



# South Coast Air Quality Management District

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October 1, 2008

Mr. Gerardo Rios – via email ([R9AirPermits\\_sc@epa.gov](mailto:R9AirPermits_sc@epa.gov))  
USEPA Region IX, Mail Stop AIR-3  
75 Hawthorne  
San Francisco, CA 94105

**SUBJECT:** Southern California Edison, Mira Loma Substation, ID#51003  
Title V minor revision, Non-RECLAIM, Proposed Change of Conditions

Dear Mr. Rios:

The South Coast Air Quality Management District (AQMD) has received and reviewed a minor Title V revision application from Southern California Edison, Mira Loma Substation, located at 13568 Milliken, Ontario, CA 91761. The permit revision involves increasing the start up emissions for the gas turbine and increasing the allowable operating hours for the black start engine, however, daily fuel use and annual emissions will not increase.

The AQMD has evaluated these applications and made a preliminary determination that the equipment will be operated in compliance with all of the applicable requirements of our rules and regulations.

The AQMD is required under Rule 3005(e) to provide a copy of the proposed permit to the EPA Administrator for a 45-day review. As such, a copy of the proposed revision to the existing Title V permit is attached along with our engineering analysis for your review. We intend to issue the final permit at the then end of EPA's 45-day review period, pending any comments we receive.

If you wish to provide comments or have any questions regarding this project, please contact Mr. Chris Perri at (909) 396-2696/ [cperri@aqmd.gov](mailto:cperri@aqmd.gov), or Mr. John Yee at (909) 396-2531 / [jyee@aqmd.gov](mailto:jyee@aqmd.gov).

Sincerely,

Michael D. Mills, P.E.  
Senior Manager  
General Commercial & Energy Team

cc: Uve Sillat, SCE

Enclosures: Proposed Title V Permit  
Preliminary Engineering Analysis

## **FACILITY PERMIT TO OPERATE**

**SO CAL EDISON CO  
13568B MILLIKEN AVE  
ONTARIO, CA 91761**

### **NOTICE**

IN ACCORDANCE WITH RULE 206, THIS PERMIT TO OPERATE OR A COPY THEREOF MUST BE KEPT AT THE LOCATION FOR WHICH IT IS ISSUED.

THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26 OF THE HEALTH AND SAFETY CODE OF THE STATE OF CALIFORNIA OR THE RULES OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT. THIS PERMIT SHALL NOT BE CONSTRUED AS PERMISSION TO VIOLATE EXISTING LAWS, ORDINANCES, REGULATIONS OR STATUTES OF ANY OTHER FEDERAL, STATE OR LOCAL GOVERNMENTAL AGENCIES.

Barry R. Wallerstein, D. Env.  
EXECUTIVE OFFICER

By \_\_\_\_\_  
Mohsen Nazemi, P.E.  
Deputy Executive Officer  
Engineering & Compliance

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
<b>Process 1 : POWER GENERATION</b>					
<b>System 1 : GAS TURBINE</b>					
GAS TURBINE, UNIT #1, NATURAL GAS, GENERAL ELECTRIC, MODEL LM6000PC SPRINT, SIMPLE CYCLE, 511.5 MMBTU/HR MAX AT HHV, WITH WATER INJECTION WITH A/N:	D1	C3 C4 B5		<p><b>CO:</b> 2000 PPMV (5) [RULE 407,4-2-1982] ; <b>CO:</b> 6 PPMV NATURAL GAS (4) [RULE 1303(a)(1)-BACT,5-10-1996;RULE 1303(a)(1)-BACT,12-6-2002]</p> <p><b>NOX:</b> 25 PPMV NATURAL GAS (8A) [40CFR 60 Subpart KKKK,7-6-2006] ; <b>NOX:</b> 2.5 PPMV NATURAL GAS (4) [RULE 1303(a)(1)-BACT,5-10-1996</p> <p><i>RULE 1303(a)(1)-BACT,12-6-2002</i>] ; <b>PM:</b> 0.1 GRAINS/SCF (5) [RULE 409,8-7-1981] ; <b>PM:</b> 11 LBS/HR (5A) [RULE 409,8-7-1981]</p> <p><b>PM:</b> 0.01 GRAINS/SCF (5B) [RULE 475,10-8-1976;RULE 475,8-7-1978] ; <b>SO2:</b> (9) [40CFR 72 - Acid Rain Provisions,11-24-1997]</p> <p><b>SOX:</b> 0.06 LBS/MMBTU (8) [40CFR 60 Subpart KKKK,7-6-2006] ; <b>VOC:</b> 2 PPMV NATURAL GAS (4) [RULE 1303(a)(1)-BACT,5-10-1996;RULE 1303(a)(1)-BACT,12-6-2002]</p>	<p>A63.1, A63.2, A63.3, A63.4, A63.5, A99.1, A99.2, A195.1, A195.2, A195.3, A195.5, A327.1, C1.1, C1.2, C1.3, D12.1, D29.1, D29.2, D29.3, D82.1, E193.1, K40.1, K67.1</p>

\* (1)(1A)(1B) Denotes RECLAIM emission factor (2)(2A)(2B) Denotes RECLAIM emission rate  
 (3) Denotes RECLAIM concentration limit (4) Denotes BACT emission limit  
 (5)(5A)(5B) Denotes command and control emission limit (6) Denotes air toxic control rule limit  
 (7) Denotes NSR applicability limit (8)(8A)(8B) Denotes 40 CFR limit (e.g. NSPS, NESHAPS, etc.)  
 (9) See App B for Emission Limits (10) See Section J for NESHAP/MACT requirements

\*\* Refer to Section F and G of this permit to determine the monitoring, recordkeeping and reporting requirements for this device.

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
<b>Process 1 : POWER GENERATION</b>					
GENERATOR, 49 MW					
CO OXIDATION CATALYST, BASF, 80 CUBIC FEET OF TOTAL CATALYST VOLUME A/N: 462005 Permit to Construct Issued: 04/03/07	C3	D1			
SELECTIVE CATALYTIC REDUCTION, MODEL CMHT-21, CORMETECH , 547 CU.FT.; WIDTH: 18 FT; HEIGHT: 25 FT 9 IN; LENGTH: 2 FT 6 IN A/N: 462005 Permit to Construct Issued: 04/03/07	C4	D1		NH3: 5 PPMV (4) [RULE 1303(a)(1)-BACT,5-10-1996;RULE 1303(a)(1)-BACT,12-6-2002]	A195.4, D12.2, D12.3, D12.4, E179.1, E179.2, E193.1
STACK, FOR TURBINE #1, HEIGHT: 80 FT; DIAMETER: 13 FT A/N:	B5	D1			
<b>System 2 : EMERGENCY IC ENGINE</b>					
INTERNAL COMBUSTION ENGINE, EMERGENCY POWER, LEAN BURN, NATURAL GAS, WAUKESHA, MODEL VGF36 GL/GLD, 924 BHP WITH A/N: 462004 Permit to Construct Issued: 04/03/07	D6			CO: 185.7 PPMV NATURAL GAS (4) [RULE 1303(a)(1)-BACT,5-10-1996;RULE 1303(a)(1)-BACT,12-6-2002] ; NOX: 82.2 PPMV NATURAL GAS (4) [RULE 1303(a)(1)-BACT,5-10-1996 RULE 1303(a)(1)-BACT,12-6-2002] ; VOC: 84.2 PPMV NATURAL GAS (4) [RULE 1303(a)(1)-BACT,5-10-1996;RULE 1303(a)(1)-BACT,12-6-2002]	C1.4, D12.5, E162.1, E193.1, E193.2, K67.2

\* (1)(1A)(1B) Denotes RECLAIM emission factor (2)(2A)(2B) Denotes RECLAIM emission rate  
 (3) Denotes RECLAIM concentration limit (4) Denotes BACT emission limit  
 (5)(5A)(5B) Denotes command and control emission limit (6) Denotes air toxic control rule limit  
 (7) Denotes NSR applicability limit (8)(8A)(8B) Denotes 40 CFR limit(e.g. NSPS, NESHAPS, etc.)  
 (9) See App B for Emission Limits (10) See Section J for NESHAP/MACT requirements

\*\* Refer to Section F and G of this permit to determine the monitoring, recordkeeping and reporting requirements for this device.

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
<b>Process 1 : POWER GENERATION</b>					
GENERATOR, 645 kW					
<b>System 3 : INORGANIC CHEMICAL STORAGE</b>					
STORAGE TANK, TK-1, AQUEOUS AMMONIA, HORIZONTAL, 10500 GALS A/N: 462001 Permit to Construct Issued: 04/03/07	D9				C157.1, E144.1, E193.1

\* (1)(1A)(1B) Denotes RECLAIM emission factor  
 (2)(2A)(2B) Denotes RECLAIM emission rate  
 (3) Denotes RECLAIM concentration limit  
 (4) Denotes BACT emission limit  
 (5)(5A)(5B) Denotes command and control emission limit  
 (6) Denotes air toxic control rule limit  
 (7) Denotes NSR applicability limit  
 (8)(8A)(8B) Denotes 40 CFR limit(e.g. NSPS, NESHAPS, etc.)  
 (9) See App B for Emission Limits  
 (10) See Section J for NESHAP/MACT requirements

\*\* Refer to Section F and G of this permit to determine the monitoring, recordkeeping and reporting requirements for this device.

**FACILITY PERMIT TO OPERATE  
SO CAL EDISON CO**

**SECTION H: DEVICE ID INDEX**

**The following sub-section provides an index  
to the devices that make up the facility  
description sorted by device ID.**

**FACILITY PERMIT TO OPERATE  
SO CAL EDISON CO**

**SECTION H: DEVICE ID INDEX**

<b>Device Index For Section H</b>			
<b>Device ID</b>	<b>Section H Page No.</b>	<b>Process</b>	<b>System</b>
D1	1	1	1
C3	2	1	1
C4	2	1	1
B5	2	1	1
D6	2	1	2
D9	3	1	3

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

#### DEVICE CONDITIONS

##### A. Emission Limits

A63.1 The operator shall limit emissions from this equipment as follows:

CONTAMINANT	EMISSIONS LIMIT
NOX	Less than 1556 LBS IN ANY ONE MONTH
PM10	Less than 1487 LBS IN ANY ONE MONTH
CO	Less than 2134 LBS IN ANY ONE MONTH
SOX	Less than 82 LBS IN ANY ONE MONTH
VOC	Less than 423 LBS IN ANY ONE MONTH

#### THIS CONDITION APPLIES AFTER THE COMMISSIONING MONTH ONLY

The operator shall calculate the annual emission limit(s) by using fuel use data and the following emission factors: VOC: 3.13 lbs/mmcf, PM10: 11.03 lbs/mmcf, and SOx: 0.64 lbs/mmcf.

Compliance with the NOx and CO emission limits shall be verified through CEMS data. If CO CEMS data is not available, CO emissions shall be calculated using fuel usage and a factor of 15.16 lbs/mmcf during normal operations, 8.58 lbs/hr during any start up hour, and 7.69 lbs/hr during any shutdown hour. The operator shall use the appropriate missing data procedures if NOx data is not available

If a CEMS calibration occurs within 60 minutes of a start up, NOx emissions for the calibration period shall be calculated using the actual duration of the calibration in minutes times a factor of 0.0792 lb/min, and shall only occur when NOx emissions are at or below BACT levels

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D1]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

A63.2 The operator shall limit emissions from this equipment as follows:

CONTAMINANT	EMISSIONS LIMIT
NOX	Less than 2930 LBS IN ANY ONE MONTH
PM10	Less than 1637 LBS IN ANY ONE MONTH
CO	Less than 3778 LBS IN ANY ONE MONTH
SOX	Less than 94 LBS IN ANY ONE MONTH
VOC	Less than 542 LBS IN ANY ONE MONTH

**THIS CONDITION APPLIES DURING THE COMMISSIONING MONTH ONLY.**

The operator shall calculate the annual emission limit(s) by using fuel use data and the following emission factors: During commissioning with no control- NOx: 252.35 lb/mmcf; CO: 154.28 lbs/mmcf, VOC: 9.39 lb/mmcf; PM10: 11.03 lbs/mmcf, and SOx: 0.64 lb/mmcf . During commissioning with water injection- NOx: 103.42 lbs/mmcf, all other factors remain the same. During normal operation- VOC: 3.13 lbs/mmcf, PM10: 11.03 lbs/mmcf, and SOx: 0.64 lbs/mmcf

Compliance with the NOx and CO emission limits shall be verified through CEMS data. If CO CEMS data is not available, CO emissions shall be calculated using fuel usage and a factor of 15.16 lbs/mmcf during normal operations, 8.58 lbs/hr during any start up hour, and 7.69 lbs/hr during any shutdown hour. The operator shall use the appropriate missing data procedures if NOx data is not available

