

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 20	PAGE 1
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY <i>GA</i>

PERMIT(S) TO CONSTRUCT/OPERATE EVALUATION
(Alteration/modification to previous PCs by increase in heat input rate)

APPLICANT'S NAME: SUNSHINE GAS PRODUCERS, L.L.C.

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FACILITY ID: 139938

EQUIPMENT DESCRIPTION:

A/N 577285:

Resource Recovery/Landfill Gas-to-Energy System consisting of:

1. Pretreated Landfill Gas (LFG) Supply.
2. Gas Turbine, No. 5, Solar, Mercury 50, landfill gas (LFG) fired, 61.0 mmBTU/hr, driving a nominal 4.9 megawatt (MW) electric generator.
3. Exhaust Stack, 4'- 7" Dia. X 26' - 6" high.

A/N 577286:

Resource Recovery/Landfill Gas-to-Energy System consisting of:

1. Pretreated Landfill Gas (LFG) Supply.
2. Gas Turbine, No. 4, Solar, Mercury 50, landfill gas (LFG) fired, 61.0 mmBTU/hr, driving a nominal 4.9 megawatt (MW) electric generator.
3. Exhaust Stack, 4'- 7" Dia. X 26' - 6" high.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 20	PAGE 2
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

A/N 577287:

Resource Recovery/Landfill Gas-to-Energy System consisting of:

1. Pretreated Landfill Gas (LFG) Supply.
2. Gas Turbine, No. 3, Solar, Mercury 50, landfill gas (LFG) fired, 61.0 mmBTU/hr, driving a nominal 4.9 megawatt (MW) electric generator.
3. Exhaust Stack, 4'- 7" Dia. X 26' - 6" high.

A/N 577288:

Resource Recovery/Landfill Gas-to-Energy System consisting of:

1. Pretreated Landfill Gas (LFG) Supply.
2. Gas Turbine, No. 2, Solar, Mercury 50, landfill gas (LFG) fired, 61.0 mmBTU/hr, driving a nominal 4.9 megawatt (MW) electric generator.
3. Exhaust Stack, 4'- 7" Dia. X 26' - 6" high.

A/N 577289:

Resource Recovery/Landfill Gas-to-Energy System consisting of:

1. Pretreated Landfill Gas (LFG) Supply.
2. Gas Turbine, No. 1, Solar, Mercury 50, landfill gas (LFG) fired, 61.0 mmBTU/hr, driving a nominal 4.9 megawatt (MW) electric generator.
3. Exhaust Stack, 4'- 7" Dia. X 26' - 6" high.

Conditions:

1. Operation of this equipment shall be conducted in compliance with all data and specifications submitted with the application under which this permit is issued, unless otherwise noted below.
[Rule 204]
2. This equipment shall be properly maintained and kept in good operating condition at all times.
[Rule 204]
3. This equipment shall be operated by personnel properly trained in its operation.
[Rule 204]
4. This equipment shall be fired only with landfill gas except when propane is used to ignite the turbine during start-up.
[Rule 204]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 20	PAGE 3
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

5. A continuous flow indicating and recording device shall be installed and maintained in the landfill gas supply line to the gas turbine to measure and record the quantity of landfill gas (in scfm) supplied.
[Rule 1303(b) (1)-Modeling, 1303(b) (2)-Offset, 3004(a) (4)]
6. The total heat input of landfill gas burned in the gas turbine shall not exceed 61.0 mmBTU/hr (HHV), based on a 24 -hour average. The operator shall monitor the total heat input rate of the landfill gas on a continuous basis. The owner or operator of this equipment shall install and maintain a remote notification system to notify the facility if an exceedance of 61.0 mmBTU/hr limit occurs.
[Rule 1303(b) (1)-Modeling, 1303(b) (2)-Offset, 3004(a) (4), Rule 1401]
7. If any of the five gas turbines has a total heat input rate of 57.7 mmBTU/hr (HHV) or greater, based on a 24-hour average, from the combustion of landfill gas, then the operator shall conduct landfill gas sulfur monitoring as outlined in the table below.

The colorimetric tubes (Tubes) for analyzing H₂S as TS shall be used in accordance with manufacturer's instructions. Testing with Tubes shall be conducted by personnel properly trained in its operation. The Tubes shall be used within their shelf life. The concentration of TS in the landfill gas (as measured by the Tubes), shall be used to determine the action level, monitoring tier, and sampling requirements as shown below.

Action Level	Monitoring Tiers	Sampling Requirements
Tier I	TS < 95	- Quarterly using Method 307-91 - Monthly using Tubes
Tier II	95 ≤ TS < 114	- Monthly using Method 307-91 - Weekly using Tubes
Tier III	114 ≤ TS < 123	- Weekly using Method 307-91 - Daily using Tubes
Tier IV	TS ≥ 123	- Potential Rule 1303-BACT violation for daily SO _x emission exceedance. - Follow Reporting Provisions listed under Section K-Title V Administration - Daily using Method 307-91

[Rule 1303(a) (1)-BACT]

(Continued on next page)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES	PAGE
	20	4
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

8. If all of the five gas turbines have less than a total heat input rate of 57.7 mmBTU/hr (HHV), based on a 24-hour average, from the combustion of landfill gas, then the operator shall conduct landfill gas sulfur monitoring as outlined in the Sunshine Canyon Landfill (Facility Id 49111) Rule 431.1 Alternative Monitoring Plan (A/N 291681) and as shown in the table below.

