, a written test report shall be submitted to the District for approval.

50. The oxides of nitrogen (NOX) and oxygen (O2) CEMS shall be certified and maintained in accordance with applicable Federal Regulations including the requirements of Sections 75.10 and 75.12 of Title 40, Code of Federal Regulations Part 75 (40 CFR 75), the performance specifications of Appendix A of 40 CFR 75, the quality assurance procedures of Appendix B of 40 CFR 75 and the CEMS protocol approved by the District. The carbon monoxide (CO) CEMS shall be certified and maintained in accordance with 40 CFR 60, Appendices B and F, unless otherwise specified in this permit, and the CEMS protocol approved by the District.

51. Continuous emission monitoring system (CEMS) shall be installed and properly maintained and calibrated to measure, calculate and record the following, in accordance with the District approved CEMS protocol:
    a. Percent oxygen (O2) in the exhaust gas (%);
    b. Average concentration of oxides of nitrogen (NOx) for each continuous rolling 1-hour period, in parts per million (ppmv) corrected to 15% oxygen;

c. Average concentration of carbon monoxide (CO) for each continuous rolling 1-hour period, in parts per million (ppmv) corrected to 15% oxygen;
d. Annual mass emissions of oxides of nitrogen (NOX), in tons;
e. Annual mass emission of carbon monoxide (CO), in tons.
f. Natural gas flow rate to turbine in hscf/hr.

52. The CEMS shall be in operation in accordance with the district approved CEMs monitoring protocol at all times when the turbine is in operation. A copy of the District approved CEMS monitoring protocol shall be maintained on site and made available to District personnel upon request.

53. When the CEMS is not recording data and the turbine is operating, hourly NOx emissions for the annual emission calculations shall be determined in accordance with 40 CFR 75 Subpart C. Additionally, hourly CO emissions for annual emission calculations shall be determined using CO emission factors to be determined from source test emission factors and fuel consumption data, in terms of pounds per hour of CO for the gas turbine. Emission calculations used to determine hourly emission rates shall be reviewed and approved by the District, in writing, before the hourly emission rates are incorporated into the CEMS emission data.

54. Any violation of any emission standard as indicated by the CEMS shall be reported to the district's compliance division within 96 hours after such occurrence. (H&S Code)

55. The CEMS shall be maintained and operated, and reports submitted, in accordance with the requirements of rule 19.2 Sections (d), (e), (f) (1), (f) (2), (f) (3), (f) (4) and (f) (5), and a CEMS protocol approved by the District.

56. An operating log or data acquisition and handling system (DAHS) records shall be maintained either on site or at a district-approved alternate location to record actual times and durations of all startups and shut-downs, quantity of fuel used (scf) and energy generated (MW-hr), (monthly and annually by calendar year), hours of daily operation and total cumulative hours of operation (monthly and annually by calendar year).

57. Except for changes that are specified in the initial approved NOx monitoring protocol or a subsequent revision to that protocol that is approved in advance, in writing by the District, the District shall be notified in writing at least thirty (30) days prior to any planned changes made in the CEMS /DAHS (including the programmable logic controller) software which affects the value of data displayed on the CEMS / DAHS monitors with respect to the parameters measured by their respective sensing devices or any planned changes to the software that controls the ammonia flow to the SCR. Unplanned or emergency changes shall be reported within 96 hours.

58. Fuel flowmeters with an accuracy of +/- 2% shall be maintained to measure the volumetric flow rate corrected for temperature and pressure. Correction factors and constants shall be maintained on site and made available to the district upon request.

The fuel flowmeters shall meet the applicable quality assurance requirements of 40 CFR part 75, Appendix D, and Section 2.1.6.

Commissioning

59. Beginning at initial startup of each turbine, a Commissioning Period for each turbine shall commence. The Commissioning Period shall end after not more than 200 hours of gas turbine operation. During the Commissioning Period, only the emission limits specified in conditions 28 and 29 shall apply.

60. Within 200 hours of gas turbine operation, after initial startup of each turbine, the applicant shall install post-combustion air pollution control equipment to minimize emissions from this equipment. Once installed, the post-combustion air pollution control equipment shall be maintained in good condition and, with the exception of periods during startup and shutdown, shall be in full operation at all times when the turbine is in stable operation.

61. After the end of the Commissioning Period for each turbine, the applicant shall submit a written progress report to the District. This report shall include, a minimum, the date the Commissioning Period ended, the periods of startup, the emissions of NOx and CO during startup, and the emissions of NOx and CO during steady state operation. NOx and CO emissions shall be reported in both ppmv at 15 percent O2 and lbs/hour. This report shall also detail any turbine or emission control equipment malfunction, upset, repairs, maintenance, modifications, or replacements affecting emissions of air contaminants that occurred during the Commissioning Period.

62. Only one combustion turbine shall be in commissioning mode at a time. Combustion turbine operation for commissioning shall only occur during the hours of 7:00 A.M. to 7:00 P.M.

Additional General Conditions

All records required by this Authority to Construct shall be maintained on site for a minimum of five years and made available to the District upon request.

Conditions for Black start Engine

1. Permittee shall provide access, facilities, utilities and any necessary safety equipment, with the exception of personal protective equipment requiring individual fitting and specialized training, for source testing and inspection upon request of the District.

2. Gaseous fuel engines shall use only gaseous fuel which contains no more than 10 grains of sulfur compounds, calculated as hydrogen sulfide, per 100 cubic feet dry gaseous fuel at standards conditions. Gaseous fuels include natural gas, propane, liquefied petroleum gas (LPG), butane. Gasoline engines shall use only California Reformulated Gasoline. (Rule 62)

3. Visible emissions including crank case smoke shall comply with Rule 50. (Rule 50)

4. At no time shall the subject equipment described cause or contribute to a public nuisance. (Rule 51)

5. A non-resettable engine hour meter shall be installed on this engine, maintained in good working order, and used for recording engine operating hours. If a meter is replaced, the Air Pollution Control District's Compliance Division shall be notified in writing within 10 calendar days. The written notification shall include the following information:
   A. Old meter's hour reading.
   B. Replacement meter's manufacturer name, model, and serial number if available and current hour reading on replacement meter.
   C. Copy of receipt of new meter or of installation work order.

   A copy of the meter replacement notification shall be maintained on site and made available to the Air Pollution Control District upon request. (Rule 69.4.1)

6. The engine operation shall not exceed 0.5 hours per day and 52 hours per calendar year for non-emergency purposes (testing and maintenance). (NSR, Rule 69.4.1)

7. The owner or operator shall conduct periodic maintenance of this engine and any add-on control equipment, as applicable, as recommended by the engine and control equipment manufacturer or as specified by any other maintenance procedure approved in writing in writing by the District. The periodic maintenance shall be conducted at least once each calendar year. (Rule 69.4.1)

8. The owner or operator of the engine shall keep the following records: applicable fuel certification; manual of recommended maintenance provided by the manufacturer, or other maintenance procedure as approved in writing, in advance, by the District. These records shall be kept on site for at least the same period of time as the engine to which the records apply is located at the site. These records shall be made available to the District. (Rule 69.4.1)

9. The owner or operator of this engine shall maintain an operating log containing, at a minimum, the following: dates and times of engine operation, indicating whether the operation was for non- emergency purposes or during an emergency situation and the nature of the emergency, if available (these records are not required if the total engine operations for any purpose, including emergency situation, do not exceed 52 hours in a calendar year); total cumulative hours of operation per calendar year, based on actual readings of engine hour meter or fuel meter; records of periodic maintenance including the dates maintenance, calibration or replacement were performed. (Rule 69.4.1)

10. All operational and maintenance logs required by this permit shall be kept for a minimum of three years, unless otherwise indicated by the conditions of this permit, and these records shall be made available to the District upon request. (Rule 69.4.1)

<u>Conditions for Emergency Fire Pump Engine</u>

1. Permittee shall provide access, facilities, utilities and any necessary safety equipment, with the exception of personal protective equipment requiring individual fitting and specialized training, for source testing and inspection upon request of the District.

2. Engine operation for maintenance and testing purposes shall not exceed 0.5 hour per day and 50 hours per calendar year. (NSR) (17 CCR §93115) (ATCM reportable)

3. The engine shall only use CARB Diesel Fuel. (Rule 69.4.1, 17 CCR §93115)

4. Visible emissions including crankcase smoke shall comply with Air Pollution Control District Rule 50. (Rule 50)

5. The equipment described above shall not cause or contribute to public nuisance. (Rule 51)

6. This engine shall not operate for non-emergency use during the following periods, as applicable:
   A. Whenever there is any school sponsored activity, if engine is located on school grounds or
   B. Between 7:30 and 3:30 PM on days when school is in session, if the engine is located within 500 feet of, but not on school grounds.