If a CEMS calibration occurs within 60 minutes of a start up, NOx emissions for the calibration period shall be calculated using the actual duration of the calibration in minutes times a factor of 0.0792 lb/min, and shall only occur when NOx emissions are at or below BACT levels

**[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]**

[Devices subject to this condition : D1]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

A63.3 The operator shall limit emissions from this equipment as follows:

CONTAMINANT	EMISSIONS LIMIT
NOX	Less than 5707 LBS IN ANY ONE YEAR
PM10	Less than 4411 LBS IN ANY ONE YEAR
CO	Less than 7728 LBS IN ANY ONE YEAR
SOX	Less than 254 LBS IN ANY ONE YEAR
VOC	Less than 1347 LBS IN ANY ONE YEAR

THIS CONDITION APPLIES DURING THE 1ST 12 MONTHS OF OPERATION ONLY, and the limits apply to the total emissions from the turbine plus the engine

The operator shall calculate the annual emission limit(s) by using fuel use data and the following emission factors for the turbine: During commissioning with no control- NOx: 252.35 lb/mmcf; CO: 154.28 lbs/mmcf, VOC: 9.39 lb/mmcf; PM10: 11.03 lbs/mmcf, and SOx: 0.64 lb/mmcf . During commissioning with water injection- NOx: 103.42 lbs/mmcf, all other factors remain the same. During normal operation- VOC: 3.13 lbs/mmcf, PM10: 11.03 lbs/mmcf, and SOx: 0.64 lbs/mmcf

The operator shall calculate the annual emission limit(s) by using hourly operation data and the following emission factors for the engine: NOx: 2.54 lbs/hr, CO: 3.56 lbs/hr, VOC: 0.92 lbs/hr, PM10: 0.064 lbs/hr, SOx: 0.0038 lbs/hr

Compliance with the NOx and CO emission limits shall be verified through CEMS data. If CO CEMS data is not available, CO emissions shall be calculated using fuel usage and a factor of 15.16 lbs/mmcf during normal operations, 8.58 lbs/hr during any start up hour, and 7.69 lbs/hr during any shutdown hour. The operator shall use the appropriate missing data procedures if NOx data is not available

If a CEMS calibration occurs within 60 minutes of a start up, NOx emissions for the calibration period shall be calculated using the actual duration of the calibration in minutes times a factor of 0.0792 lb/min, and shall only occur when NOx emissions are at or below BACT levels

For the purpose of this condition, the yearly emission limit shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12 month period beginning on the first day of each calendar month.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D1]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

A63.4 The operator shall limit emissions from this equipment as follows:

CONTAMINANT	EMISSIONS LIMIT
NOX	Less than 5511 LBS IN ANY ONE MONTH
CO	Less than 6415 LBS IN ANY ONE MONTH
VOC	Less than 1233 LBS IN ANY ONE MONTH
PM10	Less than 4148 LBS IN ANY ONE MONTH
SOX	Less than 218 LBS IN ANY ONE MONTH

THIS CONDITION APPLIES AFTER THE 1st 12 MONTHS OF OPERATION, and the limits apply to the total emissions from the turbine plus the engine

The operator shall calculate the annual emission limit(s) by using fuel use data and the following emission factors for the turbine: VOC: 3.15 lbs/mmcf, PM10: 11.19 lbs/mmcf, and SOx: 0.62 lbs/mmcf

The operator shall calculate the annual emission limit(s) by using hourly operation data and the following emission factors for the engine: NOx: 2.54 lbs/hr, CO: 3.56 lbs/hr, VOC: 0.92 lbs/hr, PM10: 0.064 lbs/hr, SOx: 0.0038 lbs/hr

Compliance with the NOx and CO emission limits shall be verified through CEMS data. If CO CEMS data is not available, CO emissions shall be calculated using fuel usage and a factor of 14.35 lbs/mmcf during normal operations, 8.58 lbs/hr during any start up hour, and 7.69 lbs/hr during any shutdown hour. The operator shall use the appropriate missing data procedures if NOx data is not available

If a CEMS calibration occurs within 60 minutes of a start up, NOx emissions for the calibration period shall be calculated using the actual duration of the calibration in minutes times a factor of 0.0792 lb/min, and shall only occur when NOx emissions are at or below BACT levels

For the purpose of this condition, the yearly emission limit shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12 month period beginning on the first day of each calendar month

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D1]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

A63.5 The operator shall limit emissions from this equipment as follows:

CONTAMINANT	EMISSIONS LIMIT
NOX	Less than 55 LBS IN ANY ONE DAY

The purpose of this condition is to ensure that the facility emissions are below the CEQA thresholds, and the limit is based on the total emissions from the turbine and the black start generator. The operator shall keep records on the NOx daily emissions. The operator shall keep records on the daily NOx emissions

[CA PRC CEQA, 11-23-1970]

[Devices subject to this condition : D1]

A99.1 The 2.5 PPM NOX emission limit(s) shall not apply during commissioning, start-up, shutdown and an emergency electrical grid system blackout when the turbine is used to start another major generating station. Commissioning shall not exceed 25 hours total, with no more than 5 hrs uncontrolled and no more than 20 hrs with water injection. Each start-up shall not exceed 15 min. Each shutdown shall not exceed 10 min. There shall be no more than 60 start ups per year in the first year of operation, and 200 start-ups per year thereafter..

NOx emissions for the hour which includes a start shall not exceed 10.36 lbs, and for the hour which includes a shutdown 6.44 lbs.

In the case of a start during an emergency electrical grid system blackout, total NOx shall not exceed 28.23 lbs/hr

In case of a turbine shutdown which occurs less than 75 minutes from a start up, the emissions calculated for the shutdown shall not include any of the first 15 minutes of the start up, and the emissions calculated for the start up shall not include any of the last 10 minutes of the shutdown

A shutdown is defined as a reduction in turbine load ending in a period of zero fuel flow. The hour which includes a shutdown is defined as the 60 minutes counted back from the period of zero fuel flow

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(1)-Modeling, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]**

[Devices subject to this condition : D1]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

- A99.2 The 6.0 PPM CO emission limit(s) shall not apply during commissioning, start-up, shutdown, and an emergency electrical grid system blackout when the turbine is used to re-start another major electric generating station. Commissioning shall not exceed 25 hours total, with no more than 5 hrs uncontrolled and no more than 20 hrs with water injection. Each start-up shall not exceed 15 min. Each shutdown shall not exceed 10 min. There shall be no more than 60 start ups per year in the first year of operation, and 200 start-ups per year thereafter..

CO emissions for the hour which includes a start shall not exceed 8.58 lbs, and for the hour which includes a shutdown 7.69 lbs

In case of a turbine shutdown which occurs less than 75 minutes from a start up, the emissions calculated for the shutdown shall not include any of the first 15 minutes of the start up, and the emissions calculated for the start up shall not include any of the last 10 minutes of the shutdown

A shutdown is defined as a reduction in turbine load ending in a period of zero fuel flow. The hour which includes a shutdown is defined as the 60 minutes counted back from the period of zero fuel flow

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(1)-Modeling, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002**]

[Devices subject to this condition : D1]

- A195.1 The 2.5 PPMV NOX emission limit(s) is averaged over 60 minutes at 15 percent O2, dry.

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(1)-Modeling, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002**]

[Devices subject to this condition : D1]

- A195.2 The 6.0 PPMV CO emission limit(s) is averaged over 60 minutes at 15 percent O2, dry.

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(1)-Modeling, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002**]

[Devices subject to this condition : D1]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

A195.3 The 2.0 PPMV VOC emission limit(s) is averaged over 60 minutes at 15 percent O<sub>2</sub>, dry.

**[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(1)-Modeling, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]**

[Devices subject to this condition : D1]

A195.4 The 5 PPMV NH<sub>3</sub> emission limit(s) is averaged over 60 minutes at 15% O<sub>2</sub>, dry basis. The operator shall calculate and continuously record the NH<sub>3</sub> slip concentration using the following:

$$\text{NH}_3 \text{ (ppmv)} = [a-b*c/1E+06]*1E+06/b.$$

where, a = NH<sub>3</sub> injection rate (lbs/hr)/17(lb/lb-mol), b = dry exhaust gas flow rate (scf/hr)/385.3 scf/lb-mol), c = change in measured NO<sub>x</sub> across the SCR (ppmvd at 15% O<sub>2</sub>)

The operator shall install and maintain a NO<sub>x</sub> analyzer to measure the SCR inlet NO<sub>x</sub> ppmv accurate to plus or minus 5 percent calibrated at least once every twelve months. The NO<sub>x</sub> analyzer shall be installed and operated within 90 days of initial start-up.

The operator shall use the above described method or another alternative method approved by the Executive Officer.

The ammonia slip calculation procedures described above shall not be used for compliance determination or emission information without corroborative data using an approved reference method for the determination of ammonia.

**[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002]**

[Devices subject to this condition : C4]

A195.5 The 25 PPMV NO<sub>x</sub> emission limit(s) is averaged over 4 hours rolling at 15 percent O<sub>2</sub>, dry.

**[40CFR 60 Subpart KKKK, 7-6-2006]**

[Devices subject to this condition : D1]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

A327.1 For the purpose of determining compliance with District Rule 475, combustion contaminant emissions may exceed the concentration limit or the mass emission limit listed, but not both limits at the same time.

[RULE 475, 10-8-1976; RULE 475, 8-7-1978]

[Devices subject to this condition : D1]

### C. Throughput or Operating Parameter Limits

C1.1 The operator shall limit the fuel usage to no more than 4.50 MM cubic feet per day.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D1]

C1.2 The operator shall limit the fuel usage to no more than 400 MM cubic feet per year.

The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition and the records shall be made available upon AQMD request.

For the purpose of this condition, the yearly fuel use limit shall apply only during the 1st 12 months of operation.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D1]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

C1.3 The operator shall limit the fuel usage to no more than 392 MM cubic feet per year.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

For the purpose of this condition, the yearly fuel use limit shall apply after the 1st 12 months of operation. The yearly emission limit shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12 month period beginning on the first day of each calendar month.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D1]

C1.4 The operator shall limit the operating time to no more than 90 hour(s) in any one year.

The 90 hours per year limit may include up to 64 hours per year operating time to maintain engine readiness.

[RULE 1110.2, 6-3-2005; RULE 1304(c)-Offset Exemption, 6-14-1996; RULE 1401, 3-4-2005]

[Devices subject to this condition : D6]

C157.1 The operator shall install and maintain a pressure relief valve set at 50 psig.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002]

[Devices subject to this condition : D9]

### **D. Monitoring/Testing Requirements**

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

- D12.1 The operator shall install and maintain a(n) flow meter to accurately indicate the fuel usage being supplied to the turbine.

The operator shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D1]

- D12.2 The operator shall install and maintain a(n) flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia.

The operator shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : C4]

- D12.3 The operator shall install and maintain a(n) temperature gauge to accurately indicate the temperature at the exhaust at the inlet to the SCR reactor.

The operator shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : C4]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

- D12.4 The operator shall install and maintain a(n) pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches of water column.

The operator shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months.

[**RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]**

[Devices subject to this condition : C4]

- D12.5 The operator shall install and maintain a(n) non-resettable elapsed time meter to accurately indicate the elapsed operating time of the engine.

[**RULE 1110.2, 6-3-2005; RULE 1304(c)-Offset Exemption, 6-14-1996; RULE 1401, 3-4-2005]**

[Devices subject to this condition : D6]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

D29.1 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
NOX emissions	District method 100.1	1 hour	Outlet of the SCR serving this equipment
CO emissions	District method 100.1	1 hour	Outlet of the SCR serving this equipment
SOX emissions	Approved District method	District-approved averaging time	Fuel Samples
VOC emissions	Approved District method	1 hour	Outlet of the SCR serving this equipment
PM10 emissions	Approved District method	District-approved averaging time	Outlet of the SCR serving this equipment
NH3 emissions	District method 207.1 and 5.3 or EPA method 17	1 hour	Outlet of the SCR serving this equipment

The test shall be conducted after AQMD approval of the source test protocol, but no later than 180 days after initial start-up. The AQMD shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine generating output in MW.

The test shall be conducted in accordance with AQMD approved test protocol. The protocol shall be submitted to the AQMD engineer no later than 45 days before the proposed test date and shall be approved by the AQMD before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at loads of 100, 75, and 50 percent.

