

**MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY  
AIR QUALITY DIVISION**

November 30, 2021

**PERMIT TO INSTALL  
118-20**

**ISSUED TO**  
Energy Developments Coopersville, LLC

**LOCATED AT**  
15550 & 15362 68<sup>th</sup> Avenue  
Coopersville, Michigan 49404

**IN THE COUNTY OF**  
Ottawa

**STATE REGISTRATION NUMBER**  
N3294

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environment, Great Lakes, and Energy. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203: <b>August 20, 2021</b>	
DATE PERMIT TO INSTALL APPROVED: <b>November 30, 2021</b>	SIGNATURE: 
DATE PERMIT VOIDED:	SIGNATURE:
DATE PERMIT REVOKED:	SIGNATURE:

**PERMIT TO INSTALL**

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## COMMON ACRONYMS

AQD	Air Quality Division
BACT	Best Available Control Technology
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
COMS	Continuous Opacity Monitoring System
Department/department/EGLE	Michigan Department of Environment, Great Lakes, and Energy
EU	Emission Unit
FG	Flexible Group
GACS	Gallons of Applied Coating Solids
GC	General Condition
GHGs	Greenhouse Gases
HVLP	High Volume Low Pressure*
ID	Identification
IRSL	Initial Risk Screening Level
ITSL	Initial Threshold Screening Level
LAER	Lowest Achievable Emission Rate
MACT	Maximum Achievable Control Technology
MAERS	Michigan Air Emissions Reporting System
MAP	Malfunction Abatement Plan
MSDS	Material Safety Data Sheet
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standard for Hazardous Air Pollutants
NSPS	New Source Performance Standards
NSR	New Source Review
PS	Performance Specification
PSD	Prevention of Significant Deterioration
PTE	Permanent Total Enclosure
PTI	Permit to Install
RACT	Reasonable Available Control Technology
ROP	Renewable Operating Permit
SC	Special Condition
SCR	Selective Catalytic Reduction
SNCR	Selective Non-Catalytic Reduction
SRN	State Registration Number
TBD	To Be Determined
TEQ	Toxicity Equivalence Quotient
USEPA/EPA	United States Environmental Protection Agency
VE	Visible Emissions

\*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 psig.

### POLLUTANT / MEASUREMENT ABBREVIATIONS

acfm	Actual cubic feet per minute
BTU	British Thermal Unit
°C	Degrees Celsius
CO	Carbon Monoxide
CO <sub>2</sub> e	Carbon Dioxide Equivalent
dscf	Dry standard cubic foot
dscm	Dry standard cubic meter
°F	Degrees Fahrenheit
gr	Grains
HAP	Hazardous Air Pollutant
Hg	Mercury
hr	Hour
HP	Horsepower
H <sub>2</sub> S	Hydrogen Sulfide
kW	Kilowatt
lb	Pound
m	Meter
mg	Milligram
mm	Millimeter
MM	Million
MW	Megawatts
NMOC	Non-Methane Organic Compounds
NO <sub>x</sub>	Oxides of Nitrogen
ng	Nanogram
PM	Particulate Matter
PM10	Particulate Matter equal to or less than 10 microns in diameter
PM2.5	Particulate Matter equal to or less than 2.5 microns in diameter
pph	Pounds per hour
ppm	Parts per million
ppmv	Parts per million by volume
ppmw	Parts per million by weight
psia	Pounds per square inch absolute
psig	Pounds per square inch gauge
scf	Standard cubic feet
sec	Seconds
SO <sub>2</sub>	Sulfur Dioxide
TAC	Toxic Air Contaminant
Temp	Temperature
THC	Total Hydrocarbons
tpy	Tons per year
µg	Microgram
µm	Micrometer or Micron
VOC	Volatile Organic Compounds
yr	Year

## GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environment, Great Lakes, and Energy, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to Rule 210 (R 336.1210), operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to Rule 219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of Rule 219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environment, Great Lakes, and Energy. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal condition or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of Rule 301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with Rule 303 (R 336.1303). **(R 336.1301)**
  - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
  - b) A visible emission limit specified by an applicable federal new source performance standard.
  - c) A visible emission limit specified as a condition of this Permit to Install.
12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2). **(R 336.1370)**
13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001. **(R 336.2001)**