The colorimetric tubes (Tubes) for analyzing H₂S as TS shall be used in accordance with manufacturer's instructions. Testing with Tubes shall be conducted by personnel properly trained in its operation. The Tubes shall be used within their shelf life. The concentration of TS in the landfill gas (as measured by the Tubes), shall be used to determine the action level, monitoring tier, and sampling requirements as shown below.

Action Level	Monitoring Tiers	Sampling Requirements
Tier I	TS < 100	- Quarterly using Method 307-91 - Monthly using Tubes
Tier II	100 ≤ TS < 120	- Monthly using Method 307-91 - Weekly using Tubes
Tier III	120 ≤ TS < 130	- Weekly using Method 307-91 - Daily using Tubes
Tier IV	TS ≥ 130	- Potential Rule 1303-BACT violation for daily SO _x emission exceedance. - Follow Reporting Provisions listed under Section K-Title V Administration - Daily using Method 307-91

[RULE 1303(a) (1)-BACT]

9. The operator shall synchronize all recording devices with respect to the time of day.
[Rule 204]
10. The operator shall direct all landfill gas which is not burned in this equipment to another combustion or processing facility which is in full use, and can adequately process the volume of gas collected and which has been issued a valid permit by the SCAQMD.
[Rule 1303(a) (1)-BACT]
11. The operation of this equipment shall not result in the release of raw landfill gas into the atmosphere. Any breakdown or malfunction which results in emission of landfill gas shall be reported to the SCAQMD within one hour after occurrence or within one hour of the time the operating personnel knew or reasonably should have known of the occurrence and, immediate remedial measures shall be undertaken to correct the problem and prevent further emissions into the atmosphere.
[Rule 402, 430]
12. The operator shall install and maintain an adequate number of sampling ports and welded nipples with caps in the exhaust stack and provide safe access to these sampling ports in accordance with Rule 217 and SCAQMD approval.
[Rule 217]
13. A continuous combustion temperature monitoring and recording system shall be maintained, to determine exhaust temperature of last power turbine (T7) and calculate the combustion chamber temperature (TPZ) per manufacturer's recommendations, pursuant to the operation and maintenance requirements specified in 40 CFR Part 64.7. Such a system shall have an accuracy of within ± 1% of the temperature being monitored

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 20	PAGE 5
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

and shall be inspected, maintained, and calibrated on an annual basis in accordance with the manufacturer's specifications using an applicable SCAQMD or EPA approved method.
[40 CFR 64]

14. The combustion chamber temperature of last power turbine (T7) shall be recorded at least every 15 minutes, and the hourly average shall be computed from such data points. The operator shall review the records of temperature on a daily basis to determine if a deviation occurred or shall install an alarm system to alert the operator when a deviation occurs.
[40 CFR 64]
15. All deviations shall be reported to the SCAQMD on a semi-annual basis pursuant to the requirements specified in 40 CFR 64.9 and condition nos. 22 and 23 in Section K of this permit. For the purpose of this condition, a deviation shall be defined as when the last power turbine (T7) exhaust temperature is less than 1100 degrees Fahrenheit or greater than 1300 degrees Fahrenheit, or as otherwise approved by SCAQMD, occurs averaged over one hour during operation, except during start up and shutdown events lasting for a maximum of one hour. Multiple start up and shutdown events can occur consecutively.
[40 CFR 64]
16. For each semi-annual reporting period specified in condition no. 23 in Section K, whenever a deviation occurs from the temperature, the operator shall take immediate corrective action, and keep records of the duration and cause (including unknown cause, if applicable) of the deviation and the corrective action taken.
[40 CFR 64]
17. A semi-annual monitoring report shall be submitted to SCAQMD, which shall include but may not be limited to the total operating time of this equipment and the total accumulated duration of all deviations for each semi-annual reporting period.
[40 CFR 64]
18. The owner or operator shall submit an application with a Quality Improvement Plan (QIP) in accordance with 40 CFR Part 64.8 to the SCAQMD if an accumulation of deviations exceeds 5% duration of this equipment's total operating time for any semi-annual reporting period specified in condition no. 23 in Section K of this permit. The required QIP shall be submitted to the SCAQMD within 90 calendar days after the due date of the semi-annual monitoring report.
[40 CFR 64]
19. The operator shall install, maintain, and operate a Continuous Emission Monitoring System (CEMS), which is approved by the Executive Officer, to measure the exhaust concentration for NO_x and O₂, on a dry basis. In addition, the system shall convert the actual NO_x concentration to a corrected NO_x concentration at 15% O₂, dry, and results shall be continuously recorded.
[Rule 218, 1303(b) (1) Modeling, 1303(b) (2)-Offset, 3004(a) (4)]
20. The operator shall conduct annual performance tests (within 45 days of anniversary of initial test), at maximum achievable load, in accordance with the approved test procedures. Written results of such performance tests shall be submitted within 60 days after testing. Notice shall be provided to the SCAQMD 10 days prior to the testing so that an observer may be present. All source testing and analytical methods shall be submitted to the SCAQMD for approval at least 30 days prior to start of the tests. The tests shall include, but may not be limited to, a test of the inlet landfill gas and the gas turbine exhaust for:
 - A. Methane and Total Non-Methane Hydrocarbons (TNMHC)
 - B. Carbon Monoxide (Exhaust Only)
 - C. Oxides of Nitrogen (Exhaust Only)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES	PAGE
	20	6
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

- D. Carbon Dioxide
- E. Particulate Matter/PM10 (Exhaust Only)
- F. C1 through C3 Sulfur Compounds and Total Reduced Sulfur, as H2S (Speciated, Inlet Only)
- G. Toxic Air Contaminants (TAC) including, but not limited to, Benzene, Chlorobenzene, 1, 2-Dichloroethane, 1, 1-Dichloroethene, Dichloromethane, Tetrachloroethylene, Tetrachloromethane, Toluene, 1, 1, 1-Trichloroethane, Trichloroethylene, Trichloromethane, Vinyl Chloride, and Xylene Isomers
- H. Hydrochloric Acid (Exhaust Only)
- I. Oxygen and Nitrogen
- J. Moisture Content
- K. Temperature
- L. Flow Rate
- M. Volatile Organic Compounds (VOC) Control Efficiency, wt. % (based on inlet and exhaust VOC)
- N. kW Generated.