   This condition shall not apply to an engine located at or near any school grounds that also serve as the student's place of residence(17 CCR §93115) (ATCM reportable)

8. A non-resettable engine hour meter shall be installed on this engine, maintained in good working order, and used for recording engine operating hours. If a meter is replaced, the Air Pollution Control District's Compliance Division shall be notified in writing within 10 calendar days. The written notification shall include the following information:
   A. Old meter's hour reading.
   B. Replacement meter's manufacturer name, model, and serial number if available and current hour reading on replacement meter.
   C. Copy of receipt of new meter or of installation work order.

   A copy of the meter replacement notification shall be maintained on site and made available to the Air Pollution Control District upon request. (Rule 69.4.1) (17 CCR §93115)

9. The owner or operator shall conduct periodic maintenance of this engine and add-on control equipment, if any, as recommended by the engine and control equipment manufacturers or as specified by the engine servicing company's maintenance procedure. The periodic maintenance shall be conducted at least once each calendar year. (Rule 69.4.1)

10. The owner or operator of the engine shall maintain the following records on site for at least the same period of time as the engine to which the records apply is located at the site:
    A. Documentation shall be maintained identifying the fuel as CARB diesel;

B. Manual of recommended maintenance provided by the manufacturer, or maintenance procedures specified by the engine servicing company; and
C. Records of annual engine maintenance, including the date the maintenance was performed.

These records shall be made available to the Air Pollution Control District upon request. (Rule 69.4.1)

11. The owner or operator of this equipment shall maintain a monthly operating log containing, at a minimum, the following:
A. Dates and times of engine operation, indicating whether the operation was for maintenance and testing purposes or emergency use; and, the nature of the emergency, if known;
B. Hours of operation for all uses other than those specified above and identification of the nature of that use.

(Rule 69.4.1) (17 CCR §93115)

12. All operational and maintenance logs required by this permit shall be kept a minimum of 36 months from their date of creation unless otherwise indicated by the conditions of this permit. The records shall be maintained onsite for a minimum of 24 months from their date of creation. Records for the last 24 months of operation shall be made available to the Air Pollution Control District upon request. Records for operation for the last 25 to 36 months shall be made available to the Air Pollution Control District within 5 working days of request.

ATTACHMENT A

APPROVAL OF AIR QUALITY IMPACT ANALYSIS

AIR QUALITY IMPACT ANALYSIS

FINAL REVIEW REPORT

ORANGE GROVE ENERGY
APPLICATION 985708

OCTOBER 2, 2008
Revised
DECEMBER 2, 2008

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1.0 INTRODUCTION

An Air Quality Impact Analysis (AQIA) was performed for the Orange Grove Energy Project by TRC Solutions of Windsor, CT. This report focuses on Section 6.2 of the AFC (June, 2008), the AQIA analysis results provided and the subsequent modeling analysis performed by the District (September, 2008).

2.0 PROJECT DESCRIPTION

Orange Grove Energy, L.P. is proposing to install two General Electric LM 6000PC SPRINT natural gas fired combustion turbines. The facility will be permitted for 6,400 turbine hours of operation annually but is expected to operate less than 2,000 turbine hours during peak electric demand periods. The project site is located in inland northern San Diego County near Pala, CA.

3.0 AIR QUALITY IMPACT ANALYSIS

Dispersion modeling was conducted for Normal, Startup/Shutdown and Commissioning period emissions of NO_2, CO, SO_2, and PM_{10} and $PM_{2.5}$. The applicant and their consultant (TRC solutions) worked closely with the District in developing modeling and analysis procedures in support of demonstrating compliance with all applicable NSR requirements. Modeling was performed in order to determine whether emissions during these time periods would impact the State and/or Federal Ambient Air Quality Standards for all criteria pollutants.

The modeling procedures are discussed in the following subsections.

3.1 MODELING METHODOLOGIES

AERMOD (Version 06341) was used to perform the refined modeling for various combinations of operating scenarios for the two turbines (Start/Stop, Base Load, % Load, etc.). Stack parameters and emission rates were provided for the turbines running at 100%, 75% and 50% load. The Operational Phase stack parameters and maximum emission rates are presented in Table 3-1.

Commissioning period modeling for the elevated emission rates of NOx and CO existing during these conditions, as well as PM_{10}, $PM_{2.5}$ and SO_2, were also performed. 35 separate commissioning period cases were evaluated. Only one unit will be commissioned at a time. The model inputs used to simulate commissioning period cases are provided in Table 3-2.

All modeling was performed in accordance with EPA guidance and District standard procedures. Regulatory default settings were used. The receptor grid was developed using the EPA"s AERMAP (Version 06341) model. The receptor grid was sufficiently dense to identify maximum impacts.

3.2 METEOROLOGICAL DATA USED FOR DISPERSION MODELING

Meteorological data used for EPA's Aermod Prime model consisted of the following data for the years 2002 and 2003. The data was originally processed by the District using EPA's Aermet meteorological data processor (Version 06341) to produce Aermod ready

files. TRC modified the data using EPA's recently released AERSURFACE model and inputs agreed upon by the District.

- Wind speed, wind direction, standard deviation of the horizontal wind direction and temperature from the Gregory Canyon Landfill monitoring station (approximately 1.0 miles southwest).

- Twice-daily upper-air soundings from Miramar Marine Corps Air Station, San Diego, CA.

- Cloud height and total opaque cloud amount from Palomar Airport, Carlsbad, CA.

- Wind speed, wind direction and temperature data from Palomar Airport, Carlsbad, CA for replacement of missing data in the Gregory Canyon Landfill data set.

TABLE 3-1 – OPERATIONAL PHASE MODELING PARAMETERS

Source Description		Source ID	Stack Height (ft)	Stack Exhaust Temp (°F)	Flow (ACFM)	Velocity (ft/s)	Diam. (ft)	CO 1-hour (lb/hr)	CO 8-hour (lb/hr)	NO2 1-hour (lb/hr)	NO2 Annual (lb/hr)	SO2 1-hour (lb/hr)	SO2 3-hour (lb/hr)	SO2 24-hour (lb/hr)	SO2 Annual (lb/hr)	PM10 24-hour (lb/hr)	PM10 Annual (lb/hr)
Turbine #1: 1-Hour	Base Load, 100%	T1BL100	80.0	840.7	595,551	80.88	12.5	6.12	0	4.30	0	1.00	0	0	0	0	0
	Base Load, 75%	T1BL075	80.0	844.4	512,439	69.60	12.5	4.32	0	3.40	0	0.80	0	0	0	0	0
	Base Load, 50%	T1BL050	80.0	818.4	427,045	58.00	12.5	3.23	0	2.60	0	0.60	0	0	0	0	0
	Start/Stop, 100%	T1SS100	80.0	840.7	595,551	80.88	12.5	15.14	0	15.36	0	0.98	0	0	0	0	0
	Start/Stop, 75%	T1SS075	80.0	844.4	512,439	69.60	12.5	14.54	0	15.06	0	0.82	0	0	0	0	0
	Start/Stop, 50%	T1SS050	80.0	818.4	427,045	58.00	12.5	14.18	0	14.80	0	0.75	0	0	0	0	0
Turbine #2: 1-Hour	Base Load, 100%	T2BL100	80.0	840.7	595,551	80.88	12.5	6.12	0	4.30	0	1.00	0	0	0	0	0
	Base Load, 75%	T2BL075	80.0	844.4	512,439	69.60	12.5	4.32	0	3.40	0	0.80	0	0	0	0	0
	Base Load, 50%	T2BL050	80.0	818.4	427,045	58.00	12.5	3.23	0	2.60	0	0.60	0	0	0	0	0
	Start/Stop, 100%	T2SS100	80.0	840.7	595,551	80.88	12.5	15.14	0	15.36	0	0.98	0	0	0	0	0
	Start/Stop, 75%	T2SS075	80.0	844.4	512,439	69.60	12.5	14.54	0	15.06	0	0.82	0	0	0	0	0
	Start/Stop, 50%	T2SS050	80.0	818.4	427,045	58.00	12.5	14.18	0	14.80	0	0.75	0	0	0	0	0
Turbine #1: Longer Than 1-Hour	100% Load	T1LT100	80.0	840.7	595,551	80.88	12.5	0	10.59	0	2.02	0	0.99	0.98	0.36	***3.0***	1.00
	75 % Load	T1LT075	80.0	844.4	512,439	69.60	12.5	0	9.32	0	1.69	0	0.80	0.80	0.29	***3.0***	0.87
	50% Load	T1LT050	80.0	818.4	427,045	58.00	12.5	0	8.56	0	1.40	0	0.65	0.62	0.22	***3.0***	0.74
Turbine #2: Longer Than 1-Hour	100% Load	T2LT100	80.0	840.7	595,551	80.88	12.5	0	10.59	0	2.02	0	0.99	0.98	0.36	***3.0***	1.00
	75 % Load	T2LT075	80.0	844.4	512,439	69.60	12.5	0	9.32	0	1.69	0	0.80	0.80	0.29	***3.0***	0.87
	50% Load	T2LT050	80.0	818.4	427,045	58.00	12.5	0	8.56	0	1.40	0	0.65	0.62	0.22	***3.0***	0.74
Black Start	1-Hour	BSST	19.17	1123.0	6,637	103.5	1.17	1.85	0	1.38	0	0.01	0	0	0	0	0
	Longer Than 1-Hr	BSLT	19.17	1123.0	6,637	103.5	1.17	0	0.23	0	0.00221	0	0.00281	0.00035	0.00001	0.00167	0.00006
Fire Pump	1-Hour	FPST	18.0	917.0	1,943	164.9	0.50	0.31	0	1.58	0	0.00	0	0	0	0	0
	Longer Than 1-Hr	FPLT	18.0	917.0	1,943	164.9	0.50	0	0.0383	0	0.00935	0	0.00031	0.00004	0.00001	0.00156	0.00022
Cooling Tower	Cell 1	CELL1	30.0	85.0	267,880	29.31	13.93	0	0	0	0	0	0	0	0	0.065	0.024
	Cell 2	CELL2	30.0	85.0	267,880	29.31	13.93	0	0	0	0	0	0	0	0	0.065	0.024
	Cell 3	CELL3	30.0	85.0	267,880	29.31	13.93	0	0	0	0	0	0	0	0	0.065	0.024

1) Source Group naming convention: First two letters indicate Turbine #1's mode (BS = Base Load, SS = Start/Stop, LT = Longer Than 1-Hour).