## EMISSION UNIT SPECIAL CONDITIONS

### EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date / Modification Date	Flexible Group ID
EUENGINE1	This emission unit, and any replacement of this unit as applicable under R 336.1285(2)(a)(vi), is for a CAT 3516 reciprocating internal combustion engine rated at 1,148 bhp fueled with treated landfill/digester gas to produce electricity.	06-21-1994	FGENGINES
EUENGINE3	This emission unit, and any replacement of this unit as applicable under R 336.1285(2)(a)(vi), is for a CAT 3516 reciprocating internal combustion engine rated at 1,148 bhp fueled with treated landfill/digester gas to produce electricity.	06-21-1994	FGENGINES
EUENGINE4	This emission unit, and any replacement of this unit as applicable under R 336.1285(2)(a)(vi), is for a CAT 3516 reciprocating internal combustion engine rated at 1,148 bhp fueled with treated landfill/digester gas to produce electricity.	06-21-1994, Replaced 02-03-2014	FGENGINES
EUENGINE5	This emission unit, and any replacement of this unit as applicable under R 336.1285(2)(a)(vi), is for a CAT 3516 reciprocating internal combustion engine rated at 1,148 bhp fueled with treated landfill/digester gas to produce electricity.	06-21-1994	FGENGINES
EUENGINE6	This emission unit, and any replacement of this unit as applicable under R 336.1285(2)(a)(vi), is for a CAT 3516 reciprocating internal combustion engine rated at 1,148 bhp fueled with treated landfill/digester gas to produce electricity.	06-21-1994, Replaced 05-12-2020	FGENGINES
EUENGINE7	This emission unit, and any replacement of this unit as applicable under R 336.1285(2)(a)(vi), is for a CAT 3520 reciprocating internal combustion engine rated at 2,233 bhp fueled with treated landfill/digester gas to produce electricity.	Aug 2014	FGENGINES, FGRICENSPS, FGRICEMACT
EUOPENFLARE	A 1,300 scfm open utility flare used for flaring excess landfill gas.		NA

Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1291.

**EUOPENFLARE  
 EMISSION UNIT CONDITIONS**

**DESCRIPTION**

A landfill gas open utility flare with a rated design capacity of 1,300 scfm, used to control excess landfill gas or when the landfill gas to energy plant is down.

**Flexible Group ID:** NA

**POLLUTION CONTROL EQUIPMENT**

NA

**I. EMISSION LIMIT(S)**

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period / Operating Scenario</b>	<b>Equipment</b>	<b>Monitoring / Testing Method</b>	<b>Underlying Applicable Requirements</b>
1. CO	0.37 lb/MMBTU	Hourly	EUOPENFLARE	SC V.1, SC VI.2, SC VI.3	R 336.1205(1)(a), R 336.2804

**II. MATERIAL LIMIT(S)**

<b>Material</b>	<b>Limit</b>	<b>Time Period / Operating Scenario</b>	<b>Equipment</b>	<b>Monitoring / Testing Method</b>	<b>Underlying Applicable Requirements</b>
1. Net heating value of landfill gas	≥ 200 BTU/scf for non-assisted flares	Hourly	EUOPENFLARE	SC V.1, SV VI.3	R 336.1224, R 336.1225, R 336.1702

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. No later than 60 days after permit issuance, the permittee shall submit to the AQD District Supervisor, for review and approval, a preventative maintenance / malfunction abatement plan (PM / MAP) for EUOPENFLARE. After approval of the PM / MAP by the AQD District Supervisor, the permittee shall not operate EUOPENFLARE unless the PM / MAP, or an alternate plan approved by the AQD District Supervisor, is implemented and maintained. The plan shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the plan shall include:
  - a) Identification of the equipment and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
  - b) Description of the items or conditions to be inspected and frequency of the inspections or repairs.
  - c) Identification of the equipment and, if applicable, air-cleaning device, operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures.
  - d) Identification of the major replacement parts that shall be maintained in inventory for quick replacement.
  - e) A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

If at any time the PM / MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the permittee shall amend the PM / MAP within 45 days after such an event occurs. The permittee shall also amend the PM / MAP within 45 days, if new equipment is installed or upon request from the AQD District Supervisor. The permittee shall submit the PM / MAP and any amendments to the PM / MAP to the AQD District Supervisor for review and approval. If the AQD does not notify the permittee within 90 days of submittal, the PM / MAP or amended PM / MAP shall be considered approved. Until an amended plan is approved, the permittee shall implement corrective procedures or operational changes to achieve compliance with all applicable emission limits. **(R 336.1911, R 336.1912)**