For natural gas fired turbines only, VOC compliance shall be demonstrated as follows: a) Stack gas samples are extracted into Summa canisters maintaining a final canister pressure between 400-500 mm Hg absolute, b) Pressurization of canisters are done with zero gas analyzed/certified to contain less than 0.05 ppmv total hydrocarbon as carbon, and c) Analysis of canisters are per EPA Method TO-12 (with pre concentration) and temperature of canisters when extracting samples for analysis is not below 70 deg F

The use of this alternative method for VOC compliance determination does not mean that it is more accurate than AQMD Method 25.3, nor does it mean that it may be used in lieu of AQMD Method 25.3 without prior

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

approval except for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas fired turbines.

Because the VOC BACT level was set using data derived from various source test results, this alternate VOC compliance method provides a fair comparison and represents the best sampling and analysis technique for this purpose at this time. The test results shall be reported with two significant digits.

**[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]**

[Devices subject to this condition : D1]

D29.2 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
NH3 emissions	District method 207.1 and 5.3 or EPA method 17	1 hour	Outlet of the SCR serving this equipment

The test shall be conducted and the results submitted to the District within 45 days after the test date. The AQMD shall be notified of the date and time of the test at least 7 days prior to the test.

The test shall be conducted at least quarterly during the first twelve months of operation and at least annually thereafter. The NOx concentration, as determined by the CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable, a test shall be conducted to determine the NOx emissions using District Method 100.1 measured over a 60 minute averaging time period.

The test shall be conducted to demonstrate compliance with the Rule 1303 concentration limit.

**[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]**

[Devices subject to this condition : D1]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

D29.3 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
SOX emissions	Approved District method	District-approved averaging time	Fuel Samples
VOC emissions	Approved District method	1 hour	Outlet of the SCR serving this equipment
PM10 emissions	Approved District method	District-approved averaging time	Outlet of the SCR serving this equipment

The test shall be conducted at least once every three years.

The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine generating output in MW.

The test shall be conducted in accordance with AQMD approved test protocol. The protocol shall be submitted to the AQMD engineer no later than 45 days before the proposed test date and shall be approved by the AQMD before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at 100 percent load.

The test shall be conducted for compliance verification of the BACT VOC 2.0 ppmv limit.

For natural gas fired turbines only, VOC compliance shall be demonstrated as follows: a) Stack gas samples are extracted into Summa canisters maintaining a final canister pressure between 400-500 mm Hg absolute, b) Pressurization of canisters are done with zero gas analyzed/certified to contain less than 0.05 ppmv total hydrocarbon as carbon, and c) Analysis of canisters are per EPA Method TO-12 (with pre concentration) and temperature of canisters when extracting samples for analysis is not below 70 deg F

The use of this alternative method for VOC compliance determination does not mean that it is more accurate than AQMD Method 25.3, nor does it mean that it may be used in lieu of AQMD Method 25.3 without prior approval except for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas fired turbines.

Because the VOC BACT level was set using data derived from various source test results, this alternate VOC compliance method provides a fair comparison and represents the best sampling and analysis technique for this purpose at this time. The test results shall be reported with two significant digits.

## **FACILITY PERMIT TO OPERATE SO CAL EDISON CO**

### **SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE**

The operator shall comply with the terms and conditions set forth below:

**[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]**

[Devices subject to this condition : D1]

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

D82.1 The operator shall install and maintain a CEMS to measure the following parameters:

NOx concentration in ppmv

CO concentration in ppmv

Concentrations shall be corrected to 15 percent oxygen on a dry basis. The CEMS shall be installed and operating no later than 90 days after initial startup of the turbine, in accordance with an approved AQMD Rule 218 CEMS plan application. The operator shall not install the CEMS prior to receiving initial approval from AQMD.

The CEMS will convert the actual NOx and CO concentrations to mass emission rates (lbs/hr) and record the hourly emission rates on a continuous basis.

The CEMS shall be installed and operated to measure the NOx and CO concentration over a 15 minute averaging time period.

The CEMS shall convert the actual CO concentrations to mass emission rates (lbs/hr) using the equation below and record the hourly emission rates on a continuous basis.

CO Emission Rate, lbs/hr =  $K * C_{co} * F_d [20.9 / (20.9\% - \%O_2 d)] [(Q_g * HHV) / 10E6]$ , where

$K = 7.267 * 10^{-8}$  (lbs/scf)/ppm

$C_{co}$  = Average of 4 consecutive 15 min. average CO concentrations, ppm

$F_d$  = 8710 dscf/MMBTU natural gas

$\%O_2, d$  = Hourly average % by volume O2 dry, corresponding to  $C_{co}$

$Q_g$  = Fuel gas usage during the hour, scf/hr

HHV = Gross high heating value of the fuel gas, BTU/scf

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(1)-Modeling, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]

[Devices subject to this condition : D1]

### E. Equipment Operation/Construction Requirements

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

E144.1 The operator shall vent this equipment, during filling, only to the vessel from which it is being filled.

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002**]

[Devices subject to this condition : D9]

E162.1 The operator shall use this equipment only during utility failure periods, except for maintenance purposes.

[**RULE 1110.2, 6-3-2005; RULE 1304(c)-Offset Exemption, 6-14-1996; RULE 1401, 3-4-2005**]

[Devices subject to this condition : D6]

E179.1 For the purpose of the following condition number(s), continuously record shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour..

Condition Number D 12- 2

Condition Number D 12- 3

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002**]

[Devices subject to this condition : C4]

E179.2 For the purpose of the following condition number(s), continuous monitoring shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

Condition Number D 12- 4

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002**]

[Devices subject to this condition : C4]

## **FACILITY PERMIT TO OPERATE SO CAL EDISON CO**

### **SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE**

The operator shall comply with the terms and conditions set forth below:

E193.1 The operator shall upon completion of construction, operate and maintain this equipment according to the following specifications:

In accordance with all mitigation measures stipulated in the Negative Declaration prepared for this project (CEQA State Clearinghouse No. 2006121112).

[CA PRC CEQA, 11-23-1970]

[Devices subject to this condition : D1, C4, D6, D9]

E193.2 The operator shall operate and maintain this equipment according to the following specifications:

The TA Luft carburetor settings shall be maintained at all times

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002]

[Devices subject to this condition : D6]

### **K. Record Keeping/Reporting**

## FACILITY PERMIT TO OPERATE SO CAL EDISON CO

### SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

K40.1 The operator shall provide to the District a source test report in accordance with the following specifications:

Source test results shall be submitted to the District no later than 60 days after the source test was conducted.

Emission data shall be expressed in terms of concentration (ppmv) corrected to 15 percent oxygen (dry basis), mass rate (lb/hr), and lb/MMCF. In addition, solid PM emissions, if required to be tested, shall also be reported in terms of grains per DSCF.

All exhaust flow rate shall be expressed in terms of dry standard cubic feet per minute (DSCFM) and dry actual cubic feet per minute (DACFM).

All moisture concentration shall be expressed in terms of percent corrected to 15 percent oxygen.

Source test results shall also include the oxygen levels in the exhaust, fuel flow rate (CFH), the flue gas temperature, and the generator power output (MW) under which the test was conducted.

**[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(a)(1)-BACT, 12-6-2002; RULE 1303(b)(1)-Modeling, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]**

[Devices subject to this condition : D1]

K67.1 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

Commissioning hours and type of control and fuel use

Date and time of each start-up and shutdown

Natural gas fuel use after the commissioning period and prior to CEMS certification

CEMS minute data during start up and shutdown

**[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1303(b)(2)-Offset, 12-6-2002]**

[Devices subject to this condition : D1]

## **FACILITY PERMIT TO OPERATE SO CAL EDISON CO**

### **SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE**

The operator shall comply with the terms and conditions set forth below:

K67.2 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

Date of operation, the elapsed time, in hours, and the reason for operation. Records shall be kept and maintained on file for a minimum of two years and made available to district personnel upon request

[RULE 1110.2, 6-3-2005; ~~RULE 1304(c)-Offset Exemption, 6-14-1996~~; RULE 1401, 3-4-2005]

[Devices subject to this condition : D6]



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**PERMIT TO CONSTRUCT EVALUATION**

**APPLICANT:**

Southern California Edison  
2244 Walnut Grove Ave  
Rosemead, CA 91770

**EQUIPMENT LOCATION:**

13568 Milliken Ave.  
Ontario, CA 91761

**EQUIPMENT DESCRIPTION:**

Section H of the Facility Permit, ID# 51003. Proposed changes or additions are shown in **bold/underline**, proposed deletions are shown in ~~strikethrough~~.

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions and Requirements	Conditions
<b>PROCESS 1: POWER GENERATION</b>					
<b>SYSTEM 1: GAS TURBINE</b>					
GAS TURBINE, UNIT NO. 1, NATURAL GAS, GENERAL ELECTRIC MODEL LM6000PC SPRINT, SIMPLE CYCLE WITH WATER INJECTION, 429 511.5 MMBTU/HR, WITH A/N: 470513 <u>478602</u>	DI			CO: 6 PPM NATURAL GAS (4) [RULE 1303(a)(1)-BACT]; CO: 2000 PPM (5) [RULE 407]; NOX: 2.5 PPM NATURAL GAS (4) [RULE 1303(a)(1)-BACT]; NOX: 25 PPM NATURAL GAS (8) [40 CFR60 SUBPART KKKK]; VOC: 2 PPM NATURAL GAS (4) [RULE 1303(A)(1)-BACT]; PM: 0.1 GR/SCF (5) [RULE 409]; PM: 11 LBS/HR (5) [RULE 475]; PM: 0.01 GR/SCF (5A) [RULE 475]; SOX: 0.060 LBS/MMBTU (8) [40CFR 60 SUBPART KKKK] SO2: (9) [40CFR 72 – ACID RAIN]	<u>A63.1, A63.2, A63.3, A63.4, A99.1, A99.2, A99.3, A195.1, A195.2, A195.3, A327.1, D12.1, C1.1, C1.2, C1.3, D29.1, D29.2, D29.3, D82.1, E193.3, K40.1, K67.1</u>
STACK, TURBINE NO. 1, DIAMETER: 13 FT, HEIGHT: 80 FT A/N: 470513 <u>478602</u>	S4				
<b>SYSTEM 2: EMERGENCY ENGINE</b>					
INTERNAL COMBUSTION ENGINE, EMERGENCY POWER, NATURAL GAS, WAUKESHA, MODEL VGF36	D5			NOX: 1.25 GR/BHPH (4) [RULE 1303-BACT] CO: 1.75 GR/BHPH (4) [RULE 1303-BACT]; VOC (4) 0.45 GR/BHPH (4) [RULE 1303-	<u>A63.3, A63.4, C1.4, D12.5, D29.4, K67.2, E162.1, E193.2</u>



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Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions and Requirements	Conditions
<b>PROCESS 1: POWER GENERATION</b>					
GL/GLD, 865 924 BHP A/N: 462004 479364				BACT}	

**FACILITY DESCRIPTION**

The site is located at 13568 Milliken Ave, in Ontario, CA 91761, adjacent to an existing SCE substation where electrical interconnections will be made. To the south of the site is property currently being developed as a commercial/industrial project. To the east is Milliken Avenue, and to the north and west is the existing SCE substation.

The SCE facility consists of a natural gas fired GE LM6000 combustion turbine generator rated at 49 net MW, associated air pollution control equipment in the form of in-duct oxidation and reduction catalysts, a 10,000 gallon aqueous ammonia storage tank, and an 924 hp emergency internal combustion engine.

**BACKGROUND:**

The initial permit to construct was issued on March 1, 2007. Construction was completed on the unit in the summer of 2007, and first fire was around July 23 of that year. The permit contains restrictions on the number and duration of start ups, the NOx emissions during starts, and the daily and annual fuel use. The existing conditional limits are as follows:

*Current Permit Limits*

Daily Fuel Use	4.50 mmcf/day
Annual Fuel Use	400 mmcf/year for the 1 <sup>st</sup> year of operation, and 490 mmcf/yr for each year thereafter
Annual NOx	5716 lbs/yr
Number of starts	60 for the 1 <sup>st</sup> year, 120 thereafter
Start up duration	15 minutes
Start Up NOx	7.66 lbs

There are additional conditions limiting the monthly emissions of all criteria pollutants as required by Rule 1313.

SCE has submitted this set of applications to request the following changes to their permit:

1. Remove the limit on start up NOx, or at least increase it from 7.66 lbs to 10.36 lbs
2. Include an exemption from BACT for maintenance periods and emergency grid black out situations
3. Increase the allowable operating time for the emergency engine from 7 hours per year to 64 hours per year
4. Change the permitted heat input from 429 mmbtu/hr to 511.5 mmbtu/hr

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5. Change the permitted output from 45 MW to 49 MW
6. Increase the allowable start ups from 120/yr to 200/yr, and reduce the allowable annual fuel use from 490 mmcf/yr to 392 mmcf/yr

SCE is proposing that the daily fuel use and the annual emissions will not increase.