Likewise, next two letters likewise indicate Turbine #2's mode. Numbers indicate Load percentage.

2) Cooling Tower only used for 100% Load.

3) Bold, italicized and red values indicate District changes.

TABLE 3-2 – COMMISSIONING MODELING PARAMETERS

Case	Source ID Suffix	Stack Exhaust Temp (°F)	Flow (ACFM)	Velocity (ft/s)	CO 1-hour (lb/hr)	CO 8-hour (lb/hr)	NO2 1-hour (lb/hr)	NO2 Annual (lb/hr)	SO2 1-hour (lb/hr)	SO2 3-hour (lb/hr)	SO2 24-hour (lb/hr)	SO2 Annual (lb/hr)	PM10 24-hour (lb/hr)	PM10 Annual (lb/hr)
100	C100	840.3	596,000	80.94	43.90	43.90	43.47	1.98	1.00	1.00	1.00	0.0458	2.70	0.123
101	C101	863.0	544,978	74.01	16.41	16.41	37.72	1.72	0.87	0.87	0.87	0.0398	2.47	0.113
102	C102	852.5	530,476	72.05	27.40	27.40	36.24	1.65	0.84	0.84	0.84	0.0382	2.40	0.110
103	C103	845.1	515,917	70.07	26.32	26.32	34.81	1.59	0.80	0.80	0.80	0.0367	2.34	0.107
104	C104	836.8	501,126	68.06	12.61	12.61	33.37	1.52	0.77	0.77	0.77	0.0352	2.27	0.104
105	C105	827.3	485,887	65.99	13.87	13.87	31.89	1.46	0.74	0.74	0.74	0.0336	2.20	0.101
106	C106	818.4	471,000	63.97	23.03	23.03	30.47	1.39	0.70	0.70	0.70	0.0321	2.13	0.0974
107	C107	807.2	455,841	61.91	21.91	21.91	28.99	1.32	0.67	0.67	0.67	0.0306	2.07	0.0943
108	C108	798.9	441,028	59.90	10.43	10.43	27.59	1.26	0.64	0.64	0.64	0.0291	2.00	0.0912
109	C109	795.2	425,554	57.80	11.41	11.41	26.26	1.20	0.61	0.61	0.61	0.0277	1.93	0.0880
110	C110	811.8	414,097	56.24	18.64	18.64	24.65	1.13	0.57	0.57	0.57	0.0260	1.88	0.0857
111	C111	803.8	398,189	54.08	17.59	17.59	23.26	1.06	0.54	0.54	0.54	0.0246	1.80	0.0824
112	C112	798.0	381,673	51.84	8.28	8.28	21.90	1.00	0.51	0.51	0.51	0.0231	1.73	0.0790
113	C113	793.1	364,726	49.53	8.93	8.93	20.52	0.94	0.48	0.48	0.48	0.0217	1.65	0.0754
114	C114	789.1	349,490	47.47	14.55	14.55	19.22	0.88	0.44	0.44	0.44	0.0203	1.58	0.0723
115	C115	789.6	333,900	45.35	13.60	13.60	17.97	0.82	0.42	0.42	0.42	0.0190	1.51	0.0691
116	C116	794.4	317,830	43.17	6.33	6.33	16.74	0.76	0.39	0.39	0.39	0.0177	1.44	0.0657
117	C117	807.5	313,522	42.58	6.94	6.94	50.35	2.30	0.37	0.37	0.37	0.0169	1.42	0.0649
118	C118	807.8	312,057	42.38	11.99	11.99	49.59	2.26	0.37	0.37	0.37	0.0168	1.41	0.0646
119	C119	809.3	306,147	41.58	11.67	11.67	46.61	2.13	0.36	0.36	0.36	0.0163	1.39	0.0633
120	C120	810.3	300,241	40.78	5.67	5.67	43.71	2.00	0.35	0.35	0.35	0.0159	1.36	0.0621
121	C121	812.2	294,006	39.93	5.51	5.51	40.85	1.87	0.34	0.34	0.34	0.0154	1.33	0.0608
122	C122	814.0	287,530	39.05	5.34	5.34	38.03	1.74	0.33	0.33	0.33	0.0149	1.30	0.0595
123	C123	817.2	280,852	38.14	5.17	5.17	35.30	1.61	0.32	0.32	0.32	0.0145	1.27	0.0581
124	C124	820.1	274,032	37.22	5.00	5.00	32.63	1.49	0.31	0.31	0.31	0.0140	1.24	0.0567
125	C125	822.9	267,116	36.28	4.83	4.83	30.04	1.37	0.30	0.30	0.30	0.0135	1.21	0.0553
126	C126	814.6	260,818	35.42	4.64	4.64	27.40	1.25	0.28	0.28	0.28	0.0130	1.18	0.0540
127	C127	804.2	254,521	34.57	4.45	4.45	24.83	1.13	0.27	0.27	0.27	0.0124	1.15	0.0526
128	C128	794.6	248,240	33.71	4.26	4.26	22.44	1.02	0.26	0.26	0.26	0.0119	1.12	0.0514
129	C129	785.0	241,888	32.85	4.07	4.07	20.17	0.92	0.25	0.25	0.25	0.0114	1.10	0.0500
130	C130	777.3	235,587	32.00	3.89	3.89	18.12	0.83	0.24	0.24	0.24	0.0109	1.07	0.0487
131	C131	768.4	229,214	31.13	3.71	3.71	16.15	0.74	0.23	0.23	0.23	0.0104	1.04	0.0474
132	C132	763.3	225,922	30.68	3.61	3.61	15.18	0.69	0.22	0.22	0.22	0.0101	1.02	0.0467
133	C133	763.1	225,838	30.67	3.61	3.61	15.16	0.69	0.22	0.22	0.22	0.0101	1.02	0.0467
134	C134	763.1	225,838	30.67	3.61	3.61	15.16	0.69	0.22	0.22	0.22	0.0101	1.02	0.0467

Notes:

1) Source ID in model runs comprised of prefix "T1" or "T2" for Turbine #1 and Turbine #2 respectively, plus a suffix denoting the Case.

2) "HROFDY" option to limit emissions to 12 hours per day (8:00 AM to 8:00 PM) for all averaging times.

3) PM2.5 assumed equal to PM10.

4.0 AIR QUALITY IMPACT ANALYSIS RESULTS

In accordance with EPA and San Diego Air Pollution Control District New Source Review Guidance and the modeling methodologies described above, maximum predicted concentrations associated with facility operations were determined for each of the required criteria pollutants and the applicable averaging period during various scenarios of the two turbines in Normal or Startup/Shutdown operation as well as the Commissioning period for each turbine individually. The maximum predicted concentrations occurring during any of the operating conditions and scenarios modeled were added to worst-case background concentrations for comparison to Federal and State Ambient Air Quality Standards. Worst case background concentrations were determined from the review of 3 years (2005-2007) of monitoring data taken from the District's Escondido or San Diego monitoring stations, whichever was available for a specific criteria pollutant and deemed to be most representative of air quality in the facility area. Table 4-1 summarizes the worst case background concentrations.

Tables 4-2, 4-3 and 4-4 summarize maximum Hourly, Daily and Annual emissions for the proposed facility.

The maximum ground-level impacts at any location from the various scenarios of the two turbines in either Normal or Startup/Shutdown operation are given in Table 4-5. This table also includes the comparisons of the proposed project modeled maximum impacts for all scenarios with Federal and California Ambient Air Quality Standards (AAQS) as well as the PSD significant impact levels, including the worst case ambient background concentrations, for the project vicinity.

Tables 4-6 and 4-7 provide the summary of project modeled maximum impacts for the 35 cases modeled for the Commissioning period for each turbine. This table also includes the comparisons of the proposed project modeled maximum impacts for all commissioning cases with Federal and California Ambient Air Quality Standards (AAQS) as well as the PSD significant impact levels, including the worst case ambient background concentrations, for the project vicinity.