2. The permittee shall operate EUOPENFLARE at all times when the collected gas is routed to it. **(R 336.1224, R 336.1225, R 336.1702)**
3. The permittee shall operate EUOPENFLARE with no visible emissions, as determined by the methods specified in 40 CFR 60.18(f), except for periods not to exceed a total of 5 minutes during any 2 consecutive hours. **(R 336.1224, R 336.1225, R 336.1702)**
4. The permittee shall operate EUOPENFLARE with a pilot flame present at all times, as determined by the methods specified in 40 CFR 60.18(f). **(R 336.1224, R 336.1225, R 336.1702)**
5. Non-assisted flares shall be designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR 60.18(f)(4), less than 18.3 m/sec (60 ft/sec), except as provided in 40 CFR 60.18(c)(4)(ii) and (iii).
  - a) Non-assisted flares designed for and operated with an exit velocity, equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec) are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 BTU/scf).
  - b) Non-assisted flares designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR 60.18(f)(4) less than the velocity,  $V_{max}$ , as determined by the method specified in 40 CFR 60.18(f)(5), and less than 122 m/sec (400 ft/sec) are allowed.  
**(R 336.1224, R 336.1225, R 336.1702)**
6. The permittee shall install, calibrate, maintain, and operate, according to the manufacturer's specifications, a heat sensing device for EUOPENFLARE, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame for EUOPENFLARE. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702)**
7. The permittee shall install, calibrate, maintain, and operate according to the manufacturer's specifications, a landfill gas flow rate measuring device for EUOPENFLARE to record the flow to or bypass of the flare at least every 15 minutes. **(R 336.1205, R 336.1225, R 336.1702)**

#### **IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The nameplate capacity of EUOPENFLARE shall not exceed 1,300 scfm, as specified by the equipment manufacturer. **(R 336.1205(1)(a), R 336.1224, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**

#### **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall verify the net heating value of the combusted landfill gas for EUOPENFLARE. **(R 336.1205, R 336.1225, R 336.1702)**
2. Within 45 days of permit issuance, the permittee shall verify the hydrogen sulfide ( $H_2S$ ) or total reduced sulfur (TRS) content of the landfill gas burned in EUOPENFLARE monthly by gas sampling (e.g. Draeger Tubes, Tedlar Sampling Bags, SILCO and/or SUMMA canisters, etc.) and semi-annually by gas sampling using an EPA approved method and laboratory analysis, at the owner's expense, in accordance with Department requirements. If at any time, the  $H_2S$  (TRS equivalent) concentration of the landfill gas sample exceeds 330 ppmv, the permittee shall sample and record the  $H_2S$  (TRS equivalent) concentration of the landfill gas weekly and shall review all operating and maintenance activities for the landfill gas collection and treatment system along with keeping records of corrective actions taken. Once the  $H_2S$  (TRS equivalent) concentration

of the landfill gas (determined from at least 4 weekly samples) is maintained below 330 ppmv the permittee may resume monthly monitoring and recordkeeping. Permittee may use H<sub>2</sub>S (TRS equivalent) testing conducted at the engines when the flare is not operating. No less than 30 days prior to the initial test for each type of gas sampling, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to the first test for each type of gas sampling. Thereafter, the permittee shall submit a test plan upon the request of the AQD District Supervisor or if any changes are made to the approved testing protocol. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205, R 336.1224, R 336.1225, R 336.2001, R 336.2003, R 336.2004, R 336.2803, R 336.2804)**

## **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor by the 30th day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.2803, R 336.2804)**
2. The permittee shall continuously monitor and record the gas flow rate for EUOPENFLARE. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.2803, R 336.2804)**
3. The permittee shall maintain a record the following information for EUOPENFLARE:
  - a) All visible emission readings, heat content determination, flow rate or bypass flow rate measurements, and exit velocity determinations made during the performance test as specified in 40 CFR 60.18, continuous records of the flare pilot flame or flare flame monitoring, and records of all periods of operations during which the pilot flame of the flare flame is absent.The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.2803, R 336.2804)**
4. The permittee shall keep up-to-date, readily accessible records of all control system exceedances of the Process/Operational Restrictions. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.2803, R 336.2804)**
5. The permittee shall keep, in a satisfactory manner, all records related to, or as required by, the PM / MAP for EUOPENFLARE. **(R 336.1911, R 336.1912)**
6. The permittee shall keep, in a satisfactory manner, records of gas sampling and analysis for H<sub>2</sub>S or TRS concentration in the landfill gas routed to EUOPENFLARE. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.2803, R 336.2804)**
7. The permittee shall calculate and keep, in a satisfactory manner, records of the SO<sub>2</sub> emission rates from EUOPENFLARE using the equation in Appendix 1 or other method as approved by the AQD District Supervisor. The calculations shall utilize, at a minimum, monthly gas sampling data collected SC V.2, the monthly gas usage, monthly hours of operation, and the ratio of total sulfur to sulfur as H<sub>2</sub>S from the most recent laboratory test. All records shall be kept on file at the facility and make them available to the Department upon request. **(R 336.1205, R 336.2803, R 336.2804)**
8. The permittee shall calculate and keep, in a satisfactory manner, records of monthly and 12-month rolling CO mass emissions for EUOPENFLARE. Calculations shall be performed according to Appendix 1 or other method as approved by the AQD Supervisor. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1205, R 336.2803, R 336.2804)**
9. The permittee shall keep, in a satisfactory manner, records of the monthly hours of operation for EUOPENFLARE. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1205, R 336.1225, R 336.2803, R 336.2804)**

