PERMIT(S) TO CONSTRUCT EVALUATION

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

MAILING ADDRESS: 425 SOUTH MAIN STREET
ANN ARBOR, MICHIGAN 48104
ATTN.: MICHAEL MANN, SR. PROJECT MANAGER

EQUIPMENT ADDRESS: 14747 SAN FERNANDO ROAD
(SUNSHINE CANYON LANDFILL)
SYLMAR, CA 91342

FACILITY ID: **139938**

EQUIPMENT DESCRIPTION:

A/N 480567:

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, DRIVING A NOMINAL 4.9 MEGAWATT (MW) ELECTRIC GENERATOR.

3. EXHAUST STACK**,** 4**'- 7"** DIA. X 26' - 6**"** HIGH.

A/N 480568:

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, DRIVING A NOMINAL 4.9 MEGAWATT (MW) ELECTRIC GENERATOR.

3. EXHAUST STACK, 4'- 7" DIA. X 26' - 6**"** HIGH.

A/N 480569:

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, DRIVING A NOMINAL 4.9 MEGAWATT (MW) ELECTRIC GENERATOR.

3. EXHAUST STACK, 4'- 7" DIA. X 26' - 6**"** HIGH.

A/N 480570:

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, DRIVING A NOMINAL 4.9 MEGAWATT (MW) ELECTRIC GENERATOR.

3. EXHAUST STACK, 4'- 7" DIA. X 26' - 6**"** HIGH.

A/N 480571:

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, DRIVING A NOMINAL 4.9 MEGAWATT (MW) ELECTRIC GENERATOR.

3. EXHAUST STACK, 4'- 7" DIA. X 26' - 6**"** HIGH.

Conditions:

1. CONSTRUCTION AND 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. THE OWNER OR OPERATOR OF THIS EQUIPMENT SHALL PROVIDE TO THE SCAQMD FOR PRE-INSTALLATION APPROVAL, THE GAS TURBINE FINAL DESIGN DRAWINGS, P&I DIAGRAMS, CONTROL DIAGRAMS, EQUIPMENT SPECIFICATIONS (MAKE , MODEL DIMENSIONS, SIZE AND MAXIMUM CAPACITY) AT LEAST 60 DAYS PRIOR TO INSTALLATION OF THIS EQUIPMENT
   [RULE 204]

5. THIS EQUIPMENT SHALL BE FIRED ONLY WITH LANDFILL GAS EXCEPT WHEN PROPANE IS USED TO IGNITE THE TURBINE DURING START-UP.
[RULE 204]

6. 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)]

7. THE TOTAL HEAT INPUT OF LANDFILL GAS BURNED IN THE GAS TURBINE SHALL NOT EXCEED 48.1 MMBTU/HR (HHV), BASED ON A 24 -HOUR AVERAGE. THE OPERATOR SHALL DETERMINE THE TOTAL HEAT INPUT OF THE LANDFILL GAS AT LEAST ONCE EVERY EIGHT HOURS OF OPERATION, AND MAINTAIN A LOG INDICATING THE TOTAL HIGHER HEATING VALUE OF THE LANDFILL GAS BURNED IN THE GAS TURBINE, BASED ON THE RECORDED FLOW RATE AND THE LATEST BTU CONTENT READING.
[RULE 1303(b) (1)-MODELING, 1303(b) (2)-OFFSET, 3004(a) (4), RULE 1401]

8. THE OPERATOR SHALL SYNCHRONIZE ALL RECORDING DEVICES WITH RESPECT TO THE TIME OF DAY.
[RULE 204]

9. 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]

10. 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, AND 430]

11. 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]

12 A CONTINUOUS COMBUSTION CHAMBER TEMPERATURE MONITORING AND RECORDING SYSTEM SHALL BE MAINTAINED 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 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]

13. THE COMBUSTION CHAMBER TEMPERATURE 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]

14. ALL DEVIATIONS SHALL BE REPORTED TO THE SCAQMD ON A SEMI-ANNUAL BASIS PURSUANT TO THE REQUIREMENTS SPECIFIED IN 40 CFR PART 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 COMBUSTION CHAMBER TEMPERATURE 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]

15. 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]

16. 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]

17. 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]

18. 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 NOX, AND O2 ON A DRY BASIS. IN ADDITION, THE SYSTEM SHALL CONVERT THE ACTUAL NOx CONCENTRATION TO A CORRECTED NOx CONCENTRATION AT 15% O2, DRY, AND RESULTS SHALL BE CONTINUOUSLY RECORDED.
[RULE 218, 1303(b) (1) MODELING, 1303(B) (2)-OFFSET, 3004(a) (4)]

19 WITHIN 180 DAYS AFTER INITIAL START-UP, AND ANNUALLY (WITHIN 45 DAYS OF ANNIVERSARY OF INITIAL TEST) THEREAFTER, THE OPERATOR SHALL CONDUCT PERFORMANCE TESTS, AT FULL 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 AQMD 10 DAYS PRIOR TO THE TESTING SO THAT AN OBSERVER MAY BE PRESENT. ALL SOURCE TESTING AND ANALYTICAL METHODS SHALL BE SUBMITTED TO THE AQMD 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)
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. FORMALDEHYDE, AND ALDEHYDES (EXHAUST ONLY)
H. TOXIC AIR CONTAMINANTS (TAC) INCLUDING, BUT NOT LIMITED TO, BENZENE, CHLOROBENZENE, 1, 2-DICHLOROETHANE, 1, 1-DICHLOROETHENE, DICHLOROMETHANE, TETRACLHOLOROETHYLENE, TETRA CHLOROMETHANE, TOLUENE, 1, 1, 1-TRICHLOROETHANE, TRICHLOROETHYLENE, TRICHLOROMETHANE, VINYL CHLORIDE, AND XYLENE ISOMERS.
I. OXYGEN AND NITROGEN
J. MOISTURE CONTENT
K. TEMPERATURE
L. FLOW RATE
M. VOLATILE ORGANIC COMPOUNDS (VOCS) CONTROL EFFICIENCY, WT% (BASED ON INLET AND EXHAUST VOCS)
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 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 ANNUAL 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, 40 CFR PART 63 SUBPART YYYY]

20. EMISSIONS FROM THE GAS TURBINE SHALL NOT EXCEED THE FOLLOWING:

CONTAMINANT	LBS/DAY
CO	79.0
NOx (AS NO2)	77.8

PM_{10}	17.3
TNMOC (AS CH4)	21.6
SOX (AS SO2)	75.1

[RULE 1303(b) (1)-MODELING, 1303(b) (2)-OFFSET]

21. EMISSION OF OXIDES OF NITROGEN SHALL NOT EXCEED 15 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]

22. EMISSION OF CARBON MONOXIDE SHALL NOT EXCEED 25 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 FORMALDEHYDE SHALL NOT EXCEED 91PPMV, CALCULATED AT 15% O2, DRY BASIS, EXCEPT DURING PERIODS OF STARTUP AND SHUTDOWN NOT TO EXCEED 30 MINUTES PER INCIDENT.
[40 CFR PART 63 SUBPART YYYY]