Table 4-1 Ambient Air Quality Background Concentration (Baseline) for Project Site

POLLUTANT	AVERAGING PERIOD	2005	2006	2007	BACK-GROUND(1)	MOST STRINGENT STANDARD
NO_2 (ppm)	Highest 1-Hour Average (CAAQS > 0.25 ppm)	0.076	0.071	0.072	0.076 ppm (143.1 µg/m³)	0.18 ppm (339 µg/m³)
NO_2 (ppm)	Annual Average (NAAQS = 0.053 ppm)	0.016	0.017	0.016	0.017 ppm (33.9 µg/m³)	0.030 ppm (57 µg/m³)
CO (ppm)	Highest 1-Hour average	5.9	5.7	5.2	5.9 ppm (6,785 µg/m³)	20 ppm (23,000 µg/m³)
CO (ppm)	Highest 8-Hour average	3.10	3.61	3.20	3.61 ppm (4,152 µg/m³)	9.0 ppm (10,000 µg/m³)
SO_2 (ppm)(2)	Highest 1-Hour Average	0.040	0.034	0.018	0.040 ppm (105 µg/m³)	0.25 ppm (655 µg/m³)
SO_2 (ppm) (2)	Highest 3-Hour Average	0.019	0.030	0.01	0.030 ppm (78.0 µg/m³)	0.5 ppm (1,300 µg/m³)
SO_2 (ppm) (2)	Highest 24-Hour Average	0.006	0.009	0.006	0.009 ppm (23.6 µg/m³)	0.04 ppm (105 µg/m³)
SO_2 (ppm) (2)	Annual Average	0.002	0.004	0.003	0.004 ppm (10.5 µg/m³)	0.03 ppm (80 µg/m³)
PM_{10} (µg/m³)	Highest 24-Hour Average	42.0	51.0	68	68.0 µg/m³	50 µg/m³
PM_{10} (µg/m³)	Annual Arithmetic Mean	23.9	24.2	26.9	26.9 µg/m³	20 µg/m³
$PM_{2.5}$ (µg/m³)	98th Percentile 24-Hour Average	***32.2***	***28.3***	***37.7***	***32.7 µg/m³***	35 µg/m³
$PM_{2.5}$ (µg/m³)	Annual Arithmetic Mean	12.3	11.5	***13.3***	***13.3µg/m³***	12 µg/m³

(1) Background is established using the highest recorded data point from the latest 3 years of available data, except 24–hour $PM_{2.5}$ which uses form of the NAAQS.
(2) SO_2 data were obtained from the San Diego 12th Avenue monitoring station for 2005 and the Beardsley Street monitoring station for 2006-2007. All other data were from the Escondido monitoring station.
(3)Bold, Red and italicized numbers indicate District revisions.

Table 4.2 – Summary of Maximum Hourly Operational Emissions

POLLUTANT	NO_X	CO	VOC	$PM_{10/2.5}$	SO_X
Turbines (lb/hr)	30.73	30.28	4.70	6.14	1.77
Black-Start Engine (lb/hr)	1.39	1.85	0.31	0.04	0.008
Fire-Pump Engine (lb/hr)	1.58	0.31	0.0003	0.04	0.001
Chiller Cooling Tower (lb/hr)	-	-	-	0.20	-
Water Trucks (lb/hr)	2.01	0.62	0.16	0.10	0.002
Maximum Facility Hourly (lb/hr)	**35.70**	**33.05**	**5.16**	**6.51**	**1.78**

(1) Reference Tables 6.2C-12 to 15 of the AFC submittal for detailed calculations and notes.
2) Over 99 percent of PM_{10} emissions are $PM_{2.5}$ for natural gas combustion source (CARB); therefore, these values are applicable to both PM_{10} and $PM_{2.5}$.

Table 4-3 – Summary of Maximum Daily Operational Emissions

POLLUTANT	NO_X	CO	VOC	$PM_{10/2.5}$	SO_X
Turbines (lb/day)	282.5	365.3	34.9	132.8	47.2
Black-Start Engine (lb/day)	1.39	1.85	0.31	0.04	0.008
Fire-Pump Engine (lb/day)	1.58	0.31	0.0003	0.04	0.001
Chiller Cooling Tower (lb/day)	-	-	-	4.69	-
Water Trucks (lb/day)	48.21	14.77	3.79	2.30	0.05
Maximum Facility Daily (lb/day)	**333.71**	**382.26**	**38.96**	**139.91**	**47.26**

(1) Reference Tables 6.2C-12 to 15 of the AFC submittal for detailed calculations and notes.
(2) Over 99 percent of PM_{10} emissions are $PM_{2.5}$ for natural gas combustion source (CARB); therefore, these values are applicable to both PM_{10} and $PM_{2.5}$.

Table 4-4 – Summary of Annual Operational Emissions[1]

POLLUTANT	NO_X	CO	VOC	$PM_{10/2.5}$	SO_X
Turbines: Maximum (lb/yr)	35,413	45,630	3,938	17,550	6,336
Turbines: Expected (lb/yr)	11,448	14,725	1,335	5,508	1,974
Black-Start Engine (lb/yr)	19.39	25.90	4.27	0.56	0.12
Fire-Pump Engine (lb/yr)	81.94	15.92	0.01	1.94	0.05
Chiller Cooling Tower (lb/yr)	-	-	-	625	-
Water Trucks Maximum (lb/yr)	10,043	3,077	790	479	10
Water Trucks Expected (lb/yr)	2,009	615	158	96	2
Maximum Facility Annual (lb/yr)	41,942	47,641	4,448	18,484	6,342
Maximum Facility Annual (tpy)	**20.97**	**23.82**	**2.22**	**9.24**	**3.17**
Average Facility Annual (tpy)	**6.77**	**7.86**	**0.75**	**3.11**	**0.99**

(1) Reference Tables 6.2C-12 to 15 of the AFC submittal for detailed calculations and notes.

Table 4-5 – Summary of Modeling Results for Facility Operation

	Turbine 1 Mode	Turbine 2 Mode	Load	Concentration (µg/m³)																	
				CO				NO_2		PM_{10}			$PM_{2.5}$		SO_2						
				1-Hour		8-Hour		1-Hour	Annual	24-Hour		Annual	24-Hour	Annual	1-Hour	3-Hour		24-Hour		Annual
				H1H	H2H	H1H	H2H	H1H	H1H	H1H	H2H	H1H	H8H	H1H	H1H	H1H	H2H	H1H	H2H	H1H
Operation A (1-hr)	Base Load	Base Load	50%	52.745	.7	---	---	58.3	---	---	---	---	---	---	4.42	---	---	---	---	---
	Base Load	Base Load	75%	52.745	.7	---	---	58.3	---	---	---	---	---	---	5.49	---	---	---	---	---
	Base Load	Base Load	100%	52.745	.8	---	---	58.3	---	---	---	---	---	---	6.73	---	---	---	---	---
Operation B (1-hr)	Base Load	Start/Stop	50%	70.765	.7	---	---	54.6	---	---	---	---	---	---	4.98	---	---	---	---	---
	Base Load	Start/Stop	75%	71.863	.2	---	---	54.6	---	---	---	---	---	---	5.56	---	---	---	---	---
	Base Load	Start/Stop	100%	78.162	.7	---	---	55.0	---	---	---	---	---	---	6.65	---	---	---	---	---
Operation C (1-hr)	Start/Stop	Base Load	50%	73.966	.5	---	---	54.6	---	---	---	---	---	---	5.00	---	---	---	---	---
	Start/Stop	Base Load	75%	70.063	.9	---	---	54.6	---	---	---	---	---	---	5.55	---	---	---	---	---
	Start/Stop	Base Load	100%	76.664	.0	---	---	55.1	---	---	---	---	---	---	6.65	---	---	---	---	---
Operation D (1-hr)	Start/Stop	Start/Stop	50%	108.7	101.2	---	---	57.3	---	---	---	---	---	---	5.55	---	---	---	---	---
	Start/Stop	Start/Stop	75%	106.0	91.8	---	---	54.7	---	---	---	---	---	---	5.62	---	---	---	---	---
	Start/Stop	Start/Stop	100%	107.6	84.7	---	---	54.6	---	---	---	---	---	---	6.57	---	---	---	---	---
Operation E (Periods Longer than 1-hr)	All Modes	All Modes	50%	---	---	21.7	19.5	---	0.387	*3.50*	2.15	0.202	***2.53***	0.202	---	2.78	2.57	0.721	0.640	0.0609
	All Modes	All Modes	75%	---	---	21.1	19.2	---	0.422	*3.11*	2.28	0.215	***2.25***	0.215	---	3.06	2.76	0.830	0.748	0.0718
	All Modes	All Modes	100%	---	---	22.0	20.1	---	0.464	*2.94*	2.50	0.235	***2.12***	0.235	---	3.64	2.97	0.943	0.840	0.0823
Maximum				108.7	101.2	22.0	20.1	58.3	0.464	*3.50*	2.50	0.235	***2.53***	0.235	6.73	3.64	2.97	0.943	0.840	0.0823
CA Signif. Level				2,000	---	500	---	---	1	5	---	1	---	---	---	---	---	5	---	1
National Signif. Level				2,000	---	500	---	---	1	5	---	1	---	---	---	25	---	5	---	1
Background				6,785	6,785	4,152	4,152	143.1	33.9	68.0	68.0	26.9	32.7	***13.3***	105	78	78	23.6	23.6	10.5
Max + Background				6,894	6,886	4,174	4,172	201	34.4	*71.5*	70.5	27.1	***35.2***	***13.5***	112	81.6	81.0	24.5	24.4	10.6
California AAQS				23,000	---	10,000	---	339	57	50	---	20	---	12	655	---	---	105	---	---
National AAQS				---	40,000	---	10,000	---	100	---	150	N/A	35	15	---	---	1,300	---	365	80