The report shall also present the emissions data in units of pounds per hour (lb/hr), pounds per million BTU (lb/mmBTU), and parts per million (ppmv) on a dry basis at 15% O2 (CO, NOx, TNMHC, and TAC), and the gas turbine's overall TNMHC destruction efficiency (wt. %). Total Particulate/PM10 shall be reported in gr/scf and lbs/hr. The report shall project the total daily SO2 and HCl emissions based on the test results. In addition, the report shall provide gas turbine's demonstrated efficiency at full load, in BTU/kW-hr, corrected to the higher heating value (HHV) of the fuel.

[Rule 1303 (a) (1)-BACT, 1303(b) (1)-Modeling, 1303(b) (2)-Offset, 1150.1, 1401, 3004 (a) (4), 40 CFR Part 60 Subpart WWW]

21. Emissions from the gas turbine shall not exceed the following:

Contaminant	lbs/day
CO	78.3
NOx (as NO2)	74.8
PM10	17.3
TNMOC (as CH4)	21.9
SOx (as SO2)	74.6

[Rule 1303(b) (1)-Modeling, 1303(b) (2)-Offset]

22. Emission of oxides of nitrogen shall not exceed 12.5 ppmv, calculated at 15% O2, dry basis, except during periods of startup and shutdown not to exceed 30 minutes per incident.
[Rule 1303 (a) (1)-BACT, 1303(b) (1)-Modeling, 1303(b) (2)-Offset]
23. Emission of carbon monoxide shall not exceed 21.5 ppmv, calculated at 15% O2, dry basis, except during periods of startup and shutdown not to exceed 30 minutes per incident.
[Rule 1303 (a) (1)-BACT, 1303(b) (1)-Modeling, 1303(b) (2)-Offset]
24. All records shall be kept for a period of at least five years and shall be made available to SCAQMD personnel upon request.
[Rule 3004 (a) (4)]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 20	PAGE 7
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

Emissions and Requirements:

This equipment is subject to the applicable requirements of the following rules and regulations.

- 25. CO: 2000 ppmv, dry, 15 min. avg., Rule 407
- CO: 21.5 ppmv, @ 15% O2, Rule 1303-BACT/LAER
- NOx: 12.5 ppmv, @ 15% O2, Rule 1303-BACT/LAER
- NOx: 96 ppmv, @ 15% O2, dry, or 5.5 lb/MWh, NSPS, 40CFR60 Subpart KKKK
- PM: Combustion Contaminant, 0.1 grain/dscf of gas, calculated @ 12% CO2, averaged over 15 consecutive minutes, Rule 409.
- NMOC: 10.5 ppmv, @ 15% O2, as methane, Rule 1303-BACT/LAER
- NMOC: 20 ppmv, as hexane, @ 3% O2, dry OR 98% (by wt.) destruction efficiency, Rule 1150.1, 40 CFR60 Subpart WWW, 40 CFR 63 Subpart AAAA.
- SOx: Based on maximum 150 ppmv H2S con. in LFG, Rule 431.1
- SOx: Facility wide total SOx emission shall not exceed 379.6 lbs/day, from five gas turbines and a regeneration flare.
- SOx: 0.90 lb/MWh or 0.15 lb/mmBTU, NSPS, 40 CFR 60 Subpart KKKK.
- SOx: 0.2% Rule 53

BACKGROUND AND HISTORY:

On August 7, 2015, Sunshine Gas Producers, LLC (SGP) submitted for expedited permit processing (XPP) the above five applications (577285 through 577289) for change of condition for the existing gas turbines to increase LFG fuel heat input rate limit from 48.1 MMBTU/HR to 61.0 MMBTU/HR for each of the five identical gas turbines. Although, there is no physical change or alteration of the equipment, increase in permitted heat input rate (approx. by 27%) will cause change in maximum design capacity and increase in air pollutants' emissions rates. Therefore, per Rule 301 (b) (1) definition, these applications are considered as an alteration or modification. The applicant has proposed a change in criteria pollutants' exhaust concentrations and emission rates.

The correct amount of fees were submitted for alteration/modification.

A/N 577290 was also filed on August 7, 2015 for Title V permit revision to include the above permit units into the Title V facility permit upon respective permit approval.

Applications:

<u>Application #</u>	<u>Equipment</u>	<u>Current PC</u> 04/08/2015	<u>Initial PC</u> 04/27/2012
577289	Gas Turbine #1	571762	480567
577288	Gas Turbine #2	571763	480568
577287	Gas Turbine #3	571764	480569
577286	Gas Turbine #4	571767	480570
577285	Gas Turbine #5	571765	480571

Gas combustion turbine(s) operations were started on July 21, 2014 (construction completion on September 1, 2014). No facility wide annual emission rates available.