**VII. REPORTING**

NA

**VIII. STACK/VENT RESTRICTION(S)**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

<b>Stack &amp; Vent ID</b>	<b>Maximum Exhaust Diameter / Dimensions (inches)</b>	<b>Minimum Height Above Ground (feet)</b>	<b>Underlying Applicable Requirements</b>
1. SVOPENFLARE	12.0	35.0	R 336.1225, R 336.2803, R 336.2804

**IX. OTHER REQUIREMENT(S)**

NA

## FLEXIBLE GROUP SPECIAL CONDITIONS FLEXIBLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

<b>Flexible Group ID</b>	<b>Flexible Group Description</b>	<b>Associated Emission Unit IDs</b>
FGENGINES	Reciprocating internal combustion engine(s) fueled with treated landfill/digester gas and used to produce electricity.	EUENGINE1, EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6, EUENGINE7
FGRICENSPS	Non-emergency engine(s) greater than 500 hp, fueled with landfill/digester gas. Engine(s) ordered after June 12, 2006, and manufactured on or after July 1, 2007.	EUENGINE7
FGRICEMACT	New and reconstructed non-emergency engines greater than 500 hp fueled with landfill/digester gas, located at a major source of HAPs. Construction or reconstruction commenced on or after December 19, 2002.	EUENGINE7

**FGENGINES  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION**

Reciprocating internal combustion engine(s) fueled with treated landfill gas and used to produce electricity. This flexible group includes the emission units below and any subsequent replacements for those units as applicable under R 336.1285(a)(vi).

**Emission Unit:** EUENGINE1, EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6, EUENGINE7

**POLLUTION CONTROL EQUIPMENT**

NA

**I. EMISSION LIMIT(S)**

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period / Operating Scenario</b>	<b>Equipment</b>	<b>Monitoring / Testing Method</b>	<b>Underlying Applicable Requirements</b>
1. NOx	4.56 pph (Limit applies to each engine)	Hourly	EUENGINE1, EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6	SC V.1, SC VI.5	R 336.1205(1)(a), R 336.2803, R 336.2804
2. NOx	4.94 pph	Hourly	EUENGINE7	SC V.1, SC VI.5	R 336.1205(1)(a), R 336.2803, R 336.2804
3. CO	7.8 pph (Limit applies to each engine)	Hourly	EUENGINE1, EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6	SC V.1, SC VI.5	R 336.1205(1)(a), R 336.2804
4. CO	16.3 pph	Hourly	EUENGINE7	SC V.1, SC VI.5	R 336.1205(1)(a), R 336.2804
5. VOC (Includes formaldehyde)	1.7 pph (Limit applies to each engine)	Hourly	EUENGINE1, EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6	SC V.1, SC VI.5	R 336.1205(1)(a), R 336.1702(a)
6. VOC (Includes formaldehyde)	3.2 pph	Hourly	EUENGINE7	SC V.1, SC VI.5	R 336.1205(1)(a), R 336.1702(a)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
7. SO2	1.1 pph (Limit applies to each engine)	Hourly	EUENGINE1, EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6	SC V.1, SC VI.3, SC VI.5	R 336.1205(1)(a), R 336.2803, R 336.2804
8. SO2	1.91 pph	Hourly	EUENGINE7	SC V.1, SC VI.3, SC VI.5	R 336.1205(1)(a), R 336.2803, R 336.2804
9. Formaldehyde	0.76 pph (Limit applies to each engine)	Hourly	EUENGINE1, EUENGINE3, EUENGINE4, EUENGINE5, EUENGINE6	SC V.2, SC VI.5	R 336.1225(1)
10. Formaldehyde	2.1 pph	Hourly	EUENGINE7	SC V.2, SC VI.5	R 336.1225(1)