Note: Bold and Red values update by District (PM_{10} / $PM_{2.5}$ 3lb/hr emission rate)

Table 4-6 – Summary for Project Commissioning: Turbine #1

		Concentration (µg/m³)																
		CO				NO_2		PM_{10}			$PM_{2.5}$		SO_2					
	Case	1-Hour		8-Hour		1-Hour	Annual	24-Hour		Annual	24-Hour	Annual	1-Hour	3-Hour		24-Hour		Annual
		H1H	H2H	H1H	H2H	H1H	H1H	H1H	H2H	H1H	H8H	H1H	H1H	H1H	H2H	H1H	H2H	H1H
Commissioning Turbine #1	100	99.7	73.7	20.4	15.458.5		0.0282	0.382	0.303	0.00175	0.191	0.00175	2.27	0.757	0.559	0.142	0.112	0.000650
	101	38.8	27.9	8.10	6.1659.8		0.0272	0.370	0.287	0.00178	0.188	0.00178	2.07	0.689	0.494	0.131	0.102	0.000630
	102	65.7	46.6	13.8	10.560.3		0.0273	0.369	0.287	0.00181	0.189	0.00181	2.00	0.667	0.473	0.128	0.0996	0.000630
	103	64.2	44.8	13.6	10.460.8		0.0273	0.365	0.286	0.00183	0.190	0.00183	1.95	0.651	0.455	0.125	0.0981	0.000630
	104	31.5	22.0	6.66	5.1061.3		0.0274	0.362	0.285	0.00186	0.190	0.00186	1.92	0.640	0.448	0.123	0.0966	0.000630
	105	35.4	24.9	7.49	5.7460.3		0.0273	0.358	0.283	0.00189	0.191	0.00189	1.88	0.628	0.441	0.120	0.0949	0.000630
	106	60.0	42.1	12.8	9.7558.9		0.0274	0.356	0.281	0.00192	0.191	0.00192	1.84	0.613	0.430	0.118	0.0929	0.000630
	107	58.3	40.8	12.6	9.4957.4		0.0278	0.355	0.278	0.00198	0.191	0.00198	1.77	0.591	0.414	0.115	0.0897	0.000640
	108	28.2	20.0	6.19	4.6155.7		0.0279	0.355	0.274	0.00202	0.191	0.00202	1.72	0.573	0.406	0.113	0.0871	0.000640
	109	31.4	22.6	6.99	5.1354.1		0.0279	0.353	0.269	0.00205	0.190	0.00205	1.66	0.553	0.399	0.110	0.0843	0.000640
	110	51.7	37.5	11.6	8.4451.2		0.0269	0.347	0.264	0.00205	0.187	0.00205	1.59	0.529	0.383	0.106	0.0805	0.000620
	111	50.0	36.2	11.3	8.1049.1		0.0271	0.406	0.258	0.00210	0.186	0.00210	1.54	0.512	0.371	0.122	0.0773	0.000630
	112	24.2	17.4	5.51	3.8647.0		0.0270	0.421	0.251	0.00213	0.183	0.00213	1.48	0.495	0.356	0.124	0.0738	0.000620
	113	26.8	19.3	6.14	4.2144.6		0.0269	0.405	0.242	0.00216	0.175	0.00216	1.43	0.476	0.344	0.117	0.0699	0.000620
	114	44.6	32.7	10.3	6.9042.1		0.0265	0.399	0.234	0.00217	0.167	0.00217	1.36	0.454	0.333	0.112	0.0657	0.000610
	115	42.5	31.8	9.88	6.4939.5		0.0257	0.400	0.225	0.00217	0.169	0.00217	1.29	0.430	0.321	0.109	0.0612	0.000600
	116	20.1	15.3	4.71	3.0836.9		0.0253	0.383	0.218	0.00218	0.169	0.00218	1.24	0.412	0.313	0.104	0.0589	0.000590
	117	22.1	16.8	5.18	3.3870.9		0.0769	0.380	0.217	0.00217	0.168	0.00217	1.19	0.396	0.301	0.0996	0.0569	0.000560
	118	38.2	29.1	8.97	5.8670.7		0.0759	0.378	0.217	0.00217	0.168	0.00217	1.16	0.388	0.295	0.0976	0.0560	0.000560
	119	37.4	28.5	8.80	5.7470.0		0.0728	0.371	0.217	0.00217	0.169	0.00217	1.14	0.381	0.291	0.0954	0.0559	0.000560
	120	18.3	14.0	4.31	2.8069.3		0.0695	0.361	0.216	0.00217	0.169	0.00217	1.12	0.375	0.287	0.0929	0.0557	0.000550
	121	17.9	13.7	4.22	2.7468.5		0.0662	0.353	0.217	0.00216	0.169	0.00216	1.08	0.361	0.277	0.0884	0.0543	0.000550
	122	17.5	13.5	4.13	2.6767.8		0.0629	0.343	0.217	0.00215	0.168	0.00215	1.07	0.355	0.274	0.0858	0.0544	0.000540
	123	17.1	13.2	4.02	2.6067.0		0.0594	0.334	0.218	0.00214	0.166	0.00214	1.05	0.349	0.271	0.0836	0.0545	0.000530
	124	16.6	13.0	3.92	2.5366.2		0.0561	0.328	0.217	0.00213	0.165	0.00213	1.03	0.343	0.268	0.0821	0.0542	0.000530
	125	16.2	12.8	3.82	2.4564.4		0.0526	0.323	0.215	0.00212	0.163	0.00212	0.984	0.328	0.260	0.0786	0.0524	0.000520
	126	15.7	12.5	3.69	2.3758.1		0.0492	0.319	0.216	0.00212	0.163	0.00212	0.964	0.321	0.257	0.0771	0.0522	0.000510
	127	15.1	12.2	3.57	2.2752.0		0.0457	0.314	0.216	0.00212	0.161	0.00212	0.916	0.305	0.246	0.0735	0.0507	0.000500
	128	14.5	11.8	3.43	2.1846.3		0.0422	0.320	0.217	0.00212	0.161	0.00212	0.893	0.298	0.242	0.0744	0.0505	0.000490
	129	13.9	11.4	3.29	2.1641.0		0.0389	0.312	0.217	0.00212	0.159	0.00212	0.841	0.280	0.230	0.0702	0.0487	0.000480
	130	13.3	11.0	3.15	2.1437.4		0.0356	0.308	0.216	0.00210	0.156	0.00210	0.815	0.272	0.225	0.0690	0.0483	0.000470
	131	12.7	10.6	3.03	2.1136.3		0.0325	0.305	0.216	0.00209	0.155	0.00209	0.790	0.263	0.219	0.0676	0.0478	0.000460
	132	12.5	10.4	3.00	2.1035.3		0.0308	0.303	0.216	0.00208	0.154	0.00208	0.767	0.256	0.214	0.0658	0.0468	0.000450
	133	12.5	10.4	3.00	2.1035.3		0.0308	0.303	0.216	0.00208	0.154	0.00208	0.767	0.256	0.214	0.0658	0.0468	0.000450
	134	12.5	10.4	3.00	2.1035.3		0.0308	0.303	0.216	0.00208	0.154	0.00208	0.767	0.256	0.214	0.0658	0.0468	0.000450
Maximum		99.7	73.7	20.4	15.470.9		0.0769	0.421	0.303	0.00218	0.191	0.00218	2.27	0.757	0.559	0.142	0.112	0.000650
CA Signif. Level		2,000	---	500	---	---	1	5	---	1	---	---	---	---	---	5	---	1
National Signif. Level		2,000	---	500	---	---	1	5	---	1	---	---	---	25	---	5	---	1
Background		6,785	6,785	4,152	4,152	143.1	33.9	68.0	68.0	26.9	32.7	13.4	105	78.0	78.0	23.6	23.6	10.5
Max + Background		6,885	6,859	4,172	4,167	214	34.0	68.4	68.3	26.9	32.9	13.4	107	78.8	78.6	23.7	23.7	10.5
California AAQS		23,000	---	10,000	---	339	57	50	---	20	---	12	655	---	---	105	---	---
National AAQS		---	40,000	---	10,000	---	100	---	150	---	35	15	---	---	1,300	---	365	80