24. IF THE SOURCE TEST INDICATES ADDITIONAL TOXIC AIR CONTAMINANTS (TAC) COMPOUNDS ARE EMITTED OR THAT TAC RATES ARE SIGNIFICANTLY DIFFERENT THAN THE PREVIOUSLY EVALUATED RISK ASSESSMENT, THEN THE OWNER OR OPERATOR SHALL CALCULATE THE MAXIMUM INDIVIDUAL CANCER RISK (MICR), ACUTE HAZARD INDEX (HIA) AND CHRONIC HAZARD INDEX (HIC), BASED ON THE SOURCE TESTS RESULTS, USING AQMD PUBLISHED "RISK ASSESSMENT PROCEDURES FOR RULES 1401 AND 212" (VERSION 7.0), TO DETERMINE THE COMPLIANCE WITH RULE 1401. RESULTS SHALL BE SUBMITTED TO AQMD WITHIN 90 DAYS AFTER INITIAL TESTING IS COMPLETED.
[RULE 1401]

25. ALL RECORDS SHALL BE KEPT FOR A PERIOD OF AT LEAST FIVE YEARS AND SHALL BE MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

Emissions And Requirements:

THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS.

26.
CO: 2000 PPMV, DRY, 15 MIN. AVG., RULE 407
CO: 25 PPMV, @ 15% O2, DRY, MAJOR SOURCE – MFGR. GUARANTEE
NOx: 15 PPMV, @ 15% O2, DRY, MAJOR SOURCE - 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.
ROG: 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: 0.90 LB/MWh OR 0.15 LB/MMBTU, NSPS, 40 CFR 60 SUBPART KKKK.

SOx: 0.2% RULE 53
FORMALDEHYDE: 91 PPMV, @ 15% O2, DRY, NESHAP, 40CFR63 SUBPART YYYY.

APPLICATION NO. : 482510

LANDFILL GAS (LFG) TREATMENT AND COMPRESSION SYSTEM, 10,450 SCFM MAXIMUM CAPACITY, CONSISTING OF:

1. LANDFILL GAS SUPPLY FROM GAS COLLECTION HEADER (SUNSHINE CANYON LANDFILL).
2. LIQUID/GAS SEPARATION KNOCK-OUT POT.
3. TWO (2) LANDFILL GAS BLOWERS, 300 H.P., EACH.
4. AIR COOLED HEAT EXCHANGER.
5. SIX (6) FIRST- STAGE COMPRESSORS, EACH 300 H.P., 60 PSIG NOMINAL, AND A FILTER.
6. AIR-TO-GAS COOLER, OIL/WATER SEPARATOR, AND A CHILLER.
7. TWO (2) DUPLEX PARKER/DOMNICK HUNTER, MODEL GES 1500 SILOXANE REMOVAL SYSTEMS, CONSISTING OF FOUR (4) STAINLESS STEEL PRESSURE VESSELS, IN PARALLEL, EACH WITH MINIMUM OF 12,000 LBS ADSORPTION MEDIA. PRE-FILTER (0.01 MICRON PM) AND AFTER-FILTER ELEMENT (1 MICRON PM).
8. REGENERATION PURGE AIR BLOWER, 2,200 SCFM, AND WITH AN ELECTRIC HEATER. 168 KW. THE MEDIA TO BE REPLACED AND/OR TO BE REGENERATED BY TEMPERATURE SWING ADSORPTION (TSA) PROCESS MANUFACTURED BY DOMNICK HUNTER.

9. TWO (2) SECOND STAGE COMPRESSORS, EACH 900 H.P., 255 PSIG NOMINAL, AIR COOLED HEAT EXCHANGER, AND EQUIPPED WITH A DEWATERING VESSEL, OIL/WATER SEPARATOR, A COALESCING FILTER (3 MICRON PM), AND GAS/GAS REHEATER.

10. REGENERATION OFF-GAS EXHAUST, TOTAL 2,200 SCFM, VENTING TO ZINK ULTRA LOW EMISSION (ZULE) FLARE (A/N 480572).

CONDITIONS:

1. CONSTRUCTION AND 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. THE OWNER OR OPERATOR OF THIS EQUIPMENT SHALL PROVIDE TO THE SCAQMD FOR PRE-INSTALLATION APPROVAL, FINAL LANDFILL GAS (LFG) TREATMENT AND COMPRESSION SYSTEM P & I DIAGRAMS, CONTROL DIAGRAMS, EQUIPMENT SPECIFICATIONS (MAKE , MODEL DIMENSIONS, SIZE AND MAXIMUM CAPACITY) AND OTHER VENDOR DATA, AT LEAST 60 DAYS PRIOR TO INSTALLATION OF THIS EQUIPMENT
   [RULE 204]

5. 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, AND 430]

6. DURING AN ADSORBENT REGENERATION MODE, THE OFF-GAS FROM THE ADSORBER TRAIN SHALL BE VENTED ALL TIME TO AN AIR POLLUTION CONTROL SYSTEM (FLARE) WHICH IS IN FULL OPERATION AND HAS A VALID PERMIT TO CONSTRUCT/ OPERATE ISSUED BY THE SCAQMD.
[RULE 1303(a) (1) – BACT]

7. THE OPERATOR SHALL INSTALL AND MAINTAIN AN ADEQUATE NUMBER OF SAMPLING PORTS AND WELDED NIPPLES WITH CAPS, IN THE INLET AND OUTLET LINE OF THE EQUIPMENT, AND PROVIDE SAFE ACCESS TO THESE SAMPLING PORTS IN ACCORDANCE WITH RULE 217 AND SCAQMD APPROVAL.
[RULE 217]

8. ALL RECORDS SHALL BE KEPT AND MAINTAINED FOR A PERIOD OF AT LEAST FIVE YEARS AND SHALL BE MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

APPLICATION NO. : 480572

LANDFILL GAS (LFG) FLARE CONSISTING OF:

1. EXHAUST GAS FROM THE LFG TREATMENT AND COMPRESSION SYSTEM (A/N 482510).

2. FLARE, JOHN ZINK, MODEL ZULE ULTRA LOW EMISSION, LANDFILL GAS AND PURGE –AIR, RATED AT 6,400,000 BTU PER HOUR BURNER, WITH A FLAME ARRESTER, PROPANE PILOT WITH AN AUTOMATED TRU-LITE IGNITOR, COMBUSTION AIR BLOWER, AUTOMATIC IGNITION, FLARE SHUT DOWN, AND WITH A PROGRAMMABLE LOGIC CONTROLLER (PLC) SYSTEM.