**II. MATERIAL LIMIT(S)**

NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall only burn treated landfill gas in FGENGINES. **(R 336.1205, R 336.1225, R 336.1331, R 336.1702)**
2. No later than 60 days after permit issuance, the permittee shall submit to the AQD District Supervisor, for review and approval, a malfunction abatement/preventative maintenance plan for FGENGINES. After approval of the malfunction abatement/preventative maintenance plan by the AQD District Supervisor, the permittee shall not operate FGENGINES unless the malfunction abatement/preventative maintenance plan, or an alternate plan approved by the AQD District Supervisor, is implemented and maintained. The plan shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the plan shall include:
  - a) Identification of the equipment and, if applicable, air-cleaning device, and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
  - b) Description of the items or conditions to be inspected and frequency of the inspections or repairs.
  - c) Identification of the equipment and, if applicable, air-cleaning device, operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures.
  - d) Identification of the major replacement parts that shall be maintained in inventory for quick replacement.
  - e) A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits.

If the plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the plan within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the malfunction abatement/preventative maintenance plan to be inadequate, the AQD District Supervisor may request modification of the plan to address those inadequacies. **(R 336.1911, R 336.1912)**

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall not operate each engine of FGENGINES unless an air-to-fuel ratio controller is installed, maintained and operated in a satisfactory manner. **(R 336.1702, R 336.1910)**

2. The design capacity of EUENGINE1, EUENGINE3, EUENGINE4, EUENGINE5, and EUENGINE6 shall not exceed 1,148 hp each, as specified by the equipment manufacturer. **(R 336.1205, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**
3. The design capacity of EUENGINE7 shall not exceed 2,242 hp, as specified by the equipment manufacturer. **(R 336.1205, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**
4. The permittee shall equip and maintain each engine in FGENGINES with a device to monitor and record the daily fuel usage. **(R 336.1205, R 336.1225, R 336.1702)**
5. The permittee shall equip and maintain each engine of FGENGINES with non-resettable hours meters to continuously monitor and record the operating hours. **(R 336.1205(1)(a))**

#### **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. Within 180 days of permit issuance and every 5 years from the date of completion of the most recent stack test, the permittee shall verify NO<sub>x</sub>, CO, VOC, and SO<sub>2</sub> emission rates from each engine in FGENGINES, by testing at owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in the table below:

<b>Pollutant</b>	<b>Test Method Reference</b>
NO <sub>x</sub>	40 CFR Part 60, Appendix A
CO	40 CFR Part 60, Appendix A
VOC (Includes formaldehyde)	40 CFR Part 60, Appendix A; or Method 320 of Appendix A of 40 CFR Part 63
SO <sub>2</sub>	40 CFR Part 60, Appendix A

An alternate method, or a modification to the approved EPA Method, may be specified in an AQD approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1205, R 336.1225, R 336.2001, R 336.2003, R 336.2004, R 336.2803, R 336.2804)**

2. Within 180 days of permit issuance and every 5 years from the date of completion of the most recent stack test, the permittee shall verify formaldehyde emission rates from each engine in FGENGINES, by testing at owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in the table below:

<b>Pollutant</b>	<b>Test Method Reference</b>
Formaldehyde	40 CFR Part 60, Appendix A; or Method 320 of Appendix A of 40 CFR Part 63

An alternate method, or a modification to the approved EPA Method, may be specified in an AQD approved Test Protocol. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing, including any modifications to the method in the test protocol that are proposed after initial submittal. Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(R 336.1225, R 336.2001, R 336.2003, R 336.2004)**

3. Within 45 days of permit issuance, the permittee shall verify the hydrogen sulfide (H<sub>2</sub>S) or total reduced sulfur (TRS) content of the landfill gas burned in FGENGINES monthly by gas sampling (e.g. Draeger Tubes, Tedlar Sampling Bags, SILCO and/or SUMMA canisters, etc.) and semi-annually by gas sampling using an EPA approved method and laboratory analysis, at the owner's expense, in accordance with Department requirements. If at any time, the H<sub>2</sub>S (TRS equivalent) concentration of the landfill gas sample exceeds 330 ppmv, the permittee shall sample and record the H<sub>2</sub>S (TRS equivalent) concentration of the landfill gas weekly and shall review all operating and maintenance activities for the landfill gas collection and treatment system along with keeping records of corrective actions taken. Once the H<sub>2</sub>S (TRS equivalent) concentration of the landfill gas (determined from at least 4 weekly samples) is maintained below 330 ppmv for one week after an exceedance, the permittee may resume monthly monitoring and recordkeeping. No less than 30 days prior to the initial test for each type of gas sampling, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to the first test for each type of gas sampling. Thereafter, the permittee shall submit a test plan upon the request of the AQD District Supervisor or if any changes are made to the approved testing protocol. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205, R 336.1225, R 336.2001, R 336.2003, R 336.2004, R 336.2803, R 336.2804)**