Table 4-7 – Air Modeling Summary for Project Commissioning: Turbine #2

		Concentration (µg/m³)																	
		CO				NO_2		PM_{10}			$PM_{2.5}$		SO_2						
	Case	1-Hour		8-Hour		1-Hour	Annual	24-Hour		Annual	24-Hour	Annual	1-Hour	3-Hour		24-Hour		Annual
		H1H	H2H	H1H	H2H	H1H	H1H	H1H	H2H	H1H	H8H	H1H	H1H	H1H	H2H	H1H	H2H	H1H
Commissioning Turbine #2	100	99.4	71.8	19.3	14.557.7		0.0286	0.369	0.275	0.00178	0.174	0.00178	2.26	0.755	0.545	0.137	0.102	0.000660
	101	39.1	27.2	7.69	5.7959.0		0.0279	0.357	0.256	0.00183	0.174	0.00183	2.08	0.693	0.482	0.126	0.0905	0.000640
	102	66.5	45.5	13.1	9.9259.6		0.0282	0.356	0.250	0.00187	0.171	0.00187	2.02	0.674	0.461	0.123	0.0868	0.000650
	103	65.0	43.7	13.0	9.7660.1		0.0283	0.354	0.248	0.00190	0.167	0.00190	1.98	0.660	0.444	0.122	0.0851	0.000650
	104	31.7	20.9	6.44	4.7960.6		0.0286	0.356	0.247	0.00194	0.168	0.00194	1.94	0.645	0.425	0.121	0.0839	0.000660
	105	35.5	23.3	7.34	5.4061.1		0.0287	0.357	0.246	0.00199	0.168	0.00199	1.89	0.629	0.413	0.120	0.0826	0.000660
	106	59.7	39.8	12.6	9.1661.5		0.0290	0.358	0.245	0.00204	0.169	0.00204	1.83	0.611	0.407	0.118	0.0811	0.000670
	107	57.6	39.2	12.4	8.9161.5		0.0290	0.358	0.243	0.00207	0.169	0.00207	1.75	0.584	0.397	0.116	0.0786	0.000670
	108	28.0	19.2	6.12	4.3259.7		0.0290	0.358	0.241	0.00209	0.168	0.00209	1.70	0.568	0.390	0.113	0.0766	0.000670
	109	31.2	21.6	6.91	4.8157.9		0.0289	0.355	0.238	0.00212	0.167	0.00212	1.65	0.550	0.381	0.111	0.0744	0.000670
	110	51.5	35.8	11.5	7.9254.8		0.0277	0.350	0.233	0.00210	0.164	0.00210	1.58	0.526	0.365	0.107	0.0712	0.000640
	111	49.5	34.7	11.2	7.5952.7		0.0275	0.347	0.229	0.00213	0.163	0.00213	1.52	0.507	0.355	0.104	0.0687	0.000640
	112	23.7	16.7	5.44	3.6350.4		0.0271	0.343	0.225	0.00214	0.161	0.00214	1.45	0.485	0.341	0.101	0.0660	0.000630
	113	26.0	18.4	6.06	3.9947.8		0.0267	0.337	0.219	0.00215	0.158	0.00215	1.38	0.461	0.328	0.0973	0.0631	0.000620
	114	42.7	31.0	10.1	6.6145.2		0.0263	0.331	0.212	0.00215	0.154	0.00215	1.30	0.435	0.316	0.0931	0.0597	0.000610
	115	40.2	30.3	9.73	6.2642.5		0.0256	0.325	0.206	0.00216	0.153	0.00216	1.22	0.407	0.306	0.0884	0.0562	0.000590
	116	19.0	14.7	4.64	2.9439.6		0.0250	0.314	0.200	0.00216	0.151	0.00216	1.17	0.390	0.300	0.0849	0.0541	0.000580
	117	20.9	16.2	5.10	3.2270.7		0.0760	0.311	0.199	0.00214	0.150	0.00214	1.12	0.374	0.290	0.0817	0.0523	0.000560
	118	36.2	28.0	8.83	5.5870.5		0.0750	0.310	0.199	0.00214	0.150	0.00214	1.10	0.367	0.285	0.0801	0.0514	0.000560
	119	35.4	27.7	8.66	5.4469.7		0.0720	0.307	0.199	0.00214	0.150	0.00214	1.08	0.361	0.283	0.0789	0.0513	0.000550
	120	17.2	13.7	4.24	2.6568.9		0.0684	0.302	0.199	0.00213	0.149	0.00213	1.06	0.354	0.281	0.0776	0.0511	0.000540
	121	16.8	13.5	4.15	2.5868.2		0.0651	0.298	0.199	0.00212	0.149	0.00212	1.02	0.340	0.272	0.0745	0.0498	0.000540
	122	16.4	13.3	4.06	2.5067.3		0.0618	0.293	0.199	0.00212	0.148	0.00212	0.998	0.333	0.270	0.0732	0.0497	0.000530
	123	15.9	13.1	3.95	2.4266.5		0.0582	0.287	0.198	0.00210	0.147	0.00210	0.976	0.325	0.267	0.0718	0.0495	0.000520
	124	15.4	12.9	3.85	2.3965.7		0.0548	0.284	0.197	0.00208	0.146	0.00208	0.954	0.318	0.266	0.0710	0.0494	0.000510
	125	14.9	12.6	3.75	2.3664.8		0.0512	0.283	0.197	0.00206	0.144	0.00206	0.906	0.302	0.256	0.0688	0.0479	0.000500
	126	14.3	12.3	3.63	2.3462.5		0.0479	0.282	0.198	0.00206	0.144	0.00206	0.882	0.294	0.253	0.0680	0.0478	0.000500
	127	13.7	12.0	3.50	2.3155.9		0.0444	0.277	0.198	0.00206	0.143	0.00206	0.831	0.277	0.243	0.0648	0.0464	0.000490
	128	13.1	11.7	3.41	2.2749.8		0.0409	0.272	0.199	0.00205	0.142	0.00205	0.804	0.268	0.240	0.0633	0.0462	0.000480
	129	12.5	11.4	3.36	2.2344.1		0.0375	0.267	0.198	0.00204	0.140	0.00204	0.754	0.251	0.229	0.0600	0.0445	0.000460
	130	11.9	11.0	3.30	2.1940.9		0.0343	0.266	0.197	0.00202	0.140	0.00202	0.730	0.243	0.225	0.0596	0.0441	0.000450
	131	11.6	10.6	3.24	2.1538.0		0.0313	0.268	0.197	0.00201	0.139	0.00201	0.720	0.240	0.220	0.0592	0.0436	0.000440
	132	11.3	10.4	3.20	2.1236.8		0.0296	0.267	0.197	0.00201	0.138	0.00201	0.693	0.231	0.214	0.0580	0.0427	0.000430
	133	11.3	10.4	3.21	2.1236.7		0.0296	0.267	0.197	0.00201	0.138	0.00201	0.693	0.231	0.214	0.0581	0.0427	0.000430
	134	11.3	10.4	3.21	2.1236.7		0.0296	0.267	0.197	0.00201	0.138	0.00201	0.693	0.231	0.214	0.0581	0.0427	0.000430
Maximum		99.4	71.8	19.3	14.570.7		0.0760	0.369	0.275	0.00216	0.174	0.00216	2.26	0.755	0.545	0.137	0.102	0.000670
CA Signif. Level		2000	---	500.0	---	---	1.00	5.00	---	1.00	---	---	---	---	---	5.00	---	1.00
National Signif. Level		2000	---	500.0	---	---	1.00	5.00	---	1.00	---	---	---	25.0	---	5.00	---	1.00
Background		6,785	6,785	4,152	4,152	143.1	33.9	68.0	68.0	26.9	32.7	13.4	105.0	78.0	78.0	23.6	23.6	10.5
Max + Background		6,884	6,857	4,171	4,167	213.8	34.0	68.4	68.3	26.9	32.9	13.4	107.3	78.8	78.5	23.7	23.7	10.5
California AAQS		23,000	---	10,000	---	339	57	50	---	20	---	12	655	---	---	105	---	---
National AAQS		---	40,000	---	10,000	---	100	---	150	---	35	15	---	---	1,300	---	365	80

5.0 ADDITIONAL COMMISSIONING MODELING

The original AFC submittal (June 2008) included air quality impact analyses for the commissioning of each turbine separately (Tables 4-6 and 4-7 above), as well as operation of both turbines (Table 4-5 above). However, simultaneous commissioning of one turbine while the other turbine operates was not addressed. Additional analyses to address such scenarios were provided to the District in November, 2008.

For these analyses, the turbine with higher individual impacts for commissioning (Turbine #1) was modeled with the other turbine (Turbine #2) in operating mode. For completeness, all 35 commissioning cases ("100" to "134") were analyzed, as well as all the operation modes (steady-state, start-up/shutdown, and combination of such modes for longer periods). The non-turbine sources (cooling tower cells, black start generator, and emergency fire water pump) were also included.