The following applications were submitted for this project:

Table A-1 – Project Application Numbers

A/N	Submittal Date	Equipment	Previous A/N
478600	2/27/08	Gas turbine	478602
479361	3/18/08	Emergency IC engine	479364
478601	2/27/08	Title V	//////////

The applications were deemed complete on 4/4/08.

Emissions are below the RECLAIM thresholds, and therefore the facility is *NOT* in Reclaim. The facility is however, included in Title V because it is subject to the Federal Acid Rain provisions.

**PROCESS DESCRIPTION:**

The turbine operates as a peaking unit, mainly coming on line in the summer months when demand is highest.

The following data was provided by SCE regarding the unit's hours of operation:

Time Frame	Operating Hours
From July 31, 2007 to February 29, 2008	202.12

SCE reports that in the time between the start of commercial operation and March 1, 2008, the unit had been started 82 times. Out of the 82 starts, 18 exceeded the NOx limit of 7.66 lbs (about 22%). The data is summarized as follows:

Date	Start Up NOx
11/15/07	8.65
11/26/07	9.02
11/27/07	8.46
12/08/07	9.07
12/09/07	8.56
12/12/07	9.32
12/13/07	14.34
12/14/07	10.29
12/15/07	10.28



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Date	Start Up NOx
12/16/07	9.42
12/21/07	9.00
12/22/07	9.76
12/31/07	8.73
1/18/08	9.01
1/22/08	9.58
1/22/08	74.97
1/24/08	9.09
1/27/08	8.85

SCE has provided data that shows the higher heat input for the turbines at maximum firing rate. This discrepancy is probably due to an underestimation by GE when they provided SCE with the turbine operating specs.

The higher heat input rates were recorded as follows:

Date	Time	Hourly Fuel Use	Corresponding Heat Input @ 1050 btu/cf
1/27/08	17:00	0.4727 mmcf	496.3 mmbtu/hr
1/27/08	18:00	0.4750 mmcf	498.8 mmbtu/hr
1/27/08	19:00	0.4767 mmcf	500.5 mmbtu/hr

SCE is also requesting an exemption from the NOx and CO BACT limits for a scenario where the turbine needs to be started during a grid failure. In a case like this, there would be no power to operate the electrically pre-heated ammonia injection chamber, which is used to atomized and delivered ammonia to the distribution header and injection grid. SCE estimates it would take 40 minutes for the turbine to reach BACT levels in these cases.

Blackstart Engine

The evaluation for the permit to construct was based on the blackstart engine operating a maximum of 7 hours per year. According to documents provided by SCE, the engine manufacturer requires maintenance and testing on a weekly basis for a total of 52 hours per year. SCE is also requesting an additional 12 hours per year for any testing that may be required by the California Independent System Operator (CAISO) as a part of their inspections to ensure peaker readiness. The equipment will be given an additional 26 hours per year to operate in the event of an emergency, for a total of 90 hours. Note: emergency engines are allowed 200 hours per year. The engine rating will be changed from 865 bhp to 924 bhp to reflect the manufacturer's nameplate rating.

**COMPLIANCE RECORD REVIEW:**

There are no records of violation issues with this facility in the AQMD database.



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SCE requested and received a variance to allow an increase in the number of start ups for the first year of operation. The variance allowed up to 120 starts per year. SCE is currently operating under a stipulated order for abatement allowing increased NOx emissions during start up. The order is set to expire on October 11, 2008.

**EMISSIONS:**

**Normal Operation Hourly Emissions**

Due to the increase in maximum hourly heat input, emissions of all pollutants on an hourly basis for the normal operation will be increasing.

Also note that the calculation methodology for the gaseous pollutants (NOx, CO, and VOC) during normal operation is changing for this application. Previously SCE provided manufacturer guaranteed emission rates. These rates were slightly higher than the rates that would have been calculated using EPA Method 19 (F-factor) calculations. With the increase in maximum hourly firing rate under this application, the "manufacturer guarantees" are no longer valid, ie using them would result in a back-calculated emission concentration BELOW the BACT limit. Therefore, for this modification, the emission rates for NOx, CO, and VOC WILL be calculated using Method 19.

Pollutant	Current Normal Operation Emission Rate lbs/hr	Source	New Normal Operation Emission Rate lbs/hr	Source
NOx	4.2	Manufacturer	4.82	Method 19
CO	6.2	Manufacturer	7.04	Method 19
VOC	1.28	Manufacturer	1.34	Method 19
PM10	4.51	Manufacturer	5.41	Previous factor X 20% higher fuel use rate
SO2	0.26	0.006 lbs/mmbtu (AP-42)	0.31	0.006 lbs/mmbtu (AP-42)

**Start Up/Shut Down Emissions**

The increase in start up NOx emissions is due to NOx concentrations which are higher than what SCE originally anticipated during the first 15 minutes of a start when there is no ammonia injection. An increase in fuel based emissions of PM10 and SOx will also be assumed for the start up hour. However, emission rates of CO and VOC, which are controlled by the oxidation catalyst should not be affected during the start up. Shutdown emission rates remain unchanged.



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Pollutant	Current Start Up Emission Rate lbs/hr	Source	New Start Up Emission Rate lbs/hr	Source
NOx	7.66	Manufacturer	10.36	Applicant
CO	8.58	Manufacturer	8.58	Manufacturer
VOC	1.34	Manufacturer	1.34	Manufacturer
PM10	4.51	Manufacturer	5.41	Previous factor X 20% higher fuel use rate
SO2	0.25	0.006 lbs/mmbtu (AP-42)	0.31	0.006 lbs/mmbtu (AP-42)

**Daily and Monthly Emissions**

The daily and monthly emissions will continue to be calculated assuming 1 start up and shutdown per day with 30 days per month, using the existing daily fuel use limit (4.5 mmcf/day).

**Annual Emissions**

The annual fuel use limit will be reduced from 490 mmcf/yr to 392 mmcf/yr to accommodate the request to increase the limit on start ups, from 120/yr to 200/yr. Therefore the increase in annual start up NOx emissions is offset by the reduction in fuel use and an overall reduction in the total hours of normal operation (and resulting reduction in normal emissions even with the higher hourly emission rates), which is due to the higher maximum heat rate.

The following table illustrates:

Emissions Scenario	Current, lbs	Modified, lbs	Difference, lbs
Annual Start Up NOx	919.2	2072.0	+1152.8
Annual Shutdown NOx	772.8	1288.0	+515.2
Annual Normal Operations NOx	4023.78	1922.28	-2101.5
Total	5715.78	5282.23	-433.5

The total facility emissions for all criteria pollutants will remain below the Reg. XIII exemption thresholds, including the black start generator.

Emissions are summarized below, and calculations can be referenced in the Appendices.

**Maximum Hourly Emissions, Normal Operations**

Pollutant	Uncontrolled Hourly Emissions	Previous Controlled Hourly Emissions	Proposed Controlled Hourly Emissions
NOx	126.00	4.20	4.75
CO	48.80	6.20	6.94
VOC	1.99	1.28	1.32
PM10	5.41	4.51	5.41
SOx	0.30	0.26	0.30
NH3	3.72	3.10	3.72



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**Maximum Hourly Emissions, Startup and Shutdown**

Pollutant	Shutdown Hourly Emissions	Previous Startup Hourly Emissions	Proposed Startup Hourly Emissions
NOx	6.44	7.66	10.36
CO	7.77	8.66	8.66
VOC	1.52	1.56	1.56
PM10	4.51	4.51	5.41
SOx	0.26	0.26	0.31

**Maximum Daily Emissions**

Pollutant	Uncontrolled Daily Emissions	Previous Controlled Daily Emissions*	Proposed Controlled Daily Emissions*
NOx	1154.22	51.87	50.82
CO	447.03	71.28	65.96
VOC	20.84	14.09	12.14
PM10	49.58	49.58	49.58
SOx	2.75	2.75	2.75
NH3	34.08	40.31	34.08

\* includes 1 start up and shutdown

**Monthly Emissions**

Pollutant	Previous Controlled Emissions 30 SU/SD* lbs/month	Proposed Controlled Emissions 30 SU/SD* lbs/month
NOx	1557.31	1540.90
CO	2167.35	2007.67
VOC	438.09	380.93
PM10	1488.63	1461.57
SOx	85.82	81.68

\* Monthly emissions are calculated assuming daily fuel use of 4.5 mmscf/day and 1 start/shutdown per day, for 30 days.



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**Annual Emissions Turbine Only**

Pollutant	Previous Total Annual Emissions <sup>(1)</sup>		Proposed Total Annual Emissions <sup>(2)</sup>	
	lbs/yr	TPY	Lbs/yr	TPY
NOx	5715.78	2.86	5282.28	2.64
CO	7911.47	3.96	6094.19	3.05
VOC	1595.90	0.80	1150.89	0.58
PM10	5403.18	2.70	4142.14	2.07
SOx	311.49	0.16	218.06	0.11
NH3	3714.20	1.86	29713.60	1.49

- (1) Assumes 120 starts and 120 shutdowns per year, 490 mmcf/yr total fuel use  
 (2) Assumes 200 starts and 200 shutdowns per year, 392 mmcf/yr total fuel use

**Engine Emissions**

Pollutant	Previous Emissions		Proposed Emissions	
	lbs/hr	lbs/yr	Lbs/hr	Lbs/yr*
NOx	2.38	16.671	2.54	228.96
CO	3.33	23.340	3.56	320.55
VOC	0.857	6.002	0.92	82.43
PM10	0.0637	0.446	0.0637	5.73
SOx	0.0038	0.026	0.0038	0.34

\* Assumes 90 hr/yr operation

**Annual Emissions Turbine + Black Start Engine**

Pollutant	Previous Total Annual Emissions <sup>(1)</sup>		Proposed Total Annual Emissions <sup>(2)</sup>	
	lbs/yr	TPY	Lbs/yr	TPY
NOx	5732.47	2.87	5511.24	2.76
CO	7934.81	3.97	6414.75	3.21
VOC	1601.90	0.80	1233.32	0.62
PM10	5403.63	2.70	4147.88	2.07
SOx	311.52	0.16	218.40	0.11
NH3	3714.20	1.86	29713.60	1.49

- (1) Assumes 120 starts and 120 shutdowns per year, 490 mmcf/yr total fuel use for the turbine and 64 hrs/yr for the engine  
 (2) Assumes 200 starts and 200 shutdowns per year, 392 mmcf/yr total fuel use for the turbine and 90 hrs/yr for the engine



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**Total Facility Annual Emissions**

Pollutant	Previous Total Facility Annual Emissions <sup>(1)</sup>		Proposed Total Facility Annual Emissions <sup>(1)</sup>	
	lbs/yr	TPY	Lbs/yr	TPY
NOx	7967.04	3.98	7745.82	3.87
CO	8407.99	4.20	6887.93	3.44
VOC	2728.26	1.36	2359.68	1.18
PM10	5442.10	2.72	4186.36	2.09
SOx	386.90	0.19	293.79	0.15

*(1) Includes turbine, black start engine, 2 diesel emergency engines, and fuel dispensing equipment*

**Toxic Emissions**

Toxic emissions will increase on a maximum hourly basis due to the higher maximum heat input. On an annual basis, however, there will be a reduction because the annual fuel limit will be reduced. See Appendix D.

**Turbine**

Pollutant	AP-42 Emission Factor (lb/mmbtu)	Current Maximum Hourly Emission Rate (lb/hr)	Proposed Maximum Hourly Emission Rate (lb/hr)	Current Annual Emission (lbs/yr)	Proposed Annual Emissions (lb/yr)
1,3 Butadiene	4.30E-07	1.82E-04	2.20E-04	3.12E-01	1.76E-01
Acetaldehyde	4.00E-05	1.69E-02	2.05E-02	2.90E+01	1.63E+01
Acrolein	6.40E-06	2.70E-03	3.27E-03	4.65E+00	2.61E+00
Benzene	1.50E-05	6.34E-03	7.67E-03	1.09E+01	6.13E+00
Ethylbenzene	3.20E-05	1.35E-02	1.64E-02	2.32E+01	1.31E+01
Formaldehyde	7.10E-04	3.00E-01	3.63E-01	5.15E+02	2.90E+02
Naphthalene	1.30E-06	5.50E-04	6.65E-04	9.44E-01	5.31E-01
PAH	2.20E-06	9.30E-04	1.13E-03	1.60E+00	8.99E-01
Propylene Oxide	2.90E-05				
		1.23E-02	1.48E-02	2.11E+01	1.18E+01
Toluene	1.30E-04	5.50E-02	6.65E-02	9.44E+01	5.31E+01
Xylene	6.40E-05	2.70E-02	3.27E-02	4.65E+01	2.61E+01
Ammonia	N/A	3.10E+00	3.72E+00	5.25E+03	2.97E+03



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**EVALUATION:**

**RULE 212-Standards for Approving Permits**

This project is not subject to the Rule 212 public notice requirements because the daily maximum CO, NO<sub>x</sub>, and PM10 emissions from the project are not increasing and the facility is not located within 1000 feet of a school (the closest school is Colony High School located approximately 0.9 miles NW of the site).