3. EXHAUST STACK, 4’- 0” DIA. X 40’- 0” H.

CONDITIONS:

1. CONSTRUCTION AND 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 AND MAINTAINED BY PERSONNEL PROPERLY TRAINED IN ITS OPERATION.
[RULE 204]

4. THE OWNER OR OPERATOR OF THIS EQUIPMENT SHALL PROVIDE TO THE SCAQMD FOR PRE-INSTALLATION APPROVAL, FINAL LANDFILL GAS (LFG) FLARE SYSTEM P & I DIAGRAMS, CONTROL DIAGRAMS, EQUIPMENT SPECIFICATIONS (MAKE , MODEL DIMENSIONS, SIZE AND MAXIMUM CAPACITY) AND OTHER VENDOR DATA, AT LEAST 60 DAYS PRIOR TO INSTALLATION OF THIS EQUIPMENT
[RULE 204]

5. THE OPERATOR SHALL INSTALL AND MAINTAIN AN ADEQUATE NUMBER OF SAMPLING PORTS AND WELDED NIPPLES WITH CAPS, IN THE INLET GAS AND EXHAUST STACK AND PROVIDE SAFE ACCESS TO THESE SAMPLING PORTS IN ACCORDANCE WITH RULE 217 AND SCAQMD APPROVAL.
[RULE 217]

6. A FLOW INDICATOR AND RECORDING DEVICE SHALL BE MAINTAINED IN THE LANDFILL GAS SUPPLY LINE TO THE FLARE TO MEASURE AND RECORD THE QUANTITY OF LANDFILL GAS (IN SCFM) BURNED IN FLARE.
[RULE 1303(b) (2)-OFFSET, 3004 (a) (4)]

7. THE OPERATOR SHALL MEASURE AND RECORD THE BTU CONTENT OF THE LANDFILL GAS BURNED IN THE FLARE AT LEAST ONCE PER WEEK USING AN INSTRUMENT APPROVED BY THE SCAQMD.
[RULE 1303(b) (1)-MODELING, 1303(b) (2)-OFFSET, 3004(a) (4)]

8. THE TOTAL VOLUME OF LANDFILL GAS BURNED IN FLARE SHALL NOT EXCEED MAXIMUM HEAT INPUT RATE OF 6.4 MMBTU PER HOUR. A LOG SHALL BE KEPT INDICATING THE TOTAL HEATING VALUE OF LANDFILL GAS BURNED IN FLARE BASED ON THE RECORDED FLOW RATE (SCFM) AND THE LATEST WEEKLY BTU CONTENT (BTU/SCF) READING.
[RULE 1303(b) (1) AND (b) (2)–MODELING AND OFFSET, 1401]

9. OPERATION OF THIS EQUIPMENT USING LFG SHALL BE LIMITED TO NO MORE THAN 16 HOURS IN ONE DAY, DURING WHICH PERIOD EXHAUST FROM THE LFG TREATMENT'S MEDIA REGENERATION CYCLE IS TREATED.

[RULE 1303(b) (1) AND (b) (2)–MODELING AND OFFSET, 1401]

10. THIS EQUIPMENT SHALL BE EQUIPPED WITH A TEMPERATURE INDICATOR AND RECORDER WHICH MEASURES AND RECORDS THE EXHAUST GAS TEMPERATURE IN THE FLARE STACK. THE TEMPERATURE INDICATOR AND RECORDER SHALL OPERATE WHENEVER THE FLARE IS IN OPERATION. THE TEMPERATURE SHALL BE MEASURED AT A LOCATION ABOVE THE FLAME ZONE, AT LEAST 0.6 SECOND DOWNSTREAM OF THE BURNER, AND NOT LESS THAN TWO (2) FEET BELOW THE TOP OF THE STACK.
[RULE 1303(a) (1)-BACT, 3004 (a) (4)]

11 WHENEVER THE FLARE IS IN OPERATION, A TEMPERATURE OF NOT LESS THAN 1400 DEGREES F, 15 MINUTE AVERAGE, AS MEASURED BY THE TEMPERATURE INDICATOR AND RECORDER SHALL BE MAINTAINED EXCEPT DURING PERIODS OF STARTUP AND SHUTDOWN. STARTUP IS DEFINED AS THE PERIOD FROM FLARE IGNITION TO THE TIME WHEN 1400 DEGREES F IS ACHIEVED, NOT TO EXCEED 30 MINUTES. SHUTDOWN IS THE PERIOD FROM WHEN THE GAS VALVE BEGINS TO BE SHUT AND COMPLETELY SHUTS OFF, NOT TO EXCEED 30 MINUTES.
[RULE 1303(a) (1)-BACT]

12. ALL RECORDING DEVICES SHALL BE SYNCHRONIZED WITH RESPECT TO TIME OF THE DAY.
[RULE 204]

13. THE AUTOMATIC SHUTDOWN SAFETY SYSTEM SHALL BE TESTED ANNUALLY FOR PROPER OPERATION AND THE RESULTS RECORDED.
[RULE 1303(a) (1)-BACT]

14. WITHIN 180 DAYS AFTER INITIAL START-UP, AND ANNUALLY (WITHIN 45 DAYS OF ANNIVERSARY OF INITIAL TEST) THEREAFTER, THE OPERATOR SHALL CONDUCT PERFORMANCE TESTS IN ACCORDANCE WITH THE TEST PROCEDURES. A SOURCE TEST PROTOCOL SHALL BE PROVIDED TO THE AQMD FOR APPROVAL AT LEAST 30 DAYS PRIOR TO THE SCHEDULED TESTING. WRITTEN NOTIFICATION OF THE SCHEDULED TEST DATE SHALL BE PROVIDED TO THE AQMD AT LEAST SEVEN (7) DAYS PRIOR TO THE DATE SO

THAT THE TESTING MAY BE OBSERVED BY AQMD PERSONNEL.THE TESTING SHALL BE CONDUCTED WHEN THE EQUIPMENT IS IN FULL OPERATION, AND SHALL INCLUDE, BUT NOT LIMITED TO, A TEST OF THE INLET TO THE FLARE AND THE FLARE EXHAUST FOR:

A. METHANE
B. TOTAL NON-METHANE ORGANIC COMPOUNDS (TNMOC)
C. TOXIC AIR CONTAMINANTS (TAC) INCLUDING, BUT NOT LIMITED TO, BENZENE, CHLOROBENZENE, 1, 2-DICHLOROETHANE, 1, 1-DICHLOROETHENE, DICHLOROMETHANE, TETRACLHOLOROETHYLENE, TETRA CHLOROMETHANE, TOLUENE, 1, 1, 1-TRICHLOROETHANE, TRICHLOROETHYLENE, TRICHLOROMETHANE, VINYL CHLORIDE, AND XYLENE ISOMERS (EXHAUST ONLY).
D. ACETALDEHYDE, FORMALDEHYDE (EXHAUST ONLY).
E. NOX, AS NO2 (EXHAUST ONLY)
F. SOX, AS S02 (EXHAUST ONLY)
G. CO (EXHAUST ONLY)