Tables 5-1 and 5-2 show the air quality impacts predicted by AERMOD. Table 5-1 shows impacts for 1-hour periods.

Table 5-2 shows impacts for periods greater than 1-hour. CO, NO_2, and SO_2 are below the applicable significance levels and ambient air quality standards. The PM_{10} and $PM_{2.5}$ emission rates were set to 3.0 lb/hr for all Turbine #2 operating modes and all Turbine #1 commissioning cases, as was the case for the District's additional modeling performed earlier. The PM_{10} and $PM_{2.5}$ impacts are lower than those presented in the AFC submittal and the earlier additional District modeling performed, which is expected since two turbines in operation can run the entire day (Table 4-5 above) while a turbine in commissioning mode is limited to only part of the day, 7:00A.M. To 7:00 P.M. (HROFDY modeling option).

Table 5-1: Commissioning and Operation: 1-hour Impacts (µg/m³)

	Turbine 1 Mode	Turbine 2 Mode	Load	CO 1-Hour H1H	CO 1-Hour H2H	NO_2 1-Hour* H1H	SO_2 1-Hour H1H
Case A (1-hr)	Commis	Base Load	50%	113.3	83.2	63.6	3.82
	Commis	Base Load	75%	115.5	85.2	63.6	4.21
	Commis	Base Load	100%	118.8	88.1	63.6	4.51
Case B (1-hr)	Commis	Start/Stop	50%	141.2	100.5	73.0	4.22
	Commis	Start/Stop	75%	139.8	102.2	70.3	4.26
	Commis	Start/Stop	100%	138.5	102.8	68.7	4.46
Maximum				141.2	102.8	73.0	4.51
CA Signif. Level**				2,000	---	---	---
National Signif. Level				2,000	---	---	---
Background***				6,785	6,785	143.1	105
Max + Background				6,926	6,888	216	110
California AAQS****				23,000	---	339	655
National AAQS				---	40,000	---	---

* NO_2 1-hour runs use the Ozone Limiting Method (OLM) with hourly Ozone data from Escondido, and default NO_2/NO_x (NO2STACK) ratio of 0.1
** SDAPCD Regulations, Rule 20.1, Table 20.1-13: "Stationary Sources Impacting Any Class II Area"
*** AFC Filing: Table 6.2-4 - Ambient Air Quality Background Concentration (Baseline) for Project Site
**** CARB 4/1/2008: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

Table 5-2: Commissioning and Operation: Impacts (µg/m³)
For Periods Greater than 1-hour

	Turbine 1 Mode	Turbine 2 Mode	Load	CO 8-Hour H1H	CO 8-Hour H2H	NO_2 Annual H1H	PM_{10} 24-Hour H1H	PM_{10} 24-Hour H2H	PM_{10} Annual H1H	$PM_{2.5}$ 24-Hour H8H	$PM_{2.5}$ Annual H1H	SO_2 3-Hour H1H	SO_2 3-Hour H2H	SO_2 24-Hour H1H	SO_2 24-Hour H2H	SO_2 Annual H1H
Case C	Commis	All Modes	50%	25.5	19.3	0.204	1.74	1.62	0.148	1.300.	148	1.66	1.28	0.361	0.341	0.0300
(Periods Longer	Commis	All Modes	75%	25.4	19.2	0.221	1.57	1.45	0.134	1.160.	134	1.84	1.37	0.412	0.395	0.0353
than 1-hr)	Commis	All Modes	100%	25.5	19.2	0.239	1.55	1.48	0.129	1.150.	129	2.05	1.47	0.466	0.443	0.0401
Maximum				25.5	19.3	0.239	1.74	1.62	0.148	1.300.	148	2.05	1.47	0.466	0.443	0.0401
CA Signif. Level**				500	---	1	5	---	1	---	---	---	---	5	---	1
National Signif. Level				500	---	1	5	---	1	---	---	25	---	5	---	1
Background***				4,152	4,152	33.9	68.0	68.0	26.9	32.7	13.4	78.0	78.0	23.6	23.6	10.5
Max + Background				4,178	4,171	34.1	69.7	69.6	27.0	34.0	13.5	80.1	79.5	24.1	24.0	10.5
California AAQS****				10,000	---	57	50	---	20	---	12	---	---	105	---	---
National AAQS				---	10,000	100	---	150	N/A	35	15	---	1,300	---	365	80

** SDAPCD Regulations, Rule 20.1, Table 20.1-13: "Stationary Sources Impacting Any Class II Area"
*** AFC Filing: Table 6.2-4 - Ambient Air Quality Background Concentration (Baseline) for Project Site
**** CARB 4/1/2008: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

6.0 CONCLUSION

The results of the modeling indicate that the proposed facility operations, including Commissioning and Startup/Shutdowns, will not cause or contribute to an exceedance of the Federal and California Ambient Air Quality Standards for NO_2, SO_2 and CO.

For PM_{10}, background concentrations already exceed the annual and 24 hour California standard. Since the background is already in exceedance of the annual standard no additional violations can be due to facility operations. Additionally the 0.24 µg/m³ predicted annual impact is well below PSD significant impact level of 1 µg/m³. Predicted impacts less than SILs are normally considered to not significantly affect compliance with Federal Ambient Air Quality Standards regardless of the background level. Specifically in non-attainment areas, project impacts less than the SILs are deemed to not significantly cause or contribute to violations of the Federal Ambient Air Quality Standard. This can be considered the case for California Ambient Air Quality Standards as well.

Since the District's additional modeling estimated maximum 24 Hour PM_{10} impacts of approximately 3.498 µg/m³, additional AERMOD modeling could be performed for all days in the 2002-2003 period that 24 Hour PM_{10} background concentrations were between 48 µ/m³ and 50 µg/m³ (California Standard) to determine whether additional violations would result from facility operations. There was only one day that concentrations were measured within this range (highest monitored value less than the California Standard), a 48 µg/m³ monitored value on June 26, 2003. Table 5-1 presents the modeling results.

TABLE 6-1 AIR QUALITY IMPACT SUMMARY FOR ADDITIONAL PM 10 MODELING								
DATE	AVG. PERIOD	MAXIMUM MODELED CONCENTRATION (µG/ M^3)	BACK-GROUND (µG/ M^3)	TOTAL (µG/ M^3)	CLASS II SIGNIFICANCE LEVEL (µG/ M^3)	SIL (µG/ M^3)	AMBIENT AIR QUALITY STANDARDS	
							CAAQS (µG/ M^3)	NAAQS (µG/ M^3)
06/26/2003	24-hour	0.89	49	49.89	5	5	50	150

The additional day modeled within that range plus the background concentration for that day resulted in no predicted additional violation of the 24 Hour PM_{10} standard. Therefore it can be concluded that facility operations would not cause or contribute to additional violations of the California 24 Hour Ambient Air Quality Standard for PM_{10}

The modeling results also indicate that no exceedance of the Federal annual or 24 hour $PM_{2.5}$ standard is predicted. Monitored background levels (Table 4-1) exceeded the California annual standard of 12 µg/m^3. Since the background is already in exceedance of the annual standard no additional violations can be due to facility operations. There is no separate California 24 Hour standard for $PM_{2.5}$.

ATTACHMENT B

APPROVAL OF HEALTH RISK ASSESSMENT

Application Numbers 985708-985711

Rule 1200 Health Risk Assessment Report

Facility ID:	**11328A**
Applications:	**985708-985711**
Project Engineer:	Camqui Nguyen
Toxics Risk Analyst:	Michael Kehetian
Date Submitted to Toxics:	11/25/08
Date Completed by Toxics:	12/04/08
HRA Tool Used:	HARP (Versions 1.3 and 1.4a)

The revised Health Risk Assessment (HRA), prepared by TRCsolutions, was reviewed for adherence and technical accuracy with EPA and OEHHA guidance and District Rule 1200 standard procedures.

Type of Sources: two (2) natural gas-fired turbines, one (1) diesel-fired water pump, and one (1) natural gas-fired engine.

Worst-Case Potential Health Impacts

Category	Health Impact	Rule 1200 Significance Level
Maximum Incremental Cancer Risk – Resident (per million)	0.94	1.0 or 10 (with TBACT)
Maximum Incremental Cancer Risk – Worker (per million)	0.0006	1.0 or 10 (with TBACT)
Chronic Noncancer Health Hazard Index - Resident	0.002	1.0
Chronic Noncancer Health Hazard Index - Worker	0.0001	1.0
Acute Noncancer Health Hazard Index - Resident	0.389	1.0
Acute Noncancer Health Hazard Index - Worker	1.03	1.0

The acute noncancer health impacts for commissioning of turbine #1 and startup of turbine #2 were evaluated using the worst-case startup parameters for the turbine (case 133) listed in Appendix 6.2C of the Orange Grove Project, Application for Certification (AFC). Case 133 startup has the lowest stack temperatures and exhaust velocities for the

first 6 minutes with the remainder of the hour modeled at full load operating conditions.