A June 30, 2015 Title V inspection report indicated that equipment were operating in compliance. The gas turbines were source tested January 12-16, 2015. The source test for the regeneration flare was conducted,

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES	PAGE
	20	8
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

however, due to deficiencies concerning the sampling location(s) and/or representativeness with respect to the process and required testing, the flare was re-tested, pending compliance determination.

On July 2, 2015, SGP filed a short variance, Case No. 5880-3, to seek relief from facility-wide permitted heat input rate of 247 MMBTU/HR. and permitted heat input rate limit of 48.1 MMBTU/HR for each of the gas turbines. Subsequently, SGP submitted the above applications for modifications to increase the respective heat input rate limits. SGP informed Clerk of the Board (letter dated January 15, 2016) that SGP has fulfilled all requirements of this variance and is in compliance with the variance conditions.

The most recent Title V Revision permit was issued April 9, 2015.

Proposed change of conditions-Modification:

SGP had recently noticed the discrepancy for rated heat input for the gas turbines and the actual in field fuel usage. In order to resolve discrepancy and operate equipment in compliance, SGP has determined to increase the permitted heat input rate for each gas turbine.

SGP facility has proposed following changes to each of the existing gas turbine permits;

- Increase heat input rate from 48.1 to 61.0 MMBTU/HR.
- Revise exhaust concentration limits (reduced) for NOx, CO and NMOC to avoid BACT threshold.
- Revise/impose daily emission rates for the applicable criteria pollutants' rates to avoid BACT threshold.
- Revise facility wide limit for total LFG processed at this facility, MMBTU/HR.
- Revise facility wide total SOx emission, as SO2 limit, lbs/day (by LFG fuel sulfur monitoring requirement conditions and to avoid potential BACT requirement).

Note: Revised above permit conditions #6, #18, #20, #21, #22, #23, and #25.
Added new conditions #7 and #8.

EMISSIONS:

Pollutant	Proposed Concentration ppmvd @ 15% O2, (unless otherwise noted)	Existing PC Con. limit ppmvd @ 15% O2
NOx	12.5	15
CO	21.5	25
TNMOC, as methane	10.5	-
TNMOC, as hexane	20.0 ppmv@ 3% O2	20.0 ppmv@ 3% O2
SOx, as SO2	Monitor emission through daily or weekly testing of fuel total sulfur, as H2S, and regulating inlet fuel flow rate (such that the daily SOx emissions for each turbine do not exceed <u>74.6 lbs/day (a 0.9 lbs/day increase from previous permit evaluation of 73.7 lbs/day)</u> , to avoid triggering BACT (Initial PCs under A/N 480567- 480571).	

Revised Heat input rate	61.0 MMBTU/HR (HHV @ 470 Btu/scf) = 1.0166 MMBTU/min
	54.9 MMBTU/HR (LHV @ 423 Btu/scf), assumed to be 90% of HHV)
Exhaust oxygen	15% O2
Exhaust moisture	5%

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES	PAGE
	20	10
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

61mmBTU/hr @ 470 BTU/scf → 2163 scfm LFG

Current Rule 431.1 Schedule

		TS (H2S) to Total Sulfur Conversion	Percentage Breakdown for Monitoring Frequency
TS < 100	Quarterly Lab, Monthly Tube	100 TS (H2S) = 115 Total Sulfur	100/130 = 76.9%
100 ≤ TS < 120	Monthly Lab, Weekly Tube	120 TS (H2S) = 138 Total Sulfur	120/130 = 92.3%
120 ≤ TS < 130	Weekly Lab, Daily Tube	130 TS (H2S) = 150 Total Sulfur	
130 ≤ TS	Daily Lab, Notify SCAQMD		

130 TS (H2S*) = 150 Total Sulfur → (86.7% H2S)

* H2S measured by colorimetric tubes.

Proposed Rule 431.1 Schedule for BACT Compliance

		TS (H2S) to Total Sulfur Conversion	Percentage Breakdown for Monitoring Frequency
TS < 95	Quarterly Lab, Monthly Tube	95 TS (H2S) = 110 Total Sulfur	95/123 = 76.9%
95 ≤ TS < 114	Monthly Lab, Weekly Tube	114 TS (H2S) = 131 Total Sulfur	114/123 = 92.3%
114 ≤ TS < 123	Weekly Lab, Daily Tube	123 TS (H2S) = 142 Total Sulfur	
123 ≤ TS	Daily Lab, Notify SCAQMD		

123 TS (H2S) = 142 Total Sulfur → (86.7% H2S)

Emissions Summary: (Each Gas Turbine)

Pollutant Lbs/day	Pre-modification Lbs/day	Post-modification Lbs/day	Net increase
NOx	76.5	74.8	-1.7
CO	77.6	78.3	0.7
TNMOC as CH4	21.1	21.9	0.8
SOx, as SO2	73.7	74.6	0.9
PM10	17.3	17.3	0

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 20	PAGE 11
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

Note: The SGP application submittal emission estimates for each gas turbine were 67.8 lbs SOx/day ~ 2.9 lbs SOx/hr based on SGP's Regen flare study. These estimates were not used; instead the previous permitted emissions were used as the pre-modification emissions per current permitting practice.

Total Emissions from 5 Gas Turbines: (Post-modification)

Pollutant	Lbs/day	Tons/yr
NOx	374	68.26
CO	391.5	71.45
VOC *	109.5	19.98
SO2	373	68.07
PM10/PM2.5	86.5	15.79

AEIS / NSR: (Post-modfn.)