H. TOTAL PARTICULATES/PM10 (EXHAUST ONLY)
I. OXYGEN
J. MOISTURE CONTENT
K. TEMPERATURE
L. FLOW RATE

[RULE 1303(b) (1) AND (b) (2)–MODELING AND OFFSET, 1401, 1150.1, 3004 (a) (4), 40 CFR PART 60 SUBPART WWW]

15. THE SOURCE TEST REPORT FOR THE FLARE TESTED SHALL INCLUDE: EMISSIONS OF CO, NOx, TNMOCs, TOTAL PARTICULATES/PM10, SOx AND TAC, IN UNITS OF LBS/HR AND PPMV (EXCEPT TOTAL PARTICULATES/PM10 WHICH SHALL BE IN LBS/HR AND GR/SCF), OVERALL TNMOC DESTRUCTION EFFICIENCY (WT %), ACETALDEHYDE, FORMALDEHYDE, EMISSIONS (LBS/HR AND PPMV), AND TNMOC EMISSIONS (PPMV), DRY BASIS, AS HEXANE AT 3% OXYGEN. THE REPORT SHALL ALSO PROJECT THE TOTAL ANNUAL HCL EMISSIONS BASED ON THE RESULTS

[RULE 1303(b) (1) AND (b) (2)–MODELING AND OFFSET, 1401, 1150.1, 3004 (a) (4), 40 CFR PART 60 SUBPART WWW, RULE 1150.1]

16. THE MAXIMUM FLARE SKIN TEMPERATURE AT ANY LOCATION SHALL NOT EXCEED 250 DEGREES FAHRENHEIT.
[RULE 217]

17. EMISSIONS FROM THE FLARE SHALL NOT EXCEED THE FOLLOWING:

POLLUTANT	LBS/DAY
CO	6.15
NOX AS NO2	2.60
PM10	26.1
ROG	1.88
SOX AS SO2	6.60

[RULE 1303(a) (1) -BACT, RULE 1303(b) (1) AND (b) (2)–MODELING AND OFFSET, 1401]

18. THE OPERATOR SHALL OPERATE AND MAINTAIN THIS EQUIPMENT ACCORDING TO THE FOLLOWING REQUIREMENTS:

THE EXHAUST TEMPERATURE SHALL BE MAINTAINED AT A MINIMUM OF 1,400 DEGREES FAHRENHEIT WHENEVER THE EQUIPMENT IT SERVES IS IN OPERATION.

CONTINUOUS EXHAUST TEMPERATURE MONITORING AND RECORDING SYSTEM SHALL BE 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 AND SHALL BE INSPECTED, MAINTAINED, AND CALIBRATED ON AN ANNUAL BASIS IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS USING AN APPLICABLE AQMD OR EPA APPROVED METHOD.

FOR THE PURPOSE OF THIS CONDITION, A DEVIATION SHALL BE DEFINED AS WHEN A TEMPERATURE OF LESS OR GREATER THAN 1,400 DEGREES FAHRENHEIT OCCURS DURING

NORMAL OPERATION. THE OPERATOR SHALL REVIEW THE RECORDS OF TEMPERATURE ON A DAILY BASIS TO DETERMINE IF A DEVIATION OCCURS OR SHALL INSTALL AN ALARM SYSTEM TO ALERT THE OPERATOR WHEN A DEVIATION OCCURS.

FOR EACH SEMI-ANNUAL REPORTING PERIOD SPECIFIED IN CONDITION NO. 23 IN SECTION K, WHENEVER A DEVIATION OCCURS AT OR ABOVE 1,400 DEGREES FAHRENHEIT, 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.

ALL DEVIATIONS SHALL BE REPORTED TO THE AQMD ON A SEMI-ANNUAL BASIS PURSUANT TO THE REQUIREMENTS SPECIFIED IN 40 CFR PART 64.9 AND CONDITION NOS. 22 AND 23 IN SECTION K OF THIS PERMIT.

THE OPERATOR SHALL SUBMIT AN APPLICATION WITH A QUALITY IMPROVEMENT PLAN (QIP) IN ACCORDANCE WITH 40 CFR PART 64.8 TO THE AQMD IF AN ACCUMULATION OF DEVIATIONS EXCEEDS 5 PERCENT 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 AQMD WITHIN 90 CALENDAR DAYS AFTER THE DUE DATE FOR THE SEMI-ANNUAL MONITORING REPORT.

THE OPERATOR SHALL INSPECT AND MAINTAIN ALL COMPONENTS OF THIS EQUIPMENT ON AN ANNUAL BASIS IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

THE OPERATOR SHALL KEEP ADEQUATE RECORDS IN A FORMAT THAT IS ACCEPTABLE TO THE AQMD TO DEMONSTRATE COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS SPECIFIED IN THIS CONDITION AND 40 CFR PART 64.9 FOR A MINIMUM OF FIVE YEARS. [RULE 3004(A) (4)-PERIODIC MONITORING, 40CFR PART 64]

19. OPERATION OF THIS EQUIPMENT SHALL NOT RESULT IN THE RELEASE OF RAW LANDFILL GAS INTO THE ATMOSPHERE. ANY BREAKDOWN OR MALFUNCTION OF THIS EQUIPMENT RESULTING IN THE EMISSION OF RAW LANDFILL GAS SHALL BE REPORTED TO THE AQMD WITHIN TWENTY-FOUR HOURS AFTER OCCURRENCE AND IMMEDIATE REMEDIAL MEASURES SHALL BE UNDERTAKEN TO CORRECT THE PROBLEM AND PREVENT FURTHER EMISSIONS INTO THE ATMOSPHERE.
[RULE 430]

20. ALL RECORDS SHALL BE KEPT AND MAINTAINED FOR AT LEAST FIVE YEARS AND SHALL BE MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (4)]

Emissions And Requirements:

21. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

CO: 2000 PPMV, RULE 407
CO: 0.06 LB/MMBTU HEAT INPUT- BACT/LAER
NOx: 0.025 LB/MMBTU HEAT INPUT- BACT/LAER

NMOC: 98% DESTRUCTION OR 20 PPMV, AS HEXANE, RULE 1150.1, 40CFR60 SUBPART WWW
PM: RULE 404, SEE APPENDIX B FOR EMISSIONS LIMITS
PM: 0.1 gr/scf @ 12% CO2, RULE 409
SOx: BASED ON MAXIMUM 150 PPMV H2S CON. IN LFG, RULE 431.1

BACKGROUND:

Sunshine Gas Producers, LLC (SGP), a partnership between DTE Biomass Energy and Landfill Energy Systems submitted above-mentioned applications for permits to construct and operate. Derenzo and Associates, Inc., Environmental Consultants, prepared and submitted the complete application package in early April and May 2008. The applications are;

A/N 480567 through 480571 –Five (5) identical, LFG fired gas turbines, each Solar Mercury 50, generating 4.9 MW electricity (Gross 24.5 MW).