Acute Noncancer Health Hazard Index – Resident	0.389
Acute Noncancer Health Hazard Index – Worker	1.03
Point of Maximum Impact	1.13

The potential health impact at the point of maximum impact (PMI) is the offsite location where the maximum impacts occur. A person may not reasonably be expected to be present at the PMI location for the exposure period of concern.

Further analysis was submitted by the applicant to evaluate the potential health impacts from ammonia and manganese from the cooling tower cells.

Chronic Noncancer Health Hazard Index – Resident	0.0000854
Chronic Noncancer Health Hazard Index – Worker	0.00006

Acute Noncancer Health Hazard Index – Resident	0.00165
Acute Noncancer Health Hazard Index – Worker	0.000739

Worst-Case Potential Emissions:

Each Turbine (Applications 985708 and 985711)

CHEMICAL	EMS Factor (lbs/MMBTU)	HOURLY (lbs/hr)	ANNUAL (lbs/yr)
NH3	5 ppm	3.01E+00	9.64E+03
1,3-Butadiene	4.30E-07	2.03E-04	6.50E-01
Acetaldehyde	4.00E-05	1.89E-02	6.05E+01
Acrolein	6.40E-06	3.02E-03	9.67E+00
Benzene	1.20E-05	5.67E-03	1.81E+01
Ethyl Benzene	3.20E-05	1.51E-02	4.84E+01
Formaldehyde	7.10E-04	3.35E-01	1.07E+03
Propylene Oxide	2.90E-05	1.37E-02	4.38E+01
Toluene	1.30E-04	6.14E-02	1.96E+02
Xylene	6.40E-05	3.02E-02	9.67E+01
B[a]anthracene	1.31E-07	6.19E-05	1.98E-01
B[a]pyrene	8.95E-08	4.23E-05	1.35E-01
B[b]fluoranthene	6.56E-08	3.10E-05	9.92E-02
B[k]fluoranthene	6.56E-08	3.10E-05	9.92E-02
Chrysene	1.46E-07	6.90E-05	2.21E-01
D[a,h]anthracene	1.31E-07	6.19E-05	1.98E-01
In[1,2,3-cd]pyrene	1.31E-07	6.19E-05	1.98E-01
Naphthalene	7.70E-06	3.64E-03	1.16E+01

Non-PAH emission factors: AP-42, Table 3.1-3, April 2000. Natural Gas-Fired Stationary Turbines, Uncontrolled.

PAH emission factors: CATEF, 2000 (maximum factors used). Turbine, Natural Gas-Fired combustion with SCR and CO catalyst.

Diesel-Fired Water Pump (Application 985709)

CHEMICAL	EMS Factor (lbs/MMBTU)	HOURLY (lbs/hr)	ANNUAL (lbs/yr)
1,3-Butadiene	3.91E-05	4.82E-05	2.51E-03
Acetaldehyde	7.67E-04	9.45E-04	4.92E-02
Acrolein	9.25E-05	1.14E-04	5.93E-03
Benzene	9.33E-04	1.15E-03	5.98E-02
Formaldehyde	1.18E-03	1.45E-03	7.56E-02
Propylene	2.58E-03	3.18E-03	1.65E-01
Toluene	4.09E-04	5.04E-04	2.62E-02
Xylene	2.85E-04	3.51E-04	1.83E-02
B[a]anthracene	1.68E-06	2.07E-06	1.08E-04
B[a]pyrene	1.88E-07	2.32E-07	1.21E-05
B[b]fluoranthene	9.91E-08	1.22E-07	6.35E-06
B[k]fluoranthene	1.55E-07	1.91E-07	9.93E-06
Chrysene	3.53E-07	4.35E-07	2.26E-05
D[a,h]anthracene	5.83E-07	7.19E-07	3.74E-05
In[1,2,3-cd]pyrene	3.75E-07	4.62E-07	2.40E-05
Naphthalene	8.48E-05	1.05E-04	5.44E-03

Emission factors: AP-42, Table 3.3-3, September 1996. Diesel-fired ICE, uncontrolled.

Black-Start Engine (Application 985710)

CHEMICAL	EMS Factor (lbs/MMBTU)	HOURLY (lbs/hr)	ANNUAL (lbs/yr)
1,3-Butadiene	2.67E-04	2.43E-04	3.40E-03
Acetaldehyde	8.36E-03	7.60E-03	1.06E-01
Acrolein	5.14E-03	4.67E-03	6.54E-02
Benzene	4.40E-04	4.00E-04	5.60E-03
Ethyl Benzene	3.97E-05	3.61E-05	5.05E-04
Formaldehyde	5.28E-02	4.80E-02	6.72E-01
Hexane	1.11E-03	1.01E-03	1.41E-02
Methanol	2.50E-03	2.27E-03	3.18E-02
Phenol	2.40E-05	2.18E-05	3.05E-04
Toluene	4.08E-04	3.71E-04	5.19E-03
XYLENES	1.84E-04	1.67E-04	2.34E-03
B[a]anthracene	9.69E-08	8.80E-08	1.23E-06
B[a]P	3.79E-09	3.44E-09	4.82E-08
B[b]fluoranthen	7.79E-08	7.08E-08	9.91E-07
B[k]fluoranthen	1.18E-08	1.07E-08	1.50E-07
Chrysene	2.20E-08	2.00E-08	2.80E-07
D[a,h]anthracen	3.79E-09	3.44E-09	4.82E-08
In[1,2,3-cd]pyr	1.06E-08	9.67E-09	3.44E-09
Naphthalene	3.03E-05	2.75E-05	3.85E-04

Non-PAH emission factors: AP-42. 4-stroke, lean-burn, > 650 HP natural gas-fired ICE with 80% control from the use of 3-way catalytic converter.

PAH emission factors: CATEF, 2000 (maximum factors used). 4-stroke, lean-burn, > 650 HP.

Process Data:

Each Turbine (Applications 985708 and 985711)

Operation Parameter	Value
Fuel Usage (MMBTU/hr)	4.72E+02
Annual hours of operation	3,200[a]

[a] Includes 200 hours of commissioning during the first year.

Diesel-Fired Water Pump (Application 985709)

Operation Parameter	Value
Fuel Usage (MMBTU/hr)	1.23
Engine horsepower (bhp)	310
Fuel Consumption (gal/hr)	8.9
Annual hours of operation	52

Black-Start Engine (Application 985710)

Operation Parameter	Value
Fuel Usage (MMBTU/hr)	0.91
Annual hours of operation	14

Release Parameters:

Each Turbine (Applications 985708 and 985711)

Release Parameter	Value
Stack Height (ft)	80
Stack Diameter (ft)	12.5
Temperature deg F	841
Exhaust Velocity (fps)	80.9

Acute noncancer health impacts for commissioning of turbine #1 and startup of turbine #2.

Release Parameter	Temperature deg F	Exhaust Velocity (fps)
Turbine #1	763.1	30.67
Turbine #2	832.9	75.86

Diesel-Fired Water Pump (Application 985709)

Release Parameter	Value
Stack Height (ft)	18
Stack Diameter (ft)	0.5
Temperature deg F	917
Exhaust Velocity (fps)	165

Black-Start Engine (Application 985710)

Release Parameter	Value
Stack Height (ft)	19.2
Stack Diameter (ft)	1.17
Temperature deg F	1,123
Exhaust Velocity (fps)	103.4

As part of this evaluation, the following submittals and documents were reviewed in addition to using the HARP software program to estimating potential health risks.

- Orange Grove Project, Application for Certification (AFC), Section 6.16, Public Health. June, 2008.

- TRCsolutions submittal of additional air toxics impacts for Orange Grove Energy which included estimating potential health impacts cooling tower ammonia and manganese emissions and the acute health impacts of turbine #1 commissioning and startup of turbine #2. December 2, 2008.

ATTACHMENT C

PUBLIC COMMENTS ON THE PRELIMINARY DETERMINATION OF COMPLIANCE (PDOC)

The San Diego County Air Pollution Control District (District) received comments on the PDOC from the public, the applicant and the California Energy Commission. The District considered all comments and where appropriate, changes were incorporated into the Final Determination of Compliance (FDOC). Modifications to the proposed Authority to Construct conditions included changes to address emission limits, parametric monitoring, source testing, and commissioning operations.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
ORANGE GROVE POWER PLANT PROJECT

DOCKET NO. 08-AFC -4
PROOF OF SERVICE
Revised 10/27/08

INSTRUCTIONS: All parties shall either (1) send an original signed document plus 12 copies or (2) mail one original signed copy AND e-mail the document to the address for the Docket as shown below, AND (3) all parties shall also send a printed or electronic copy of the document, which includes a proof of service declaration to each of the individuals on the proof of service list shown below:

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DECLARATION OF SERVICE

I, April Albright declare that on December 04, 2008 I deposited copies of the attached Orange Grove (08-AFC-4) Final Determination Of Compliance in the United States mail at Sacramento, CA, with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

OR

Transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.

Original Signature in dockets
April Albright

Attachments