**RULE 218 – Continuous Emission Monitoring**

In accordance with Rule 218(c), (e), (f), the applicant has submitted an “Application for CEMS” for CO CEMS for each CT, and received final certification on August 15, 2008. Continued compliance with this rule is expected.

**RULE 401 – Visible Emissions**

This rule limits visible emissions to an opacity of less than 20 percent (Ringlemann No.1), as published by the United States Bureau of Mines. Visible emissions are not expected under normal operation from the equipment.

**RULE 402 - Nuisance**

This rule requires that a person not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which cause, or have a natural tendency to cause injury or damage to business or property. The equipment is not expected to create nuisance problems.

**RULE 407 – Liquid and Gaseous Air Contaminants**

This rule limits CO emissions to 2000 ppmv. The SO<sub>2</sub> portion of the rule does not apply as the natural gas fired in the turbine will be subject to the sulfur limit in Rule 431.1. The CO emissions from the turbine will be controlled by an oxidation catalyst to 6 ppmvd at 15% O<sub>2</sub>. Therefore, compliance with this rule is expected. The black start engine is not subject to this rule.

**RULE 409 – Combustion Contaminants**

This rule restricts the discharge of contaminants from the combustion of fuel to 0.23 grams per cubic meter (0.1 grain per cubic foot) of gas, calculated to 12% CO<sub>2</sub>, averaged over 15 minutes. The turbine is expected to meet this limit at the maximum firing load based on the calculations shown below.

$$\text{Grain Loading} = [(A \times B)/(C \times D)] \times 7000 \text{ gr/lb}$$

where:

A = PM10 emission rate during normal operation, 4.0 lb/hr

B = Rule specified percent of CO<sub>2</sub> in the exhaust (12%)

C = Percent of CO<sub>2</sub> in the exhaust (approx. 4.29% for natural gas)



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D = Stack exhaust flow rate, 4.61 scf/hr

$$\begin{aligned} \text{Grain Loading} &= \frac{4.0 \text{ lbs/hr} \times [(7000 \text{ grains/lb}) \times (12/4.29)]}{4.61 \text{ E}+06 \text{ scf/hr}} \\ &= \boxed{0.017 \text{ grains/scf}} \end{aligned}$$

The initial compliance test on the turbine showed PM emissions 0.0011 gr/scf at 100% load. The black start engine is not subject to this rule.

RULE 431.1 – Sulfur Content of Gaseous Fuels

The natural gas supplied to the turbine and the black start engine is expected to comply with the 16 ppmv sulfur limit (calculated as H<sub>2</sub>S) specified in this rule. Commercial grade natural gas has an average sulfur content of 4ppm. The applicant will comply with reporting and record keeping requirements as outlined in subdivision (e) of this rule.

RULE 475 – Electric Power Generating Equipment

This rule applies to power generating equipment greater than 10 MW installed after May 7, 1976. Requirements are that the equipment meet a limit for combustion contaminants of 11 lbs/hr or 0.01 gr/scf. Compliance is achieved if either the mass limit or the concentration limit is met. Mass PM<sub>10</sub> emissions from the turbine are estimated at 4.0 lbs/hr, and 0.0061 gr/scf during natural gas firing at maximum firing load (see calculations below). Therefore, compliance is expected. The initial performance test showed PM emissions of 0.0011 gr/scf at 100% load.

$$\text{Stack Exhaust Flow} \left( \frac{\text{scf}}{\text{hr}} \right) = F_d \times \frac{20.9}{(20.9 - \%O_2)} \times \text{TFD}$$

where:

F<sub>d</sub>: Dry F factor for fuel type, 8710 dscf/MMBtu

O<sub>2</sub>: Rule specific dry oxygen content in the effluent stream, 3%

TFD: Total fired duty measured at HHV, 453 MMBtu/hr

$$\text{Combustion Particulate} \left( \frac{\text{grain}}{\text{scf}} \right) = \frac{PM_{10}, \text{ lb/hr}}{\text{Stack Exhaust Flow, scf/hr}} \times 7000 \frac{\text{gr}}{\text{lb}}$$

$$\text{Stack flow} = 8710(20.9/17.9) \times 453 = 4.61 \text{ mmscf/hr}$$

$$\text{Combustion particulate} = (4.0/4.61\text{E}+06) \times 7000 = \boxed{0.0061 \text{ gr/scf}}$$

RULE 1110.2 – Emissions from Engines

The rule limits NO<sub>x</sub>, CO, and VOC emissions from engines. The rule contains an exemption for engines which are used to power turbines during start ups. Since this engine is used in a black-out situation to provide power to start the turbine when no grid electricity is available, it qualifies for this exemption.



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*RULE 1135 – Emissions of NOx from Electric Power Generating Systems*

This rule applies to the electric power generating systems of several of the major utility companies in the basin, including SCE. The plants which are included in the RECLAIM program are no longer subject to the requirements of this rule. The proposed SCE Etiwanda plant will not be in RECLAIM. However, the new simple cycle turbine does not fall under the definition of an “electric power generating system.” Under the rule, an electric power generating system is defined as all boilers or replacement units and all alternative or advanced combustion devices. An advanced combustion device is further defined as a cogeneration, combined cycle, intercooled, chemically recuperated, or other advanced combustion turbine, while an alternative resource is solar, geothermal, wind generation, etc. Therefore, the proposed SCE turbine is not subject to the requirements of Rule 1135.

*REGULATION XIII – New Source Review*

The permit modifications proposed under these applications will not result in an increase in annual emissions. Additionally, there is no increase in the average daily or monthly emissions. However, there will be an increase in the maximum HOURLY emission rates for NOx, CO, VOC, and PM10 for the turbine, and an increase in the maximum HOURLY emission rates for NOx, CO, VOC, PM10, and SOx for the engine.

1. BACT

Since there is no increase in average monthly emissions, there is no BACT review required. Both the turbine and the engine comply with current BACT limits anyway.

2. Offsets

Rule 1303(b)(2) requires that all increases in emissions be offset unless exempt from offset requirements pursuant to Rule 1304.

Rule 1304(d) allows for an offset exemption for any facility that has the potential to emit less than 4 tons per year for NOx, VOC, SOx, and PM10, and less than 29 tons per year for CO. The facility was originally permitted under this exemption in 2007. The annual emissions are decreasing as a result of the modification, therefore, the exemption still applies.

**Annual PTE Mira Loma Facility**

Equipment	NOx	CO	VOC	PM10	SOx
Turbine	5282	6094	1151	4142	218
Black Start Engine	229	321	82	6	0.34
370 HP Diesel ICE	791	303	15	12	15
1490 HP Diesel ICE	1444	171	72	26	60
Fuel Dispensing	0	0	1039	0	0
Total, lbs/yr	7746	6889	2359	4186	293.34
Total, tpy	3.99	2.81	1.07	1.55	0.16
Offset Threshold	4	29	4	4	4
Exempt	YES	YES	YES	YES	YES

\* all turbine emissions come from post commissioning years, which result in the highest annual emissions



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Rule 1313(g) requires that a monthly emission limit be placed on the permit. The monthly emission limits will be reflected in condition A63.

### 3. Modeling

The facility was required to perform 1 hour NO<sub>x</sub>, CO, and SO<sub>2</sub>, and 8 hour CO and SO<sub>2</sub> modeling to evaluate the increase in the hourly emission rates of these pollutants for the turbine ONLY. The engine is exempt from modeling, it was however, modeled in the original application for CEQA purposes only. The revised modeling showed compliance with the most stringent ambient air quality standard as required under Rule 1303. The results are presented below. Model inputs can be referenced in Appendix E.

#### Model Results Normal Operation

Pollutant	Averaging Period	Maximum Predicted Impact (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	AAQS (ug/m3)
NO <sub>2</sub>	1-hour	3.20	189.82	192.96	338
CO	1-hour	4.73	4347.87	3093.83	23000
	8-hour	1.93	3352.43	2175.89	10000
SO <sub>2</sub>	1-hour	0.19	62.81	26.36	655
	3-hour	0.15	31.41	18.46	1300

*Notes:*

*Background concentrations obtained from the Fontana Station, except CO which is from the Upland Station. SO<sub>2</sub> 1-hour and 3-hour standards are from 40CFR, NO<sub>2</sub> is the new state standard.*

#### Start Up Model Results (NO<sub>2</sub> – 1 hour)

Site/Scenario	Maximum Predicted Impact (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)	Standard (ug/m3)
Mira Loma/12 min	7.0	189.82	196.82	338
Mira Loma/40 min	19.1	189.82	208.92	338

*Background concentrations obtained from the Fontana Station, except CO which is from the Upland Station. NO<sub>2</sub> is the new state standard.*

The modeling was reviewed by AQMD planning staff and deemed acceptable. See memo from Naveen Berry to Mike Mills dated September 23, 2008.

The Mira Loma facility is not a major source because the total emissions from the facility are below the major source threshold of 10 tpy. Therefore, the additional requirements for major sources are not applicable.

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*RULE 1401 – New Source Review of Toxic Air Contaminants*

This rule specifies limits for maximum individual cancer risk (MICR), cancer burden, and noncancer acute and chronic hazard index (HI) from new permit units, relocations, or modifications to existing permits which emit toxic air contaminants (TAC). The emissions from the turbine are subject to Rule 1401, however, the emergency engine emissions are exempt.

For this modification, there is an increase in hourly emissions of toxic contaminants, due to the higher firing rate, but NO increase (or a slight decrease) in annual emissions, because the fuel use limit is being reduced. Therefore, the applicant was asked to perform an analysis for acute impacts only, since these are based on hourly emission rates, and chronic impacts and cancer risk impacts are based on annual emissions.

The applicant's modeling information was reviewed by AQMD modeling staff and the analyses were deemed acceptable based on the memo dated September 23, 2008. A summary of the modeling results is shown in the following table.

Results of Health Risk Assessment

Receptor	Previous HIA	Revised HIA
Residential	3.24E-03	5.16E-03
Off-site worker	3.42E-03	5.16E-03

The results show that the equipment can be expected to comply with the Rule 1401 thresholds.

*REGULATION XXX – Title V*

The SCE Etiwanda facility is subject to the Title V requirements because it is an Acid Rain facility [Rule 3001(c)(3)]. The modification proposed under these applications can be considered a minor permit revision because there is no increase in the average daily emissions of any criteria or hazardous air pollutant and there is no relaxation or major change to any term or condition of the permit. As a minor revision, the permit is subject to a 45 day review and comment period by the US EPA.

Federal Regulations

*NSPS for Stationary Gas Turbines - 40CFR Part 60 Subpart KKKK*

The turbine is subject to Subpart KKKK because the heat input is greater than 10.7 gigajoules per hour (10.14 MMBtu per hour) at peak load, based on the higher heating value of the fuel fired. Actual unit rating is 511.5E+06 btu/hr (HHV) X 1055 joules/btu = 539.6 gigajoules/hr. The standards applicable for a turbine between 50 mmbtu/hr and 850 mmbtu/hr are as follows:

NOx: 25 ppm at 15% O2

SOx: 0.90 lbs/MWh discharge, or 0.060 lbs/mmbtu potential SO2 in the fuel

Monitoring

The regulation requires that the fuel consumption and water to fuel ratio be monitored and recorded on a continuous basis, or alternatively, that a NOx and O2 CEMS be installed. For the SOx requirement, either a fuel meter to measure input, or a watt-meter to measure output is

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required, depending on which limit is selected. Also, daily monitoring of the sulfur content of the fuel is required if the fuel limit is selected. However, if the operator can provide supplier data showing the sulfur content of the fuel is less than 20 grains/100cf (for natural gas), then daily fuel monitoring is not required.

#### Testing

An initial performance test is required for both NOx and SO2. For units with a NOx CEMS, a minimum of 9 RATA reference method runs is required at an operating load of +/- 25 percent of 100 percent load. For SO2, either a fuel sample methodology or a stack measurement can be used, depending on the chosen limit. Annual performance tests are also required for NOx and SO2.

Compliance with the requirements of this rule is expected.