A/N 482510 – LFG treatment and compression system for Siloxane removal, 10,450 scfm maximum capacity, with on-site media regeneration.

A/N 480572 – LFG/Purge-Air enclosed flare, John Zink ZULE, 6.4 MM Btu/hr rating.

A/N 480628 – Initial Title V permit application.

The proposed landfill gas to energy project will be located at Sunshine Canyon Landfill (active LF, Facility ID # 49111, that will provide LFG) which is located in Sylmar, Los Angeles County, California. The landfill is owned and operated by Republic Services, Inc. SGP has received numerous Notices of Violation as result of odor complaints. SGP is considered a separate facility with Facility ID # 139938.

Proposed LFGTE facility's air pollutants' emissions rates are expected to exceed major source threshold specified in Regulation XXX, Rule 3001. Therefore, this facility is considered a Title V facility. The facility is subject to applicable state and federal regulations, such as 40 CFR Part 52.21, 40 CFR 60 subpart WWW, 40 CFR 60 subpart KKKK, 40 CFR 63 subpart AAAA, 40 CFR 63 subpart YYYY, 40 CFR part 64.

NOTE: On July 7, 2009, the facility submitted revised emissions, air quality modeling and HRA analysis based on updated equipment specifications and alternate construction site for the LFGTE project.

PROCESS DESCRIPTION:

APPLICATION NO. : 482510

LANDFILL GAS (LFG) TREATMENT & COMPRESSION SYSTEM, 10,450 SCFM TOTAL MAXIMUM CAPACITY (16 hrs day operation).

The above-described equipment (A/N 482510) will treat raw LFG from the gas collection header (from Sunshine Canyon Landfill). The system consists of liquid/gas separator, gas blowers, first-stage compressor and a filter, air cooled heat exchanger and moisture separator, bulk siloxane removal systems with adsorption media, regeneration purge-air blower with electrical heater and automatic temperature swing adsorption (TSA) process controls, final stage compressor with dewatering and coalescing filter, polishing siloxane vessel (media), and regeneration off-gas exhaust to Zink ultra low emission flare (ZULE).

The proposed gas cleaning system with "on-site regeneration" is the more recent feature for LFG application. Volatile organic silicon compounds (VOSC) adsorption with proprietary solid media is a well-proven technology. The proposed LFG treatment and compressor system will produce a fuel that is filtered, to remove PM down to 3-microns in diameter, and contains less than 1.5% moisture. The siloxane removal system is designed to remove siloxane compounds in the LFG to a final outlet concentration of 1 mg/m^3.

At regular intervals, the adsorption media (two vessels in pairs, one on-line, other stand-by mode) in the siloxane removal system is regenerated by desorbing the captured siloxanes with the use of heated air supplied from an electric heater and blower skid. The heated air and desorbed siloxanes will be piped to an enclosed flare that will combust fuel impurities (organic siloxanes and hydrocarbons). A single siloxane adsorption vessel will undergo regeneration at a time, and will regenerate two adsorption vessels per day (2200 scfm waste gas air stream for a total of 16 hours).

APPLICATION NO. : 480572

LFG/Purge-Air enclosed flare, John Zink ultra low emission ZULE, 6.4 MM BTU/hr rating.
Specifications: (revised)

Purge air from system regeneration	2200 scfm
LFG fuel requirement	275 scfm
Maximum Heat release	6.4 MMBTU/hr at LHV (387.175 BTU/SCF)
Operating Temperature	1600° F
Exhaust gas flow rate	13,238 at 1600° F (3406 scfm)
Exhaust stack height	40 feet

Exhaust stack diameter	48 inches (ID 43.5 inches)
Combustion chamber volume	341 ft^3
Exit Velocity	21.4 ft/sec
Retention time	1.5 seconds

The proposed flare will combust off-gases generated during regeneration of adsorbent (A/N 482510). The off-gases, mainly purged-air (maximum 2200 scfm with negligible BTU) will be mixed with LFG fuel (maximum 275 scfm clean LFG) will be combusted to control emissions. Flare is designed (revised design specs. submitted 7/07/08) for maximum of 275 scfm LFG plus airflows, including purge-air, and is rated for 6.4 MMBTU/hr heat input. The manufacturer, John Zinc has guaranteed (see letter from John Zink Co. to DTE Biomass Energy, April 4, 2008) to meet the current LAER requirements for NOx (0.025 lb/MMBTU/hr) and CO (0.06 lb/MMBTU/hr). VOC destruction efficiency is expected to be 98% or better. Flare performance summary data is provided for the operating range of 1400 to 1800 deg F., with exhaust flow rates, velocity, retention time, and exhaust gas composition.

APPLICATION NOS. : 480567 through 480571

Five gas turbines, each Solar Mercury 50, LFG fired with gross electricity generation capacity of 24.5 MW.

Applicant has proposed to install five (5) identical gas turbines to generate approximately 24.5 MW gross electricity (4.9 MW each turbine). Ambient air will be filtered and compressed in multi-stage axial flow compressor. LFG fuel at high pressure will be introduced into the annular, ultra lean premix (ULP) combustor with fuel injectors. Upon combustion at high temperature and pressure, the hot exhaust gas drives a generator producing 4.9 MW power. This is a simple cycle turbine with no energy recovery downstream, and exhaust gases leave through the stack. There are no add-on controls for further reduction of air pollutants. Products of combustion are CO, NOx, ROG (with TACs), PM, SOx, CO2 and moisture. Each gas turbine will be equipped with continuous emission monitors (CEM) to monitor NOx and oxygen concentrations in the exhaust.

Gas turbine specifications:

Manufacturer	Solar
Model	Mercury 50
Exhaust Stack	4'- 7" DIA. X 26' - 6" HIGH (Revised)
Heat Input Capacity	48.1 MMBTU/hr (HHV).
Heat Rate	8833 Btu/KW.hr
Thermal Efficiency	38.2%
Power Output	4.9 MW
Inlet flow, Max.	2060 scfm LFG [@ 350 BTU/SCF LHV]
Exhaust flow rate	29,722 dscfm @ 15% O2 (67,560 acfm, calc.)

Exhaust Temperature 722 Deg. F

NOTE: On July 8, 2011, SGP informed via E-mail to revise NOx and CO emissions based on manufacturer's revised emission guarantee for the Mercury Turbines.
NOx emission manufacturer guarantee = 15 ppmv @ 15% O2, and
CO emission manufacturer guarantee = 25 ppmv @ 15% O2, and

Start up and shut down emissions:
Propane gas will be used during start-ups. The proposed gas turbine is a simple cycle with no add-on controls (such as SCR or catalytic oxidation). Therefore, there will be no minimum temperature requirements. Generally, this type of gas turbine does not take long time for start up or shut down. Considering short periods for start-up and shutdown (less than 30 min.) and not having add-on controls these emissions are not accounted towards maximum emissions. The required CO and NOx con. limits exclude start-up and shutdown period not to exceed 30 minutes, each.