Pollutant	Lbs/hr
	R1 = R2
NOx	3.12
CO	3.26
VOC *	0.91(R2), 45.5* (R1)
SO2	3.11
PM10	0.72

*R1 estimated assuming 98% DRE for VOC

(Continued on next page)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES	PAGE
	20	12
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

January 12-16, 2015 Summary of Performance Source Tests Results:

Source Tests Results: Summary, ST Date: January 12-16, 2015, ST/ID PR 14466

Solar, each Mercury 50, LFG fired gas turbine (5, Identical), each driving a 4.9 MW generator

Rated Heat Input Capacity = 48.1 MMBTU/hr, each.

LFG Btu/scf, HHV= 475 avg.

F-Factor, dscf/MMBTU = 9480-9503

Jan 2015 SOURCE TESTS	GT 1 480567	GT 2 480568	GT 3 480569	GT 4 480571	GT 5 480572
LFG flow rate to GT, scfm	1706	1704	1672	1733	1743
Total Heat Input, MMBTU/hr	48.83	48.77	47.25	48.87	50.09
Exhaust flow rate, dscfm	32,390	32,691	31,600	32,645	33,621
Exhaust, % O2	15.92	15.97	15.95	14.95	15.98
Exhaust temperature, deg. F, Avg.					
CO, ppmv @15% O2+	2.37	2.33	2.38	2.38	2.40
CO, lbs/hr	0.287	0.289	0.280	0.289	0.298
NOx, ppmv @ 15% O2	5.63	5.86	5.69	5.11	4.96
NOx, lbs/hr	1.12	1.17	1.10	1.02	1.01
Lb NOx/MMBTU	0.023	0.0239	0.0233	0.0209	0.0202
TNMOC, ppmv (as CH4), inlet					
TNMOC, lb/hr, Exhaust	0.19	0.364	1.71	1.30	8.21
TNMOC, ppmv @ 3% O2, as hexane	2.55	3.24	0.90	2.60	2.60
TNMOC, % DRE					
TRS as H2S, ppmv	100	117	100	107	129
Cal. SO2, lbs/hr					
Formaldehyde, lbs/hr, Run 1	0.00049	0.0037	0.0031	0.0007	0.0009
PM=PM10, gr/dscf	0.0006	0.0004	0.0005	0.0004	0.0027
PM=PM10, lb/hr	0.15	0.11	0.13	0.10	0.77
Acetaldehyde, lb/hr, Run 1	0.00173	0.0022	0.0026	0.0023	0.009

+ Actual CO values can only be for compliance determinations, not emission calculations.

RULES EVALUATION: (From PC evaluation with changes as applicable)

RULE 212: There is no school within 1000' from the emission source. Post modification emission increase is below daily threshold in R212 (g). Facility wide risk is expected less than 10 in a million. No public notice is required
Compliance is expected.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 20	PAGE 13
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

RULE 218: CEMS exempt per Rule 218 (b) (1), as equipment is subject to Reg. IX – NSPS. However, permit condition requires installation and operation of approved CEMS by the SCAQMD. Annual RATA notification for each of five CEMS is received by SCAQMD; and RATA testing was scheduled for August 31 - September 4, 2015 (Horizon air measurement email, 8/17/15).

RULE 401: With proper operation, control and maintenance, equipment is expected to comply with this rule.

RULE 402: With proper operation, control and maintenance nuisance complaints are not expected from each GT and flare operation.

RULE 404: Gas turbine is exempt from provisions of this rule, per 404 (c).

RULE 407: Compliance is expected with the 2000 ppmv CO limit. Gas turbine is subject to Regulation XI and complies with gaseous fuel sulfur limit of Rule 431.1. Therefore, exempt from SOx 500-ppmv limit, per 407(c) (2).

RULE 409: Rule compliance with combustion contaminants concentration of 0.1 grains/cu. ft. at 12% CO₂, over 15 minutes, can be expected as there is no net change in emissions.

RULE 431.1: Compliance with LFG Sulfur content limit of 150 ppmv is expected. Conditions for sulfur content monitoring of the LFG fuel are imposed.

RULE 474: This rule is not applicable since the turbine heat input rating is less than 555 MMBtu/hr and NOx emission will be < 300 ppmv limit.

RULE 475: This rule is not applicable since the turbine rating is less than 10 MW.

REGULATION IX: Compliance with the regulation is expected by complying with the requirements of 40 CFR Subpart WWW and 40 CFR Subpart KKKK (NOx and SOx emission limits).
Compliance is expected.

RULE 1134: This rule is applicable to only existing gas turbines, ≥ 0.3 MW, as of August 4, 1989. Gas turbines and flare are new equipment with operation start up in September 2014. Therefore rule is not applicable.

RULE 1150.1: Pretreated and conditioned LFG (siloxane removal system) will be combusted in Solar Turbine, Mercury 50. Proposed modification for GTs is expected to meet NMOC destruction efficiency, 98% by wt., or 20 ppmv ROG as Hexane in exhaust @ 3% O₂, dry. Also, methane destruction efficiency can be expected 99% (wt.). Compliance is expected based on source tests evaluations (PR14466).
Gas combustion turbines will produce hydrochloric acid (HCl) as combustion product. However, HCl is not listed under Rule 1150.1 Table 1 & 2 although it is subject to Rule 1401.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES	PAGE
	20	14
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

REG XIII: **BACT/LAER:**

The proposed modification for gas turbine is increased heat input rate from 48.1 to 61 MMBTU/HR, for each of the five gas turbines. Facility has proposed reduced concentration limits for NOx, CO and TNMOC and a net mass emission increase of 0.7 lbs/day for CO, 0.8 lbs/day for TNMOC, and 0.9 lbs/day for SOx (less than 1 lb/day). There is a net reduction in NOx emission rate by 1.7 lbs/day.