#### NESHAPS for Stationary Gas Turbines - 40CFR Part 63 Subpart YYYY

This regulation applies to gas turbines located at major sources of HAP emissions. A major source is defined as a facility with emissions of 10 tpy or more of a single HAP or 25 tpy or more of a combination of HAPs. The largest single HAP emission from the turbine or engine is formaldehyde from the turbine at 507 lbs/yr, or 0.22 tpy. The total combined HAPs from all sources at Mira Loma are less than 25 tpy (this was established under previous A/N 462003). Therefore, the Mira Loma facility is not a major source, and the requirements of this regulation do not apply.

#### 40 CFR Part 64 - Compliance Assurance Monitoring

The CAM regulation applies to emission units at major stationary sources required to obtain a Title V permit, which use control equipment to achieve a specified emission limit. The rule is intended to provide "reasonable assurance" that the control systems are operating properly to maintain compliance with the emission limits. The major source thresholds for the CAM rule, and the Mira Loma facility emissions are summarized as follows:

Table D-9 EPA Major Source Thresholds

Pollutant	Threshold (tpy)	Mira Loma Emissions (tpy)
VOC	10	1.2
NOx	10	3.9
SOx	100	0.2
CO	50	3.4
PM10	70	2.1

Since the facility is not a major source, the CAM regulations don't apply.

#### 40 CFR Part 72 - (Acid Rain Provisions)

The facility is subject to the requirements of the federal acid rain program, because the turbine is a utility unit greater than 25 MW. The acid rain program is similar to RECLAIM in that facilities are required to cover SO2 emissions with "SO2 allowances" that are similar in concept to RTCs. New facilities such as Mira Loma, are required to purchase SO2 credits on the open market to cover their annual SO2 releases, since there are no initial allowance allocations. The applicant is



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also required to monitor SO<sub>2</sub> emissions through use of fuel gas meters and gas constituent analyses, or, if fired with pipeline quality natural gas, as in the case of the Mira Loma facility, a default emission factor of 0.0006 lbs/mmbtu is allowed. SO<sub>2</sub> mass emissions are to be recorded every hour. NO<sub>x</sub> and O<sub>2</sub> must be monitored with CEMS in accordance with the specifications of Part 75. Under this program, NO<sub>x</sub> and SO<sub>x</sub> emissions will be reported directly to the U.S. EPA. Part 75 requires that the CEMS be installed and certified within 90 days of initial startup. Compliance is expected. Note that Section K of the permit will include the Acid Rain rule references applicable to this facility, specifically Part 72 and Part 73.

### **RECOMMENDATION:**

It's recommended that the following changes be incorporated into the permit:

1. Increase the limit on start up NO<sub>x</sub> from 7.66 lbs to 10.36 lbs
2. Include an exemption from BACT for emergency grid black out situations, with a new 28.3 lbs/hr NO<sub>x</sub> limit for those situations
3. Increase the allowable operating time for the emergency engine from 7 hours per year to 90 hours per year, including any emergency operation.
4. Change the permitted heat input from 423 mmbtu/hr to 511.5 mmbtu/hr
5. Change the permitted output from 45 MW to 49 MW
6. Increase the allowable start ups from 120/yr to 200/yr, and reduce the allowable annual fuel use from 490 mmcf/yr to 392 mmcf/yr
7. Include a 55 lbs/day NO<sub>x</sub> limit on the facility to insure the CEQA threshold will not be exceeded.
8. Include a NO<sub>x</sub> emission factor of 0.072 lbs/min to be used to calculate NO<sub>x</sub> during any CEMS calibration performed within the first hour of operation.
9. Define a shutdown in the language of condition A99.1 and A99.2
10. Specify that conditions A63.2 and A63.3 apply to the total facility emissions, and include factors to be used for the IC engine.
11. Include a requirement to record CEMS minute data during start up and shutdown periods.
12. Correct the engine hp rating from 865 to 924 in accordance with the inspectors report.

The permit to construct can be issued at the end of the 45 day EPA review and comment period, subject to the conditions as listed in the following section.

### **CONDITIONS:**

Note that the requirement for an initial source test under conditions D29.1 (turbine) and D29.4 (engine) have already been met, and there is no need for additional tests under this proposed modification. However the conditions will remain until final Permits to Operate are issued.

Proposed changes or additions are shown in **bold/underline**, proposed deletions are shown in ~~strikethrough~~



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## GAS TURBINE

A63.1 The operator shall limit emission from this equipment as follows:

CONTAMINANT	EMISSION LIMIT
NOx	2930 LBS IN ANY ONE MONTH
PM10	1637 LBS IN ANY ONE MONTH
CO	3778 LBS IN ANY ONE MONTH
SOx	94 LBS IN ANY ONE MONTH
VOC	542 LBS IN ANY ONE MONTH

THIS CONDITION APPLIES DURING THE COMMISSIONING MONTH ONLY.

The operator shall calculate the annual emission limit(s) by using fuel use data and the following emission factors: During commissioning with no control- NOx: 252.35 lb/mmcf; CO: 154.28 lbs/mmcf, VOC: 9.39 lb/mmcf; PM10: 11.03 lbs/mmcf, and SOx: 0.64 lb/mmcf. During commissioning with water injection- NOx: 103.42 lbs/mmcf, all other factors remain the same. During normal operation: VOC: 3.13 lbs/mmcf, PM10: 11.03 lbs/mmcf, and SOx: 0.64 lbs/mmcf.

~~Compliance with the NOx and CO emission limits shall be verified through CEMS data. If NOx and CO CEMS data is not available, NOx and CO emissions shall be calculated using fuel usage and the following factors NOx: 10.27 lb/mmcf and CO: 15.16 lbs/mmcf during normal operations, and NOx: 7.66 lbs/start, 6.44 lbs/shutdown, CO: 8.58 lbs/start, 7.69 lbs/shutdown.~~

**Compliance with the NOx and CO emission limits shall be verified through CEMS data. If CO CEMS data is not available, CO emissions shall be calculated using fuel usage and a factor of 15.16 lbs/mmcf during normal operations, 8.58 lbs/hr during any start up hour, and 7.69 lbs/hr during any shutdown hour. The operator shall use the appropriate missing data procedures if NOx data is not available.**

**If a CEMS calibration occurs within 60 minutes of a start up, NOx emissions for the calibration period shall be calculated using the actual duration of the calibration in minutes times a factor of 0.0792 lb/min, and shall only occur when NOx emissions are at or below BACT levels.**

[Rule 1303 – Offsets]



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A63.2 The operator shall limit emission from this equipment as follows:

CONTAMINANT	EMISSION LIMIT
NOx	1541 LBS IN ANY ONE MONTH
PM10	1462 LBS IN ANY ONE MONTH
CO	2008 LBS IN ANY ONE MONTH
SOx	82 LBS IN ANY ONE MONTH
VOC	381 LBS IN ANY ONE MONTH

THIS CONDITION APPLIES AFTER THE COMMISSIONING MONTH ONLY.

The operator shall calculate the annual emission limit(s) by using fuel use data and the following emission factors: VOC: 3.13 lbs/mmcf, PM10: 11.03 lbs/mmcf, and SOx: 0.64 lbs/mmcf.

Compliance with the NOx and CO emission limits shall be verified through CEMS data. If NOx and CO CEMS data is not available, NOx and CO emissions shall be calculated using fuel usage and the following factors: NOx: 10.27 lb/mmcf and CO: 15.16 lbs/mmcf during normal operations, and NOx: 7.66 lbs/start, 6.44 lbs/shutdown, CO: 8.58 lbs/start, 7.69 lbs/shutdown.

**Compliance with the NOx and CO emission limits shall be verified through CEMS data. If CO CEMS data is not available, CO emissions shall be calculated using fuel usage and a factor of 15.16 lbs/mmcf during normal operations, 8.58 lbs/hr during any start up hour, and 7.69 lbs/hr during any shutdown hour. The operator shall use the appropriate missing data procedures if NOx data is not available.**

**If a CEMS calibration occurs within 60 minutes of a start up, NOx emissions for the calibration period shall be calculated using the actual duration of the calibration in minutes times a factor of 0.0792 lb/min, and shall only occur when NOx emissions are at or below BACT levels.**

[Rule 1303 – Offsets]

A63.3 The operator shall limit emission from this equipment as follows:

CONTAMINANT	EMISSION LIMIT
NOx	5707 LBS IN ANY ONE YEAR
PM10	4411 LBS IN ANY ONE YEAR
CO	7728 LBS IN ANY ONE YEAR
SOx	254 LBS IN ANY ONE YEAR
VOC	1347 LBS IN ANY ONE YEAR

THIS CONDITION APPLIES DURING THE 1<sup>ST</sup> 12 MONTHS OF OPERATION ONLY, **and the limits apply to the total emissions from the turbine plus the engine.**



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The operator shall calculate the annual emission limit(s) by using fuel use data and the following emission factors **for the turbine**: During commissioning with no control- NOx: 252.35 lb/mmcf; CO: 154.28 lbs/mmcf, VOC: 9.39 lb/mmcf; PM10: 11.03 lbs/mmcf, and SOx: 0.64 lb/mmcf. During commissioning with water injection- NOx: 103.42 lbs/mmcf, all other factors remain the same. During normal operation- VOC: 3.13 lbs/mmcf, PM10: 11.03 lbs/mmcf, and SOx: 0.64 lbs/mmcf.

**The operator shall calculate the annual emission limit(s) by using hourly operation data and the following emission factors for the engine: NOx: 2.54 lbs/hr, CO: 3.56 lbs/hr, VOC: 0.92 lbs/hr, PM10: 0.064 lbs/hr, SOx: 0.0038 lbs/hr.**

Compliance with the NOx and CO emission limits shall be verified through CEMS data. If NOx and CO CEMS data is not available, NOx and CO emissions shall be calculated using fuel usage and the following factors- NOx: 10.27 lb/mmcf and CO: 15.16 lbs/mmcf during normal operations, and NOx: 7.66 lbs/start, 6.44 lbs/shutdown, CO: 8.58 lbs/start, 7.69 lbs/shutdown.

**Compliance with the NOx and CO emission limits shall be verified through CEMS data. If CO CEMS data is not available, CO emissions shall be calculated using fuel usage and a factor of 15.16 lbs/mmcf during normal operations, 8.58 lbs/hr during any start up hour, and 7.69 lbs/hr during any shutdown hour. The operator shall use the appropriate missing data procedures if NOx data is not available.**

**If a CEMS calibration occurs within 60 minutes of a start up, NOx emissions for the calibration period shall be calculated using the actual duration of the calibration in minutes times a factor of 0.0792 lb/min, and shall only occur when NOx emissions are at or below BACT levels.**

For the purpose of this condition, the yearly emission limit shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12 month period beginning on the first day of each calendar month.

[Rule 1303 – Offsets]

A63.4 The operator shall limit emission from this equipment as follows:

CONTAMINANT	EMISSION LIMIT
NOx	5716 5511 LBS IN ANY ONE YEAR
PM10	5403 4148 LBS IN ANY ONE YEAR
CO	7911 6415 LBS IN ANY ONE YEAR
SOx	311 218 LBS IN ANY ONE YEAR
VOC	1596 1233 LBS IN ANY ONE YEAR

**THIS CONDITION APPLIES AFTER THE 1<sup>st</sup> 12 MONTHS OF OPERATION, and the limits apply to the total emissions from the turbine plus the engine.**



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The operator shall calculate the annual emission limit(s) by using fuel use data and the following emission factors **for the turbine**: VOC: 3.15 lbs/mmcf, PM10: 11.19 lbs/mmcf, and SOx: 0.62 lbs/mmcf.

**The operator shall calculate the annual emission limit(s) by using hourly operation data and the following emission factors for the engine: NOx: 2.54 lbs/hr, CO: 3.56 lbs/hr, VOC: 0.92 lbs/hr, PM10: 0.064 lbs/hr, SOx: 0.0038 lbs/hr.**

The operator shall calculate the emission limit(s) and compliance with the NOx and CO emission limits shall be verified through CEMS data. If NOx and CO CEMS data is not available, NOx and CO emissions shall be calculated using fuel usage and the following factors: NOx: 10.42 lb/mmcf and CO: 15.14 lbs/mmcf during normal operations, and NOx: 7.66 lbs/start, 6.44 lbs/shutdown, CO: 8.58 lbs/start, 7.69 lbs/shutdown.