EMISSIONS:

Gas Turbines A/N 480567 through 480571: (2060 scfm LFG @ 350 Btu/scf, 43.28 MMBtu/hr heat input rate, 29,722 dscfm exhaust @ 15% O2, 4.9 MW Power output)

ONE GAS TURBINE:

	Emission Factor	Emission Rates		
Pollutant	**lbs/MMBtu**	**lbs/hr**	**lbs/day**	**tons/yr**
NO_x, as NO_2		3.24[1]	77.8	14.2
CO		3.29[1]	79.0	14.4
TNMOC (as CH_4)		0.90	21.6	3.9
SO_x, as SO_2		3.13	75.1	13.7
$PM_{10}/PM_{2.5}$+	0.015	0.72	17.3	3.16

* E.F. for NOx and CO derived from calculated lbs/hr emission and 43.28 MMBtu/hr heat input rating.
[1] NO_x based on 15 ppmvd @ 15% O_2, Manuf. guarantee. (E-mail from SGP, July 8, 2011)
[1] CO on 25 ppmvd @ 15% O_2, Manuf. guarantee. (E-mail from SGP, July 8, 2011)
TNMOC based on 98% DRE, 8600 ppmv TNMOC in LFG fuel (lower mass emission compared to 20-ppmv, hexane, at 3% O_2)
SO_x based on 150 ppmv H_2S in LFG.

PM_{10} EF = 0.015 lbs/MMBtu, revised, based on review of tests results of Sunshine Canyon landfill enclosed flare and discussions with Solar Turbine representative (lower than 0.021).
+ $PM_{10}/PM_{2.5}$ daily emissions revised based on 48.09 MMBtu/hr heat input based on HHV (E-mail of 3-11-2011 and conference call discussions). Applicant has informed that 0.015 E.F. is based on HHV. Also, same mass emission rate used for PM10 modeling that has complied with Rule 1303. For gaseous combustion PM10 is assumed as PM2.5.

NOx = (29722 dscfm @15% O2) (15 E-06 NOx) (1/379) (46) (60) = 3.24 lbs/hr = 77.8 lbs/day

CO = (29722 dscfm @15% O2) (25 E-06 NOx) (1/379) (28) (60) = 3.29 lbs/hr = 79.0 lbs/day

TNMOC @98% DRE = (2060 scfm LFG) (8600 E-06 TNMOC) (1/379) (16) (60) (1.0-0.98)
= 0.90 lbs/hr = 21.6 lbs/day
SOx @ 150 ppmv H2S in LFG = (2060 scfm LFG) (150 E-06 H2S) (1/379) (64) (60)
= 3.13 lbs/hr = 75.12 lbs/day

PM_{10} = (48.09 MMBtu/hr, using HHV) (0.015 lbs/MMBtu) = 0.72 lbs/hr = 17.3 lbs/day

Emissions from Five (5) GAS TURBINES:
(48.1 MMBTU/HR USING HHV)

	Emission Rates (5 GTs)		
Pollutant	**lbs/hr**	**lbs/day**	**tons/yr**
NO_x, as NO_2	16.2	388.8	70.9
CO	16.45	394.8	72.0
TNMOC (as CH_4)	4.50	108	19.7
SO_x, as SO_2	15.65	375.6	68.5
$PM_{10}/PM_{2.5}$	3.60	86.4	15.8

A/N 480572, Regeneration Waste Gas/LFG flare, 6.4 MMBTU/HR (revised) Rating.
Waste gas is only produced during adsorption vessel regeneration cycle, which is approximately 8 hrs (plus 2 hrs cool down period). Therefore, the flare will be in service on an intermittent basis. A maximum of two regeneration cycles will occur per day. These regenerations will occur for one vessel at a time (i.e. 2200 scfm of purge waste gas for total of 16 hrs).

Particulate matter emission from Regeneration Process (from Appendix E-2, submittal updated June 24, 2009).

Assumptions:
3300 scfm LFG treated by a single regeneration vessel:

EF = 1.8 lb PM /MMcf LFG (derived from existing flare tests data),

PM_{10} emission (adsorbed) over an estimated 36 hr treatment operation:
PM_{10} = (3300 scfm) (60 min/hr) (36 hrs) (1.8 lb PM/MMcf) = 12.83 lbs PM_{10} adsorbed.

PM_{10} emission from LFG combustion in flare,
(275 scfm) (60 min/hr) (8 hrs) (1.8 lb PM/MMcf) = 0.24 lbs PM_{10}

Total PM_{10} emission by media regeneration (one vessel) and LFG combustion,
= 12.83 + 0.24
=13.07 lbs PM_{10} (1.63 lb/hr – based on 8 hours/day)

Total PM_{10} emissions released from the flare (operating 16 hours per day) and maximum of 2 vessels regenerated per day = 26.1 lbs PM_{10} /day.

	Emission factor		**Flare Emission Rates**[2]		
Pollutant	**lbs/MMBtu**	**lbs/MMcf**	**lbs/hr**	**lbs/day**	**tons/yr**
NO_x, as NO_2	0.025[3]	--	0.16	2.56	0.46
CO	0.060[3]	--	0.38	6.15	1.12
TNMOC (VOC)	0.018[4]	7.11	0.11	1.88	0.34
SO_x, as SO_2[5]	0.064	24.8	0.41	6.56	1.20
$PM_{10}/PM_{2.5}$	---	1.8[6]	1.63[7]	26.1[7]	4.76

[2] Emission rates based on 16 hrs/day, 6.4 MMBTU/HR
[3] LAER emission factors, ZULE flare guarantee.
[4] Based on 98% DRE for LFG -TNMOC.
[5] Based on 150 ppmv H_2S in LFG.
[6] Based on source test results for existing LFG flare (at Sunshine Canyon)
[7] Total emissions including release of PM during regeneration cycle (in waste gas purge) and from supplemental LFG combustion.
(150 scf H_2S/MMscf LFG)(1 mole SO_2/mol H_2S)(64 lb SO_2/mol) (387 scf/mol)=24.8 lb SO_2 /MMcf
(24.8 lb SO_2 /MMcf)(389 Btu/scf HHV) = 0.064 lb SO_2/MMBtu (HHV)

TOTAL PROJECT EMISSIONS: (5 GTs + Flare)

Pollutant	Emission Rates lbs/hr (5 GTs)	lbs/hr (Flare)	Project Emissions lbs/hr	lbs/day*	tons/yr
NO_x, as NO_2	16.2	0.16	16.36	**391.3**	71.4
CO	16.45	0.38	36.58	**400.9**	73.2
TNMOC (VOC)	4.50	0.11	4.61	**109.8**	20.0
SO_x, as SO_2	15.65	0.41	16.06	**332.2**	69.7
$PM_{10}/PM_{2.5}$	3.60	1.63	5.23	**112.5**	20.6

*Lbs/day includes flare emissions @ max. 16 hrs/day.
Lbs/day Project emissions shown in **BOLD** exceed daily threshold limits under Rule 212 (g).