On 12/8/15, SGP has proposed no emission increase for PM10 (please refer to information under Emissions).

Post-modification decrease/increase per unit (@ 61 MMBTU/HR);

Pollutant	Net decrease/increase Lbs/day
NOx	-1.7
CO	0.7
TNMOC, as CH4	0.8
SO2	0.9
PM10	0

According to SCAQMD's current policy and SIP approved rule, including major sources, BACT/LAER is applicable for greater than 1.0 lb/day net emission increase. Since for the proposed modification, there is a net reduction for daily NOx emission rate and no change in PM10 emission, BACT/LAER is not applicable. Also, CO, TNMOC and SOx, as SO2, daily mass emission rate is estimated < 1 lb/day; BACT/LAER is not applicable.

SOx, as SO2: Facility has proposed SO2 emission increase to 0.9 lb/day (to avoid triggering of BACT) and will comply with the emission limit by monitoring LFG fuel total sulfur, as H2S, and regulating inlet fuel flow rate. New permit conditions are imposed limiting daily SOx emission to 76.4 lbs/day per gas turbine.

Compliance is expected.

Modeling:

There is a net reduction in NOx mass emission rate, as proposed by SGP. No air dispersion modeling is required.

CO is in attainment and hourly net emission increase is within allowable limit for combustion sources, Rule 1303 Appendix A, Table A-1. No modeling is required.

No increase in PM10 mass emission rate is expected. No modeling is required.

TNMOC and SOx are not subject to modeling requirement.
Compliance is expected.

Offsets:

There is a net reduction for NOx mass emission rate, and no change in PM10 mass emission rate. No offset is required for NOx and PM10.

Proposed modification is expected to result in net increase in CO, TNMOC and SOx.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 20	PAGE 15
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

CO is in attainment, therefore offsets are not applicable pursuant to Rule 1301 (b) (1)-12/7/95-General [NSR]-attainment air contaminant.

TNMOC and SOx requires 1 lb/day offset.

The LFG to energy project meets the definition of Essential Public Service, as listed under Rule 1302 (m) (7) "construction and operation of a landfill gas control or processing facility". This facility does not hold any Emission Reduction Credit (ERC) and there are no other permitted equipment under this facility ID could be modified to BARCT levels. Therefore, required offsets (1:1) shall be provided, for each unit, from the Priority Reserve account for this LFGTE operation per Rule 1309.1 (a) (3).

Compliance is expected.

CEQA:

Addendum to SEIR is under review by SCAQMD's Planning, Rule Development and Area Sources Division. This document analyzes the impacts and compares them to the SEIR. No changes to the conclusions are expected and no public review of the document will be needed. In the meantime, proposed Title V facility permit will be sent to EPA for 45-day review. Final Title V facility permit will be issued at the same time final addendum to SEIR is approved by the SCAQMD (Lead Agency).

RULE 1325:

Federal PM2.5 New Source Review Program

This rule is applicable to a "Major Polluting Facility" which, on a pollutant specific basis, is any emissions source (any permitted individual unit, piece of equipment...) located in areas federally designated pursuant to 40 CFR 81.305 as non-attainment for the South Coast Air Basin (SOCAB) which has actual emissions of, or the potential to emit, 100 tons or more per year of PM2.5, or its precursors (for this rule NOx and SO2). A facility is considered to be a major polluting facility only for the specific pollutant(s) with a potential to emit of 100 tons or more per year.

This rule is not applicable based on definition of the Major Polluting Facility (i.e. PTE 100 TPY or more of PM2.5, or its precursor-for this rule means NOx and SO2).

For a single gas turbine permitted unit (source);

PM10=PM2.5 = max. 17.3 lbs/day x 365/2000 = 3.15 TPY < 100 TPY
 NOx = max. 78.3 lbs/day x 365/2000 = 14.3 TPY < 100 TPY
 SOx = max. 74.6 lbs/day x 365/2000 = 13.6 TPY < 100 TPY.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES	PAGE
	20	16
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

RULE 1401: Use New Version Risk Tool (V1.01) for HRA.
January 12-16 2015, Gas Turbine Unit 1, performance source test data are used for estimating MICR, HIA and HIC.
Unit 1 was source tested January 13, 2015 (Report No. 14263.0)
Exhaust flow rate (Q std.) TAC emissions, 1/13/15 = 37074 dscfm, 16.9% O₂, 44.9 MMBTU/HR heat input, Fd = 9483 dscf/MMBTU
Pro-rated exhaust flow rate from 44.9 to 61 MMBTU/HR,
= 37704 x 44.9/61 = 50,368 dscfm
Pro-rated exhaust flow rate mult'n. Factor= 50,368 dscfm@ 61 MM BTU/37,074 dscfm@
44.9 MM BTU
= 1.36
Post-modification TACs, lbs/hr = (ST results lbs/hr @ 44.9 MMBTU/hr) x 1.36
Used Tier 2 screening:
Stack height = 26.5'
Nearest receptors, R = 2500 meters, B = 522 meters, revised (from initial PC a/n submittal, Form 400-PS) - Program allows max = 1000 meters.
Meteor. Station = Reseda.
Estimated post-mod. MICR (not incremental): **R = 1.41E-07, B (@ 522 m) = 3.65 E-08.**
HIA, HIC <1, for each respective organ.
Compliance is expected.