## **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor and make them available by the last day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. **(R 336.1205, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**
2. The permittee shall continuously monitor and record, in a satisfactory manner, the landfill gas usage for FGENGINES. **(R 336.1205, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**
3. The permittee shall keep, in a satisfactory manner, records of gas sampling and analysis for H<sub>2</sub>S or TRS concentration in the landfill gas routed to FGENGINES. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.2803, R 336.2804)**
4. The permittee shall calculate and keep, in a satisfactory manner, records of the SO<sub>2</sub> emission rates from each engine in FGENGINES using the equation in Appendix 1 or other method as approved by the AQD District Supervisor. The calculations shall utilize, at a minimum, monthly gas sampling data collected SC V.3, the monthly gas usage, monthly hours of operation, and the ratio of total sulfur to sulfur as H<sub>2</sub>S from the most recent laboratory test. All records shall be kept on file at the facility and make them available to the Department upon request. **(R 336.1205, R 336.2803, R 336.2804)**
5. The permittee shall maintain the following record for each engine in FGENGINES. The following information shall be recorded and kept on file at the facility:
  - a) Engine manufacturer.
  - b) Date engine was manufactured.
  - c) Engine model number.
  - d) Engine horsepower.
  - e) Engine serial number.
  - f) Engine specification sheet.
  - g) Date of initial startup of the engine.
  - h) Date engine was removed from service at this stationary source.

All of the above information shall be stored in a format acceptable to the AQD District Supervisor. **(R 336.1205, R 336.1225, R 336.1301, R 336.1331, R 336.1702, R 336.1910, R 336.1911, R 336.1912, R 336.2803, R 336.2804)**

6. The permittee shall maintain records of all information necessary for all notifications and reports for each engine in FGEngines, as specified in these special conditions as well as that information necessary to demonstrate compliance with the emission limits of this permit. This information shall include, but shall not be limited to the following:
- a) Compliance tests and any testing required under the special conditions of this permit.
  - b) Monitoring data for the hours of operation, volumetric flow rate and landfill gas usage.
  - c) Calculated amount of landfill gas combusted in each engine on a monthly and 12-month rolling basis.
  - d) Hours of operation on a monthly and 12-month rolling basis.
  - e) Monthly average Btu content of the landfill gas burned.
  - f) Manufacturer's data, specifications, and operating and maintenance procedures.
  - g) Maintenance activities conducted according to the PM/Map.
  - h) All calculations necessary to show compliance with the limits contained in this permit.

All of the above information shall be stored in a format acceptable to the AQD District Supervisor. (R 336.1205, R 336.1225, R 336.1301, R 336.1331, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, R 336.2803, R 336.2804)

## VII. REPORTING

1. The permittee shall notify the AQD District Supervisor of an engine change-out and submit a description of the engine and acceptable emissions data to show that the alternate engine is equivalent-emitting or lower-emitting. The data shall be submitted within 30-days of the engine change out. (R 336.1205, R 336.1702, R 336.1911, R 336.2803, R 336.2804)

## VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter / Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVEUENGINE1	12.0	60	R 336.1225, R 336.2803, R 336.2804
2. SVEUENGINE3	12.0	60	R 336.1225, R 336.2803, R 336.2804
3. SVEUENGINE4	12.0	60	R 336.1225, R 336.2803, R 336.2804
4. SVEUENGINE5	12.0	60	R 336.1225, R 336.2803, R 336.2804
5. SVEUENGINE6	12.0	60	R 336.1225, R 336.2803, R 336.2804
6. SVEUENGINE7	14.5	60	R 336.1225, R 336.2803, R 336.2804

## IX. OTHER REQUIREMENT(S)

1. Within 180 days of permit issuance or as approved in writing by the AQD District Supervisor, the minimum stack height above ground level listed in SC VIII.1-6 shall be constructed. (R 336.1225, R 336.2803, R 336.2804)

### Footnotes:

<sup>1</sup> This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

**FGRICENSPS  
 FLEXIBLE GROUP CONDITIONS**

**DESCRIPTION**

Non-emergency engine(s) greater than 500 hp, fueled with landfill gas. Engine(s) ordered after June 12, 2006, and manufactured on or after July 1, 2007.