AEIS / NSR:
For LFG treatment and compression system, A/N 485210, emissions entered = 0 (venting to flare). Uncontrolled and controlled emissions are assigned to flare, A/N 480572.

RULES EVALUATION:

RULE 212: This is a significant project in terms of criteria pollutants' emissions.
There is no school within 1000' of emission source.
Based on PRA staff's review it was determined that health risk due to operation of each equipment is expected to be less than one in a million (Revised HRA analysis submittal by applicant, 7-07-09).
Estimated maximum daily emissions for criteria pollutants, from the Project – consisting of 5 GTs and one flare - exceed daily threshold limits indicated under 212(g). Therefore, public notice is required.
Compliance can be expected.

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.

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).

FlARE: For flare, estimated PM_{10} emission = 1.63 lbs/ hr
Exhaust flow = 3,406 scfm OR 3,099 dscfm @ 9% moisture, estimated

$$C = \frac{1.63 \text{ lb/hr} \times (7{,}000 \text{ grains/lb})}{3099 \text{ dscfm} \times (60 \text{ min/hr})}$$

C = 0.061 grains/dscf < allowable 0.123 grains/dscf at 3100 dscfm
Compliance is expected.

RULE 407: Compliance is expected with the 2000 ppmv CO limit.
Gas turbine and LFG flare are 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 con. of 0.1 grains/cu. ft. at 12% CO2, over 15 minutes can be expected from other GTs and LFG flares permitted in the District.

RULE 431.1: Compliance with LFG Sulfur content limit of 150 ppmv is expected based on the information provided, maximum H2S con. in LFG is 140 ppmv.

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: See Federal Regulations evaluation for NSPS requirements 40 CFR Part 60 subpart KKKK for New Stationary Gas Turbines (Note: Subpart GG is superseded by subpart KKKK)

RULE 1134: This rule is applicable to only existing gas turbines, ≥ 0.3 MW, as of August 4, 1989. This is a new construction, therefore rule is not applicable.

RULE 1150.1: Pretreated and conditioned LFG will be combusted in Solar Turbine, Mercury 50 and LFG flare. Similar type of turbines are issued PCs. Proposed GTs and flare are 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) – Rule 1150.1 amended April 1, 2011. Compliance can be determined upon completion of the source tests and final report.
Gas combustion turbines and flare will produce hydrochloric acid (HCl) as combustion product. However, HCl is not listed under Rule 1150.1 Table 1 & 2 and no source testing is required for HCl. (Note: HCl is subject to Rule 1401 HIC, HIA).

REG XIII:

LAER/BACT: Current LAER for CO is 130 ppmv @ 15% O2, dry and for NOx is 25 ppmv @ 15% O2, dry.

The proposed gas turbine has no add-on controls. Add-on controls, such as SCR with ammonia injection for NOx control, and oxidation catalysts to reduce CO and VOC emissions are generally not cost effective (PCs are granted for GTs for similar projects without add-on controls).
However, proposed GTs are expected to meet manufacturer's revised guaranteed limits for NOx (15 ppmv @ 15% O2) and CO (25 ppmv @ 15% O2), based on E-mail from SGP of July 8, 20111.

Please refer to the application package for detailed LAER analysis (for GTs and flare) under Section 6.3.1 through 6.3.5.

Modeling: A formal request was submitted to Planning, Rule Development & Area Sources (PRDAS) for their review of the Tier 4 air dispersion analysis, recommendation, and compliance determination with the applicable rule (1303).
The air modeling and HRA analysis was reviewed and approved for compliance determination by the Planning Dept. (since NOx emission is lower than before based on revised mfgr. guarantee, compliance can be expected).

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

CONTAMINANT	Lbs/day P.R.Offset required,(for the Project)
CO	401
NOx (AS NO2)	391
PM_{10} ($PM_{2.5}$)	113
TGNMOC (AS CH4)	110
SOX (AS SO2)	332

Sensitive Zone Requirements: Not applicable as credits will be provided from the Priority Reserve Account.

Facility Compliance: Form 400-A states that there are no other facilities in SCAQMD jurisdiction operated by the same operator. Compliance can be expected with the applicable rules and regulations of the SCAQMD.

Major Polluting Facility:

Proposed gas turbine(s) is expected to meet the current LAER requirements. NOx and CO emissions are lower than current LAER based on manufacturer's revised emission guarantee.

Gas turbine (s) will be located on an existing and active landfill where LFG fuel is readily available, where no extensive fuel delivery piping required if the fuel is to be brought from far distances that will increase project costs and can have additional environmental impacts. The proposed gas turbine is predicted to have thermal efficiency of about 35% - 37%, at various inlet temperatures of the fuel and full load that is similar or better than the modern IC engines. Gas turbine is capable of operating with as low as 33% methane in LFG (avg. 400 Btu/scf). For Sunshine Canyon LFG facility, average Methane content is 42% (Vol). The gas turbine is expected to have better than 98% destruction efficiency for NMOCs. Based on this information, GT is considered a suitable technology for LFG to energy project, for LFG control, and expected to comply with applicable rules. Therefore, no further alternative analysis is required.

Also, compliance requirements with Major Polluting Facilities – Alternative analysis may be met through the approved CEQA documents. (Other facilities in the District are granted permits for GTs employed for LFGTE technology).

Protection of Visibility:

Not applicable. Sylmar is not near any of the specified Federal Class I area, and estimated NOx and PM10 emissions from each gas turbine is 24 TPY and 3 TPY, respectively, (emission threshold limit >40 TPY NOx and > 15 TPY PM10 emissions).

Compliance through CEQA:

CEQA documents have been reviewed by SCAQMD that serves as a Lead agency for this project (documents prepared by ARCADIS U.S., Inc). Upon completion of CEQA notice and final CEQA certification, initial Title V facility permit will be issued.

Compliance with Reg. XIII can be expected.

RULE 1325: Federal PM2.5 New Source Review Program

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 this new facility, total estimated emissions -71 TPY NOx, 70 TPY SO2 and 20.6 TPY PM2.5.

RULE 1401: Compliance can be expected based on Planning Department staff's review and approval for the revised HRA analysis submitted by the applicant.

For the proposed project, peak cancer risk = 0.07 in a million (resident)
= 0.78 in a million (worker)
Peak acute Index = 0.065
Peak chronic Index = 0.073.

The LFG is pretreated to remove any impurities and particulate matters prior to combustion. Gas turbine combustion is expected to reduce VOCs/TACs by at least 98% (or 20 ppmv as Hexane per NSPS and R1150.1). Therefore, GT combustion process is considered equivalent to other control technologies and, for this specific case, is considered as T-BACT. Source test is also required to demonstrate this control efficiency. Compliance is expected.]