RULE 1401.1: Exempt. This is an existing facility with no nearby school.

REG. XVII: Preventative Significant Deterioration (PSD):

RULE 1701: General - This regulation applies to preconstruction review requirements for stationary sources that emit "attainment air contaminants".

RULE 1702: Rule 1702 (m) (1) defines Major Stationary Source (different categories). The LFGTE project category is not listed as a Major Stationary Source. However, 1702 (m) (2) considers an unlisted stationary source that emits or has PTE 250 TPY or more as a Major Stationary Source.
The LFGTE estimated emissions of attainment pollutants from the proposed project (5-GTs and a flare) are <250 tpy and therefore is not a Major Stationary Source.

RULE 1704: Resource recovery projects are exempt under 1704 (a) (4), and shall not be subject to PSD analysis under 1703 (a) (3) to major stationary source. Therefore, this facility is considered exempt from PSD requirement. Furthermore, the facility is constructed with BACT and the PTE is < 250 tpy and does not require further PSD analysis.

RULE 1714: Prevention of significant deterioration for greenhouse gases
This rule is not applicable as this is not a new construction of major stationary source or an existing major stationary source, defined under 40 CFR part 52.21(b) (1) (i) (a), as LFGTE category is not included and emissions of attainment pollutants from the proposed project (5-GTs and a flare) are <100 tpy. In addition, per 40 CFR part 52.21(b) (1) (i) (b) the stationary source (project) potential to emit for regulated NSR pollutant is less than 250 TPY.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 20	PAGE 17
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

(Deferral for CO2 emissions for bioenergy under PSD and Title V is addressed under Federal Regulations evaluation).

REG. XX: Regional Clean Air Incentive Market (RECLAIM)

This facility is exempt from RECLAIM per Rule 2001 (i) (1) (C) – construction and operation of landfill gas control, processing or landfill gas energy recovery facilities, and such facility is prohibited from electing to enter RECLAIM.

REG. XXX: Title V

The increased heat input rate limit of the five LFG turbines is considered a Title V De Minimis Significant Permit Revision under Rule 3000 (b) (7), since the cumulative emission increases of non-RECLAIM pollutants or HAPS due to these permit revisions do not exceed thresholds, listed under Draft Technical Guidance Document for Title V Program, Version 4.0, March 2005, Chapter 5, Table 5-4 (lbs/day VOC: 30, CO: 220, PM10: 30, and HAP: 30), does not require any significant change in monitoring or permit conditions, does not require relaxation or avoidance of a requirement, does not result in new or additional NSPS or NESHAP requirements and will be subject to an EPA review (Rule 3003(j)). A public notice is not required.

SGP has submitted A/N 577290 for Title V permit revision to include above permits in the Title V facility permit upon approval. Recent Title V facility inspection report, 6/30/15, has no adverse comments for the facility operations. Compliance is expected.

FEDERAL REGULATIONS:

Municipal Solid Waste Landfill NSPS, 40 CFR Part 60, Subpart WWW

§60.752 (b) (2) requires the owner or operator of MSW landfill to route all of the collected gas to a control system that complies with either;

- To an open flare
- A control system designed and operated to reduce TNMOC by 98 wt. % or TNMOC concentration in exhaust to less than 20 ppmvd, as hexane at 3% O2.
- Route the collected gas to a treatment system that processes the collected gas for subsequent sale or use.

Sunshine Canyon landfill (ID # 49111) complies with the applicable requirements. Collected LFG will be treated by Sunshine gas producers (A/N 482510- compressing, de-watering, and filtering and Siloxane removal), thus may meet definition of gas treatment and complying with §60.752 (b) (2) (iii) (C). Therefore, Sunshine Gas Producers facility may comply with the provisions of MSW landfill NSPS up to, and including, the gas treatment system. As the SGP utilizes treated LFG, the combustion equipment may not be subject to emission control compliance demonstration and equipment parameter monitoring and recordkeeping requirements of the MSW landfill NSPS. However, the SGP facility shall comply with all applicable requirements until SGP has obtained EPA approval for meeting the LFG treatment definition and exemption criteria listed under 40 CFR §60.751 and air emissions standards under 40 CFR §60.752(b) (2) (iii) (C).

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES	PAGE
	20	18
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

NSPS Requirements 40CFR Part 60- subpart KKKK

(Stationary Combustion GT > 10 MMBtu/hr)

SO_x:

Proposed gas turbine modification will comply with SO₂ emission standards that GT shall not exceed 0.90 lb/MWh or burn biogas fuel with potential SO₂ emission in excess of 0.15 lb/MMBtu [Per EPA Direct Final Rule effective March 20, 2009, Sec. 60.4330 (a) (2)].

SO_x as SO₂ = 74.60 lbs/day/ 24 hrs. = 3.11 lbs/hr SO₂

3.11 lbs/hr SO₂ /4.9 MW = 0.635 lb/MWh < 0.90 lb/MWh,

OR

3.11 lbs/hr SO₂ / 61.0 MMBtu/hr = 0.051 lb/MMBtu < 0.15 lb/MMBtu.

Compliance is expected with subpart KKKK.

NO_x:

Modified turbine firing fuels 50 MMBtu/hr (HHV)
other than natural gas, and 850 MMBtu/hr

96 ppmv NO_x at 15% O₂ or 590 ng/J
of useful output (4.7 lb/MWh).