**Emission Unit:** EUENGINE7

**POLLUTION CONTROL EQUIPMENT**

NA

**I. EMISSION LIMIT(S)**

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period / Operating Scenario</b>	<b>Equipment</b>	<b>Monitoring / Testing Method</b>	<b>Underlying Applicable Requirements</b>
1. NOx	3.0 g/hp-hr OR 220 ppmvd at 15% O <sub>2</sub>	Hourly	Each engine in FGRICENSPS	SC V.1	40 CFR 60.4233(e) Table 1 to Subpart JJJJ of Part 60
2. CO	5.0 g/hp-hr OR 610 ppmvd at 15% O <sub>2</sub>	Hourly	Each engine in FGRICENSPS	SC V.1	40 CFR 60.4233(e) Table 1 to Subpart JJJJ of Part 60
3. VOC*	1.0 g/hp-hr OR 80 ppmvd at 15% O <sub>2</sub>	Hourly	Each engine in FGRICENSPS	SC V.1	40 CFR 60.4233(e) Table 1 to Subpart JJJJ of Part 60

\*per the NSPS, formaldehyde is not included

**II. MATERIAL LIMIT(S)**

NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. The permittee shall operate and maintain each engine in FGRICENSPS such that it meets the emission limits established, over the entire life of the engine. **(40 CFR 60.4234, 40 CFR 60.4243(b))**
2. If the permittee purchased a non-certified engine or a certified engine operating in a non-certified manner, the permittee shall keep a maintenance plan for each engine in FGRICENSPS and shall, to the extent practicable, maintain and operate each engine in a manner consistent with good air pollution control practice for minimizing emissions. **(40 CFR 60.4243(b))**

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The permittee shall equip and maintain each engine in FGRICENSPS with non-resettable hours meters to track the operating hours. **(40 CFR 60.4243)**

#### **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall conduct performance tests, except as provided in 40 CFR 60.4243(b), for each engine in FGRICENSPS within one year after startup of the engine and every 8760 hours of operation (as determined through the use of a non-resettable hour meter) or three years, whichever occurs first, to demonstrate compliance with the emission limits in 40 CFR 60.4233(e). If a performance test is required, the performance tests shall be conducted according to 40 CFR 60.4244. No less than 30 days prior to any testing, the permittee shall submit a complete test plan to the AQD Technical Programs Unit and District Office. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD Technical Programs Unit and District Office within 60 days following the last date of the test. **(40 CFR 60.8, 40 CFR 60.4243, 40 CFR 60.4244, 40 CFR 60.4245, 40 CFR Part 60 Subpart JJJJ)**

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. If the permittee purchased a non-certified engine or a certified engine operating in a non-certified manner, the permittee shall keep a maintenance plan and records of conducted maintenance for each engine in FGRICENSPS and shall, to the extent practicable, maintain and operate each engine in a manner consistent with good air pollution control practice for minimizing emissions. **(40 CFR 60.4243(b))**

#### **VII. REPORTING**

1. The permittee shall submit an initial notification as required by 40 CFR 60.7(a)(1) for each engine in FGRICENSPS if the engine(s) installed is/are not certified by an engine manufacturer to meet the emission standards in 40 CFR 60.4231. The notification shall include the information below, as specified in 40 CFR 60.4245 (c)(1) through (5):
  - a) Name and address of the owner or operator. **(40 CFR 60.4245(c)(1))**
  - b) The address of the affected source. **(40 CFR 60.4245(c)(2))**
  - c) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement. **(40 CFR 60.4245(c)(3))**
  - d) Emission control equipment. **(40 CFR 60.4245(c)(4))**
  - e) Fuel used. **(40 CFR 60.4245(c)(5))**

The permittee shall submit the initial notification to the AQD District Supervisor in an acceptable format within 30 days of commencing construction of any engine in FGRICENSPS. **(40 CFR Part 60 Subpart JJJJ)**

#### **VIII. STACK/VENT RESTRICTION(S)**

NA

#### **IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with all applicable provisions of the New Source Performance Standards, as specified in 40 CFR Part 60, Subpart A and Subpart JJJJ, as they apply to each engine in FGRICENSPS. **(40 CFR Part 60 Subparts A and JJJJ)**

#### **Footnotes:**

- <sup>1</sup> This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

<b>FGRICEMACT FLEXIBLE GROUP CONDITIONS</b>
-------------------------------------------------

**DESCRIPTION**

New and reconstructed non-emergency engines greater than 500 hp fueled with landfill/digester gas, located at a major source of HAPs, where construction or reconstruction commenced on or after December 19, 2002.