RULE 1401.1: Sunshine Gas Producers, LCC is a new facility that will operate proposed equipment on an existing active landfill site (Sunshine Canyon MSW Landfill, ID 049111). There are no schools within the vicinity of 1000' from the emission source(s). Risk, HIC and HIA values are expected to be in compliance with Rule 1401 (Revised HRA analysis, 07/07/2009, is pending approval from the Planning & Rule Dept.). Compliance can be expected.

REG. XVII: Preventative Significant Deterioration (PSD) :

Rule 1701: General - states this regulation sets forth preconstruction review requirements for stationary sources that emit "attainment air contaminants" and stationary source has a significant emission increase, meets BACT, and source is located within 10 km of a Class I area. The source may be interpreted as "combinations of permitted units, a project, or a Facility, then the potential to emit (PTE) emission limit can be 100 0r 250 TPY.

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 (2) says an unlisted stationary source that emits or has PTE 250 TPY or more……
Therefore, LFGTE, major stationary unlisted source, would be subject to 250 tpy limitation. Estimated emissions of attainment pollutants from the proposed project (5-GTs and a flare) are <251 tpy.

Rule 1704: Exemptions…(a)(4) lists resource recovery project 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.

Rule 1714: Prevention of significant deterioration for greenhouse gases

The owner or operator must obtain a PSD permit for Greenhouse Gases (GHG) pursuant to this rule before beginning actual construction as defined in 40 CFR Part 52.21 (b)(11) of a new major stationary source or major modification to an existing major source as defined in 40 CFR part 52.21 (b)(1) [Major Stationary] and (b)(2) [Major Modification], respectively. Currently EPA has deffered biogenic carbon dioxide (CO2) emissions from bioenergy and other biogenic sources such as this landfill gas to energy project. As such, GHG emission from the proposed project is less than 250 tons per year and CO2e emissions are less than 100,000 tons per year.

Compliance with requirements of Rule 1714 is expected.

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

Sunshine Gas Producers, LLC is considered a major source Title V facility, and has filed an Initial Title-V facility permit A/N 480628. Upon completion of Initial Title V facility permits, draft permit will be sent to the facility for their review and comments, before TV is finalized.

Initial proposed Title V facility permit will be subject to public notice (combined Rule 212/ Title V) and 45-day EPA review, and public and other Governmental agencies' comments.

Potential to emit (PTE) from the proposed LFGTE project (facility) will exceed emission threshold levels for CO (50 TPY limit), NOx (10 TPY limit), and VOC (10 TPY limit).

Potential total HAP emissions (including HCl) are 15.27 TPY (15 TPY from 5-GTs and 0.27 TPY from a flare). This is < 25 TPY total HAP threshold limit. HAP emissions are based on E.F. of 0.014 lbs/MMBtu LFG.

Calculated worst-case inorganic HAP emission for HCl (considering all of the chlorinated compounds present in LFG are completely combusted forming HCl) exceeds 10 TPY. Therefore, this facility is considered a major source of HAPs and will be subject to all applicable NESHAPs.

Compliance with Reg. XXX can be expected upon completion of public notice and review by EPA, CARB, Public and other agencies. Initial Title V facility permit can be issued upon certification of final CEQA documents.

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.

The combustion of the LFG in the proposed gas turbines and the flare will satisfy the requirements of this regulation including but not limited to destruction of TNMOC by 98% or TNMOC concentration in exhaust to less than 20 ppmvd, as hexane at 3%O2.

NSPS Requirements 40CFR Part 60- subpart KKKK

(Stationary Combustion GT > 10 MMBtu/hr)

SOx:

Proposed gas turbine will comply with SO_2 emission standards that GT shall not exceed 0.90 lb/MWh or burn fuel with potential SO_2 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 SO_2 = 3.13 lbs/hr SO_2 / 4.9 MWhr = 0.638 lb/MW < 0.90 lb/MW,
OR
3.13 lbs/hr SO_2 / 43.28 MMBtu/hr = 0.072 lb/MMBtu .
Compliance is expected with subpart KKKK.

NOx:

New turbine firing fuels < 50 MMBtu/hr (HHV) 96 ppmv NOx at 15% O2 or 700 ng/J

other than natural gas, and ≤850 MMBtu/hr of useful output (5.5 lb/MWh). Electric generating

Gas turbine shall meet LAER limit of 25 ppmv NOx at 15% O2 (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 must comply with start-up, shutdown and malfunction (SSM), deviation reporting (§63.1965) and notification (§63.1980) requirements of this regulation. Applicant is required/conditioned to comply with the above requirement as part of their proposed Title V program. Compliance can be expected.

NESHAPS - 40CFR Part 63- Subpart YYYY

LFGTE facility's PTE for any single HAP is estimated at > 10 TPY (see discussion under Reg. XXX- title V) 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 applicable for combustion gas turbines.

Lean premix gas-fired stationary new gas turbine construction is subject to the following emission limitations requirement;
§63.6100, Table 1 – Formaldehyde concentration of ≤ 91 ppbvd at 15% O2.
§63.6150, Table 6 – Annually report (1) fuel flow rate, 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 is expected. A source test condition requires Formaldehyde emission determination.

Compliance Assurance Monitoring (CAM) - 40CFR Part 64

Applicant has submitted A/N 518031 to demonstrate compliance with CAM requirements for control of NMHC emissions from combusting LFG in gas turbines and an ultra low emission enclosed LFG flare. This plan has been evaluated and additional conditions to ensure compliance with CAM requirements have been imposed in both the gas turbines and the flare proposed permits. Compliance with the requirements of this regulation is expected.

40CFR Parts 52,: Prevention of Significant Deterioration (PSD) of Air Quality

CO2e emissions from this source are mainly from biogenic sources, and EPA has currently deferred CO2 emissions from biogenic sources from PSD applicability determination under section 52.219(b)(49). As such, GHG emission from the proposed project is less than 250 tons per year and CO2e emissions are less than 100,000 tons per year.

Acid Rain Program - 40CFR Part 72

This is a "non-utility Unit" and do not supply more than 25 MWe output to any power distribution system for sale (Gross 24.5 MWe will be produced by five GTs). Therefore, exempt from the provisions of 40CFR Part 72.

CONCLUSION/RECOMMENDATION:

The above-proposed equipment for the LFGTE project is expected to comply with the applicable AQMD's Rules and Regulations and federal rules requirements.
Permit(s) to Construct with proposed conditions is (are) recommended upon completion of required public notices (Rule 212 and Title V), EPA and public commenting period and certification of final CEQA.

SGP is currently considered a major HAP facility based on projected single pollutant emission (Hydrochloric Acid - HCl PTE > 10 TPY). This will be verified based on source tests results. Applicable NESHAP requirements are addressed under Title V permit, Section J- Air Toxics.