**Compliance with the NOx and CO emission limits shall be verified through CEMS data. If CO CEMS data is not available, CO emissions shall be calculated using fuel usage and a factor of 14.35 lbs/mmcf during normal operations, 8.58 lbs/hr during any start up hour, and 7.69 lbs/hr during any shutdown hour. The operator shall use the appropriate missing data procedures if NOx data is not available.**

**If a CEMS calibration occurs within 60 minutes of a start up, NOx emissions for the calibration period shall be calculated using the actual duration of the calibration in minutes times a factor of 0.0792 lb/min, and shall only occur when NOx emissions are at or below BACT levels.**

For the purpose of this condition, the yearly emission limit shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12 month period beginning on the first day of each calendar month.

[Rule 1303 – Offsets]

**A63.5 The operator shall limit emission from this equipment as follows:**

CONTAMINANT	EMISSION LIMIT
NOx	55 LBS IN ANY DAY

**The purpose of this condition is to ensure that the facility emissions are below the CEQA thresholds, and the limit is based on the total emissions from the turbine and the black start generator. The operator shall keep records on the NOx daily emissions. The operator shall keep records on the daily NOx emissions.**

[CEQA]

A99.1 The 2.5 PPM NOx emission limits shall not apply during commissioning, start-up, and shutdown periods, **and an emergency electrical grid system blackout when the turbine is used to re-start another major electric generating station.** Commissioning



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shall not exceed 25 hours total, with no more than 5 hrs uncontrolled and no more than 20 hrs with water injection. Each start-up shall not exceed 15 min. Each shutdown shall not exceed 10 min. There shall be no more than 60 start ups per year in the first year of operation, and ~~120~~ **200** start-ups per year thereafter. NO<sub>x</sub> emissions for the hour which includes a start shall not exceed ~~7.66~~ **10.36** lbs, and for the hour which includes a shutdown 6.44 lbs.

**In the case of a start during an emergency electrical grid system blackout, total NO<sub>x</sub> shall not exceed 28.23 lbs/hr.**

**In case of a turbine shutdown which occurs less than 75 minutes from a start up, the emissions calculated for the shutdown shall not include any of the first 15 minutes of the start up, and the emissions calculated for the start up shall not include any of the last 10 minutes of the shutdown.**

**A shutdown is defined as a reduction in turbine load ending in a period of zero fuel flow. The hour which includes a shutdown is defined as the 60 minutes counted back from the period of zero fuel flow.**

[Rule 1303(a) – BACT, Rule 1303(b)(1) – Modeling, Rule 1303(b)(2) - Offsets]

A99.2 The 6.0 PPM CO emission limits shall not apply during commissioning, start-up, and shutdown periods **and an emergency electrical grid system blackout when the turbine is used to re-start another major electric generating station.** Commissioning shall not exceed 25 hours total, with no more than 5 hrs uncontrolled and no more than 20 hrs with water injection. Each start-up shall not exceed 15 min. Each shutdown shall not exceed 10 min. There shall be no more than 60 start ups per year in the first year of operation, and ~~120~~ **200** start-ups per year thereafter. CO emissions for the hour which includes a start shall not exceed 8.58 lbs, and for the hour which includes a shutdown 7.69 lbs.

**In case of a turbine shutdown which occurs less than 75 minutes from a start up, the emissions calculated for the shutdown shall not include any of the first 15 minutes of the start up, and the emissions calculated for the start up shall not include any of the last 10 minutes of the shutdown.**

**A shutdown is defined as a reduction in turbine load ending in a period of zero fuel flow. The hour which includes a shutdown is defined as the 60 minutes counted back from the period of zero fuel flow.**

[Rule 1303(a) – BACT, Rule 1303(b)(1) – Modeling, Rule 1303(b)(2) - Offsets]

A195.1 The 2.5 PPMV NO<sub>x</sub> emission limit(s) is averaged over 60 minutes at 15 percent O<sub>2</sub>, dry.  
[Rule 1303(a) – BACT, Rule 1303(b)(1) – Modeling, Rule 1303(b)(2) - Offsets]

A195.2 The 6.0 PPMV CO emission limit(s) is averaged over 60 minutes at 15 percent O<sub>2</sub>, dry.  
[Rule 1303(a) – BACT, Rule 1303(b)(1) – Modeling, Rule 1303(b)(2) - Offsets]

A195.3 The 2.0 PPMV VOC emission limit(s) is averaged over 60 minutes at 15 percent O<sub>2</sub>, dry.  
[Rule 1303(a) – BACT, Rule 1303(b)(1) – Modeling, Rule 1303(b)(2) - Offsets]



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A195.5 The 25 PPMV NOX emission limit(s) is averaged over 4 hours rolling at 15 percent O2, dry.

[40 CFR60 Subpart KKKK]

A327.1 For the purpose of determining compliance with District Rule 475, combustion contaminants emissions may exceed the concentration limit or the mass emission limit listed, but not both limits at the same time.

[Rule 475]

D12.1 The operator shall install and maintain a(n) flow meter to accurately indicate the fuel usage being supplied to the turbine.

The operator shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

[Rule 1303(b)(2) – Offset]

C1.1 The operator shall limit the fuel usage to no more than 4.50 mmcf in any one day.

The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.

[Rule 1303(b)(2) – Offset]

C1.2 The operator shall limit the fuel usage to no more than 400 mmcf in any one year.

The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition and the records shall be made available upon AQMD request.

For the purpose of this condition, the yearly fuel use limit shall apply only during the 1<sup>st</sup> 12 months of operation.

[Rule 1303(b)(2) – Offset]

C1.3 The operator shall limit the fuel usage to no more than ~~490~~ 392 mmcf in any one year.

The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.

For the purpose of this condition, the yearly fuel use limit shall apply after the 1<sup>st</sup> 12 months of operation. The yearly emission limit shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12 month period beginning on the first day of each calendar month.

[Rule 1303(b)(2) – Offset]



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D29.1 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be tested	Required Test Method(s)	Averaging Time	Test Location
NOX emissions	District Method 100.1	1 hour	Outlet of the SCR
CO emissions	District Method 100.1	1 hour	Outlet of the SCR
SOX emissions	Approved District method	District approved averaging time	Fuel Sample
VOC emissions	Approved District method	1 hour	Outlet of the SCR
PM10 emissions	Approved District method	District approved averaging time	Outlet of the SCR
NH3 emissions	District method 207.1 and 5.3 or EPA method 17	1 hour	Outlet of the SCR

The test shall be conducted after AQMD approval of the source test protocol, but no later than 180 days after initial start-up. The AQMD shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine generating output in MW.

The test shall be conducted in accordance with AQMD approved test protocol. The protocol shall be submitted to the AQMD engineer no later than 45 days before the proposed test date and shall be approved by the AQMD before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at loads of 100, 75, and 50 percent.

For natural gas fired turbines only, VOC compliance shall be demonstrated as follows: a) Stack gas samples are extracted into Summa canisters maintaining a final canister pressure between 400-500 mm Hg absolute, b) Pressurization of canisters are done with zero gas analyzed/certified to contain less than 0.05 ppmv total hydrocarbon as carbon, and c) Analysis of canisters are per EPA Method TO-12 (with pre concentration) and temperature of canisters when extracting samples for analysis is not below 70 deg F.

The use of this alternative method for VOC compliance determination does not mean that it is more accurate than AQMD Method 25.3, nor does it mean that it may be used



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in lieu of AQMD Method 25.3 without prior approval except for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas fired turbines.

Because the VOC BACT level was set using data derived from various source test results, this alternate VOC compliance method provides a fair comparison and represents the best sampling and analysis technique for this purpose at this time. The test results shall be reported with two significant digits.

[Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset]

D29.2 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be tested	Required Test Method(s)	Averaging Time	Test Location
NH3 emissions	District method 207.1 and 5.3 or EPA method 17	1 hour	Outlet of the SCR

The test shall be conducted and the results submitted to the District within 45 days after the test date. The AQMD shall be notified of the date and time of the test at least 7 days prior to the test.

The test shall be conducted at least quarterly during the first twelve months of operation and at least annually thereafter. The NOx concentration, as determined by the CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable, a test shall be conducted to determine the NOx emissions using District Method 100.1 measured over a 60 minute averaging time period.

The test shall be conducted to demonstrate compliance with the Rule 1303 concentration limit

[Rule 1303(a)(1) – BACT]

D29.3 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be tested	Required Test Method(s)	Averaging Time	Test Location
SOX emissions	Approved District method	District approved averaging time	Fuel Sample
VOC emissions	Approved District method	1 hour	Outlet of the SCR
PM10 emissions	Approved District method	District approved averaging time	Outlet of the SCR

The test shall be conducted at least once every three years.



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The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine generating output in MW.

The test shall be conducted in accordance with AQMD approved test protocol. The protocol shall be submitted to the AQMD engineer no later than 45 days before the proposed test date and shall be approved by the AQMD before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at 100 percent load.

The test shall be conducted for compliance verification of the BACT VOC 2.0 ppmv limit.

For natural gas fired turbines only, VOC compliance shall be demonstrated as follows: a) Stack gas samples are extracted into Summa canisters maintaining a final canister pressure between 400-500 mm Hg absolute, b) Pressurization of canisters are done with zero gas analyzed/certified to contain less than 0.05 ppmv total hydrocarbon as carbon, and c) Analysis of canisters are per EPA Method TO-12 (with pre concentration) and temperature of canisters when extracting samples for analysis is not below 70 deg F.

The use of this alternative method for VOC compliance determination does not mean that it is more accurate than AQMD Method 25.3, nor does it mean that it may be used in lieu of AQMD Method 25.3 without prior approval except for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas fired turbines.

Because the VOC BACT level was set using data derived from various source test results, this alternate VOC compliance method provides a fair comparison and represents the best sampling and analysis technique for this purpose at this time. The test results shall be reported with two significant digits.

[Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset]

D82.1 The operator shall install and maintain a CEMS to measure the following parameters:

NOx and CO concentration in ppmv

Concentrations shall be corrected to 15 percent oxygen on a dry basis. The CEMS shall be installed and operating no later than 90 days after initial startup of the turbine, in accordance with an approved AQMD Rule 218 CEMS plan application. The operator shall not install the CEMS prior to receiving initial approval from AQMD.



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The CEMS will convert the actual NOx and CO concentrations to mass emission rates (lbs/hr) and record the hourly emission rates on a continuous basis.

The CEMS shall be installed and operated to measure the NOx and CO concentration over a 15 minute averaging time period.

The CEMS shall convert the actual CO concentrations to mass emission rates (lbs/hr) using the equation below and record the hourly emission rates on a continuous basis.

CO Emission Rate, lbs/hr =  $K * C_{co} * F_d [20.9 / (20.9\% - \%O_2 d)] [(Q_g * HHV) / 10E6]$ ,  
where

- K =  $7.267 * 10^{-8}$  (lbs/scf)/ppm
- C<sub>co</sub> = Average of 4 consecutive 15 min. average CO concentrations, ppm
- F<sub>d</sub> = 8710 dscf/MMBTU natural gas
- %O<sub>2</sub>, d = Hourly average % by volume O<sub>2</sub> dry, corresponding to C<sub>co</sub>
- Q<sub>g</sub> = Fuel gas usage during the hour, scf/hr
- HHV = Gross high heating value of the fuel gas, BTU/scf

[Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset]

E193.1 The operator shall upon completion of construction, operate and maintain this equipment according to the following specifications:

In accordance with all mitigation measures stipulated in the Negative Declaration prepared for this project (CEQA State Clearinghouse No. 2006121109).

[CEQA]

K40.1 The operator shall provide to the District a source test report in accordance with the following specifications:

Source test results shall be submitted to the District no later than 60 days after the source test was conducted.

Emission data shall be expressed in terms of concentration (ppmv) corrected to 15 percent oxygen (dry basis), mass rate (lb/hr), and lb/MMCF. In addition, solid PM emissions, if required to be tested, shall also be reported in terms of grains/DSCF. All exhaust flow rate shall be expressed in terms of dry standard cubic feet per minute (DSCFM) and dry actual cubic feet per minute. All moisture concentration shall be expressed in terms of percent corrected to 15 percent oxygen.

Source test results shall also include the oxygen levels in the exhaust, fuel flow rate (CFH), the flue gas temperature, and the generator power output (MW) under which the test was conducted.

[Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset]

K67.1 The operator shall keep records in a manner approved by the District, for the following parameter(s) or item(s):



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Commissioning hours and type of control and fuel use  
Date and time of each start-up and shutdown  
Natural gas fuel use after the commissioning period and prior to CEMS certification  
**CEMS minute data during start up and shutdown**

[Rule 1303(b)(2) - Offsets]

### BLACK START ENGINE

C1.4 The operator shall limit the operating time to no more than **7 90** hours per year.

The **7 90** hours per year *limit* may include up to  $\frac{1}{2}$  **64** hours per year operating time to maintain engine readiness or testing.