Gas turbine NO_x limit is revised from current LAER limit of 15 ppmv NO_x at 15% O₂ to 12.5 ppmv NO_x as proposed by the applicant (permit condition) which is more stringent than 96 ppmv limit.

Compliance is expected with subpart KKKK.

NESHAPS - 40CFR Part 63- Subpart AAAA

Sunshine Canyon MSW Landfill facility is subject to the requirements of this regulation and to comply with start-up, shutdown and malfunction (SSM), compliance determination (§63.1960), deviation reporting (§63.1965) and notification (§63.1980).

Sunshine Gas Producers (SGP) facility's combustion equipment (gas turbines) will use treated gas that meets requirements of the regulation, then the combustion device may not have to meet any emission limits or monitoring requirements. However, the SGP facility shall comply with all applicable requirements until SGP has obtained EPA approval for meeting the LFG treatment definition and exemption criteria listed under 40 CFR §60.751 and air emissions standards under 40 CFR §60.752(b)(2)(iii)(C). [Route the collected gas to a treatment system, route all the collected gas to control system to reduce NMOC by 98 weight percent or reduce NMOC in exhaust to 20 ppmv as hexane at 3% O₂ and compliance determined in the same way it is determined for 40 CFR Part 60 subpart WWW]

SGP is considered a major HAP facility based on single pollutant (HCl), PTE > 10 TPY.

HCl emission factor for gas turbine = 12 lbs HCl/MM SCF LFG (Ref. - EIA study/EIA Report)

HCl emission per GT = 61 MMBTU/HR / 470 BTU/SCF = 0.130 MMft³ LFG/HR

= 12 lbs HCl/MMCF LFG x 0.130 = 1.56 lbs HCl/hr

= 6.83 TPY HCl/GT

= 6.83 TPY x 5 GTs

= 34.2 TPY HCl from GTs (excluding regen. flare)

HCL emission rate determination condition is included under source test requirements.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES	PAGE
	20	19
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

NESHAPS - 40CFR Part 63- Subpart YYYY

LFGTE facility's PTE for any single HAP is estimated at > 10 TPY (see HCl emission estimate under NESHAPS 40 CFR Part 63-Subpart AAAA) and combination of HAP at < 25 TPY.

As the facility is considered a major source of HAP (single pollutant's PTE), per §63.6085 (b) compliance with this regulation is required for combustion gas turbines (considered new if constructed after January 14, 2003).

63.6090(b)(2)-Turbines using LFG \geq 10% of gross heat input (annually) are not required to meet the requirements of this subpart except for 1) initial notification per 63.6145 & 2) additional monitoring and reporting per 63.6125(c) & 63.6150.

63.6125(c) - Monitor and record fuel usage daily with separate fuel meters for each fuel.

63.6150(c) - Table 6 – Annually report (1) fuel flow rate of each fuel, heating value, and % of heat input from LFG fuel (2) operating limits provided in federally enforceable permit and, (3) Any problems or errors suspected with the meters.

Compliance can be expected.

Compliance Assurance Monitoring (CAM) - 40CFR Part 64

SGP is considered a major source. Combustion gas turbines do not have any add-on controls (e.g. catalytic oxidizer, SCR, etc.) to achieve a specified emission limit. However, each GT has a certified CEMS that qualifies as a continuous compliance determination method in accordance with 40 CFR 64.1. Thus, GT is exempt from CAM requirements.

A condition (40 CFR Part 64) is imposed for, NMOC, control by continuous combustion temperature monitoring and recording system to determine exhaust temperature of the last power turbine (T7) per manufacturer's recommendation, and pursuant to the operation and maintenance requirements specified in 40 CFR Part 64.7.

40CFR Parts 51, 52, 70 and 71: (CO2 emission deferral from Bioenergy sources)

On July 1, 2011, US EPA approved final rule – Deferral for CO2 emissions from bioenergy and other biogenic sources under the prevention of significant deterioration (PSD) and Title V programs. However, approval by US EPA for final rule action was deferred for a period of three (3) years; for the application of PSD and Title V to biogenic CO2 emissions from bioenergy and other biogenic sources.

On June 2014, the US Supreme Court issued a decision that held EPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit.

On November 2014, EPA revised framework for assessing biogenic CO2 emissions from stationary sources. EPA has issued a memorandum (Nov. 2014), from Janet G. McCabe, Acting Assistant Administrator, to Air Division Directors, Region 1-10. EPA is still developing the PSD regulations specific to biogenic CO2 emissions and will provide additional updates. As such, determination for final PSD rule is pending.

- Estimated CO2e for this project (GTs) is greater than 100,000 TPY (30,587 TPY/GT x 5 turbines = 152,937 TPY CO2e - NSR Sheet).

The facility is subject to compliance and requirements upon final rule approval.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING AND COMPLIANCE DIVISION PERMIT APPLICATION EVALUATION AND CALCULATIONS	PAGES 20	PAGE 20
	APPL NO SEE BELOW	DATE 02/26/2016
	PROCESSED BY GCR	CHECKED BY

CONCLUSION/RECOMMENDATION:

Permits to construct/operate and a revised Title V permit are recommended for the above equipment with proposed conditions, upon completion of 45-day EPA review and certification of addendum to SEIR by SCAQMD-Lead agency. No public notice is required.

Note: Upon approval of the PC/PO include permits under Section D, Title V permit revision under A/N 577290. Inactive existing PCs under Section H.