[Rule 1110.2, Rule 1304-Exemptions, Rule 1401]

D12.5 The operator shall install and maintain a non-resettable elapsed time meter to accurately indicate the elapsed operating time of the engine.

[Rule 1110.2, Rule 1304-Exemptions, Rule 1401]

K67.2 The operator shall keep records, in a manner approved by the District, for the following parameters or items:

Date of operation, the elapsed time, in hours, and the reason for operation. Records shall be kept and maintained on file for a minimum of two years and made available to district personnel upon request

[Rule 1110.2, Rule 1304-Exemptions, Rule 1401]

E162.1 The operator shall use this equipment only during utility failure periods, except for maintenance purposes.

[Rule 1110.2, Rule 1304-Exemptions, Rule 1401]

E193.2 The operator shall operate and maintain this equipment according to the following specifications:

The TA Luft carburetor settings shall be maintained at all times

[Rule 1303-BACT]



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### Appendix A

### Turbine Emission Calculations

Data:

Fuel Use Rate	0.4908	mmcf/hr
Fuel Use Daily Limit	4.5	mmcf/day
Fuel Use Annual Limit	392	mmcf/yr
Max Heat Input	511.5	mmbtu/hr
Calculated Max Exhaust	15.89	mmcf/hr

#### Normal Operation Emission Rates

Pollutant	Controlled Emission Rates	Source
NOX	4.82	Method 19
CO	7.04	Method 19
PM10	5.41	Previous factor X 20% higher fuel use
VOC	1.34	Method 19
SOx	0.0006	AP-42
NH3	5 ppm	Manufacturer

Example calculations:

NOx:

$\text{exhaust} = 0.4908 \text{ mmcf/hr} \times 1050 \text{ btu/cf} \times 8710 \text{ cf/mmbtu} \times 3.54 = 15.89 \text{ mmcf/hr}$   
 $\text{emissions} = 15.89 \text{ cf/hr} (2.5 \text{ ppm}) (46 \text{ lbs/lb-mol}) / 379 \text{ cf/lb-mol} = 4.82 \text{ lbs/hr}$

#### Start Up Emission Rates

Pollutant	Emission Rate (lbs/hr)	Source
NOX	10.36	Applicant
CO	8.66	Manufacturer
VOC	1.56	Manufacturer
PM10	5.41	Previous factor X 20% higher fuel use
SOx	0.31	AP-42



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**Shutdown Emission Rates**

Pollutant	Emission Rate (lbs/hr)	Source
NOX	6.44	Manufacturer
CO	7.77	Manufacturer
VOC	1.52	Manufacturer
PM10	4.51	Manufacturer
SOx	0.26	AP-42

Normal Operation Emissions  
Fuel Use = 0.4908 mmcf/hr

Pollutant	Uncontrolled Concentration	Controlled Concentration	Uncontrolled Emission Rate (lbs/hr)	Controlled Emission Rate (lbs/hr)	Uncontrolled Emission Factor (lbs/mmcf)	Controlled Emission Factor (lbs/mmcf)
NOX	63	2.5	126.00	4.82	256.72	9.82
CO	40	6.0	48.80	7.04	99.44	14.35
VOC	3.0	2.0	1.99	1.34	4.06	2.73
PM10			5.41	5.41	11.03	11.03
SOx			0.30	0.30	0.61	0.61
NH3	5.0	5.0	3.72	3.72	7.58	7.58

Daily Emissions  
Fuel Use = 4.5 mmcf/day

Pollutant	Uncontrolled Emissions lbs/day	Controlled Emissions lbs/day
NOX	1155.26	51.36
CO	447.47	66.92
VOC	18.26	12.70
PM10	49.62	49.62
SOx	2.75	2.75
NH3	34.11	34.11

Sample calculations:

Uncontrolled NOx:

$$4.5 \text{ mmcf/day} \times 256.72 \text{ lbs/mmcf} = 1155.26 \text{ lbs}$$

Controlled NOx:

$$10.36 \text{ lbs} + 6.44 \text{ lbs} + (4.5 \text{ mmcf} - 2 \times 0.4908 \text{ mmcf}) \times 9.82 \text{ lbs/mmcf} = 51.36 \text{ lbs}$$



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Controlled PM10:  
4.5 mmcf/day X 11.03 lbs/mmcf = 49.62 lbs

Monthly Emissions  
Fuel Use = 135 mmcf/month

Pollutant	Controlled Emissions 30 SU/SD
	lbs/month
NOX	1540.90
CO	2007.67
VOC	380.93
PM10	1461.57
SOx	81.68

Sample Calculation:

NOx:  
30(10.36 lbs) + 30(6.44 lbs) + 30(4.5 - 2\*0.49008 mmcf) X 9.82 lbs/mmcf = 1540.90 lbs

Annual Emissions  
Fuel Use = 392 mmcf/yr

	SU	SD	Normal
Hours	200	200	398.70
Fuel	98.16	98.16	195.68
NOX, lbs/hr	10.36	6.44	4.82
CO, lbs/hr	8.66	7.77	7.04
VOC, lbs/hr	1.56	1.52	1.34
PM10, lbs/hr	5.41	4.51	5.41
SOx, lbs/hr	0.31	0.26	0.26

Pollutant	SU	SD	Normal	Total
NOX	2072.00	1288.00	1922.28	5282.28
CO	1732.00	1554.00	2808.19	6094.19
VOC	312.00	304.00	534.89	1150.89
PM10	1082.40	902.00	2157.74	4142.14
SOx	62.40	52.00	103.66	218.06

Sample Calculation:

NOx:  
200(10.36) + 200(6.44) + 398.7(4.82) = 5282.28 lbs



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Appendix B

Engine Emission Calculations

DATA:

Engine HP 924  
Max heat input 6.43 mmbtu/hr  
Max fuel use 0.006 mmcf/hr (based on natural gas @ 1050 btu/cf)

Pollutant	Controlled Emission Rates		Source
NOx	1.25	g/bhp-hr	Vendor Guarantee
CO	1.75	g/bhp-hr	Vendor Guarantee
VOC	0.45	g/bhp-hr	Vendor Guarantee
PM10	9.91E-03	lbs/mmbtu	AP-42
SOx	5.88E-04	lbs/mmbtu	AP-42

Pollutant	Emissions	
	lbs/hr	lbs/yr*
NOx	2.54	228.96
CO	3.56	320.55
VOC	0.92	82.43
PM10	0.0637	5.73
SOx	0.0038	0.34

\*Annual emissions based on 90 operating hours per year, which includes up to 64 hours/yr for maintenance and testing as requested by the applicant.



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Appendix C

Total Facility Emissions

Pollutant	Turbine	Black Start Engine	370 HP Diesel Engine	1490 HP Diesel Engine	Fuel Dispensing	Total	TPY
NOX	5282.28	228.96	790.53	1444.05	0	7745.82	3.87
CO	6094.19	320.55	302.52	170.66	0	6887.92	3.44
VOC	1150.89	82.43	15.16	72.20	1039	2359.68	1.18
PM10	4142.14	5.73	12.22	26.26	0	4186.35	2.09
SOx	218.06	0.34	15.00	60.39	0	293.79	0.15



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Appendix D

Toxic Emissions

Emissions of toxics are calculated using the latest factors from EPA, except for ammonia which is calculated using the manufacturer guarantee of 5 ppm slip rate. Turbine maximum heat input is provided by the applicant as 511.5 mmbtu/hr. Hourly toxic emissions are increasing from the previous application, but the annual emissions will remain the same or be reduced because the annual fuel limit will be reduced from 490 mmcf/yr to 392 mmcf/yr.

Pollutant	AP-42 Emission Factor (lb/mmbtu)	Current Maximum Hourly Emission Rate (lb/hr)	Proposed Maximum Hourly Emission Rate (lb/hr)	Current Annual Emission (lbs/yr)	Proposed Annual Emissions (lb/yr)
1,3 Butadiene	4.30E-07	1.82E-04	2.20E-04	3.12E-01	1.76E-01
Acetaldehyde	4.00E-05	1.69E-02	2.05E-02	2.90E+01	1.63E+01
Acrolein	6.40E-06	2.70E-03	3.27E-03	4.65E+00	2.61E+00
Benzene	1.50E-05	6.34E-03	7.67E-03	1.09E+01	6.13E+00
Ethylbenzene	3.20E-05	1.35E-02	1.64E-02	2.32E+01	1.31E+01
Formaldehyde	7.10E-04	3.00E-01	3.63E-01	5.15E+02	2.90E+02
Naphthalene	1.30E-06	5.50E-04	6.65E-04	9.44E-01	5.31E-01
PAH	2.20E-06	9.30E-04	1.13E-03	1.60E+00	8.99E-01
Propylene Oxide	2.90E-05	1.23E-02	1.48E-02	2.11E+01	1.18E+01
Toluene	1.30E-04	5.50E-02	6.65E-02	9.44E+01	5.31E+01
Xylene	6.40E-05	2.70E-02	3.27E-02	4.65E+01	2.61E+01
Ammonia	N/A	3.10E+00	3.72E+00	5.25E+03	2.97E+03

Sample Calculation

Proposed Hourly Benzene:  $1.50E-05 \text{ lbs/mmbtu} \times 511.5 \text{ mmbtu/hr} = 7.67E-03 \text{ lbs/hr}$

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## Appendix E

### Modeling

Modeling was been performed for Rule 1303 (1 hour NO<sub>2</sub>, 1 and 8 hour CO, and 1 hour and 3 hour SO<sub>2</sub>) and Rule 1401 (Acute Hazard Index) to evaluate the health risks of the proposed project. For NO<sub>2</sub>, modeling was performed for 3 scenarios: 1) a typical 12 minute start, 2) a 40-minute grid blackout start, and 3) normal operation. For all other pollutants, modeling was performed for a normal operating scenario only.

Following tables briefly summarize the emission rates and stack parameters that were used in the modeling, and the results of the modeling.

#### Stack Parameters Normal Operation

Parameter	Mira Loma Turbine
Stack Dia, m	3.96
Stack Ht, m	24.38
Stack Temp, deg K	627
Stack Velocity, m/s	18.3

#### Emission Rates Normal Operation

Pollutant	Averaging	Mira Loma Turbine Emissions (g/s)
NO <sub>2</sub>	1-hour	0.631
CO	1-hour	0.931
	8-hour	0.931
SO <sub>2</sub>	1-hour	0.038
	3-hour	0.038

#### Stack Parameters Start Up Operation

Parameter	Mira Loma Turbine
Stack Dia, m	3.96
Stack Ht, m	24.38
Stack Temp, deg K	627
Stack Velocity, m/s	17.2



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Emission Rates Start Up Operation

Scenario	Averaging	Mira Loma Turbine Emissions (g/s)
12 minute start	NO2 1-hour	1.31
40 minute start	NO2 1-hour	3.56

Toxic Emission Rates

Pollutant	Mira Loma Turbine Emissions (g/s)
1,3 Butadiene	2.77E-05
Acetaldehyde	2.58E-03
Acrolein	4.13E-04
Benzene	9.68E-04
Ethylbenzene	2.06E-03
Formaldehyde	4.58E-02
Naphthalene	8.39E-05
PAH	1.42E-04
Propylene Oxide	1.87E-03
Toluene	8.39E-03
Xylene	4.13E-03
Ammonia	3.69E+00

Mira Loma Criteria Model Results Normal Operation

Pollutant	Averaging Period	Maximum Predicted Impact (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)
NO2	1-hour	3.20	189.82	193.03
CO	1-hour	4.73	4347.87	4352.60
	8-hour	1.93	3352.43	3354.36
SO2	1-hour	0.19	62.81	63.01
	3-hour	0.15	31.41	31.55

Start Up Model Results (NO2 – 1 hour)

Site/Scenario	Maximum Predicted Impact (ug/m3)	Background Concentration (ug/m3)	Total Concentration (ug/m3)
Mira Loma/12 min	7.0	189.82	196.82
Mira Loma/40 min	19.1	189.82	208.92



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**HIA Results**

**Grapeland HIA**

5.16E-03



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### Appendix F

#### Application Fee Summary

A/N	Equipment	Submittal Date	Deemed Complete	BCAT/CCAT	Schedule	Base Fee <sup>(1)</sup>	XPP Fee	Total Filing Fees
478600	LM6000 Gas Turbine	2/28/08	4/4/08	13008	D	\$4,071.37	\$2,035.69	\$6,107.06
479361	Emergency Engine	3/19/08	4/4/08	43902	B	\$1,865.02	\$932.51	\$2,797.53
478601	TV Permit Revision	2/28/08	4/4/08	555007	-	\$767.09	-	\$767.09
							Total	\$9,761.68