**Emission Unit:** EUENGINE7

**POLLUTION CONTROL EQUIPMENT**

NA

**I. EMISSION LIMIT(S)**

NA

**II. MATERIAL LIMIT(S)**

NA

**III. PROCESS/OPERATIONAL RESTRICTION(S)**

1. Each engine in FGRICEMACT shall operate in a manner which reasonably minimizes HAP emissions. **(40 CFR 63.6625(c))**
2. Each engine in FGRICEMACT shall operate in a manner which minimizes time spent at idle during startup and minimize the startup time to a period needed for appropriate and safe loading of each engine, not to exceed 30 minutes. **(40 CFR 63.6625(h))**

**IV. DESIGN/EQUIPMENT PARAMETER(S)**

1. The engines in FGRICEMACT shall equip and maintain separate fuel meters to monitor and record the daily fuel usage and volumetric flow rate of each fuel used. **(40 CFR 63.6625(c))**

**V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

NA

**VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The engines in FGRICEMACT, which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, must monitor and record the daily fuel usage with separate fuel meters to measure the volumetric flow rate of each fuel. **(40 CFR 63.6625(c))**

## **VII. REPORTING**

1. The permittee shall submit an annual report in accordance with Table 7 of 40 CFR Part 63, Subpart ZZZZ to the appropriate AQD District Office by March 15 for the reporting period from January 1 to December 31. The following information shall be included in this annual report: **(40 CFR 63.6650(g), 40 CFR 63.6650(b)(5))**
  - a) The fuel flow rate and the heating values that were used in the permittee's calculations to determine the gross heat input on an annual basis. Also, the permittee must demonstrate that the percentage of heat input provided by landfill gas or digester gas is equivalent to 10% or more of the total fuel consumption on an annual basis. **(40 CFR 63.6650(g)(1))**
  - b) The operating limits provided in the permittee's federally enforceable permit, and any deviation from these limits. **(40 CFR 63.6650(g)(2))**
  - c) Any problems or errors suspected from the fuel flow rate meters. **(40 CFR 63.6650(g)(3))**

## **VIII. STACK/VENT RESTRICTION(S)**

NA

## **IX. OTHER REQUIREMENT(S)**

1. The permittee shall comply with the provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR, Part 63, Subpart A and Subpart ZZZZ, as they apply to each engine in FGRICEMACT. **(40 CFR Part 63 Subparts A and ZZZZ)**

### **Footnotes:**

<sup>1</sup> This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

## FGFACILITY CONDITIONS

**DESCRIPTION:** The following conditions apply source-wide to all process equipment including equipment covered by other permits, grand-fathered equipment, and exempt equipment.

### POLLUTION CONTROL EQUIPMENT

NA

#### I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. SO <sub>2</sub>	45.8 tpy	12-month rolling time period as determined at the end of each calendar month	FGFACILITY	SC VI.2	R 336.1205(1)(a) & (b)
2. CO	290 tpy	12-month rolling time period as determined at the end of each calendar month	FGFACILITY	SC VI.3	R 336.1205(1)(a) & (3)
3. NO <sub>x</sub>	130 tpy	12-month rolling time period as determined at the end of each calendar month	FGFACILITY	SC VI.4	R 336.1205(1)(a) & (3)

#### II. MATERIAL LIMIT(S)

Material	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. Landfill Gas	1,581.53 MMscf per year	12-month rolling time period as determined at the end of each calendar month	FGFACILITY	SC VI.5	R 336.1205(1)(a)

#### III. PROCESS/OPERATIONAL RESTRICTION(S)

NA

#### IV. DESIGN/EQUIPMENT PARAMETER(S)

NA

#### V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. (R 336.1201(3))

NA

#### VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. (R 336.1201(3))

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor by the 30th day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. **(R 336.1205)**
2. The permittee shall calculate and keep, in a satisfactory manner, records of monthly and 12-month rolling total SO<sub>2</sub> mass emissions for FGFACILITY. Calculations shall be performed according to Appendix 1 or other method as approved by the AQD District Supervisor. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1205(1)(a) & (b))**
3. The permittee shall calculate and keep, in a satisfactory manner, records of monthly and 12-month rolling total CO mass emissions for FGFACILITY. Calculations shall be performed according to Appendix 1 or other method as approved by the AQD District Supervisor and using the most recent operating parameters and tested emission factors. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1205(1)(a) & (3))**
4. The permittee shall calculate and keep, in a satisfactory manner, records of monthly and 12-month rolling total NO<sub>x</sub> mass emissions for FGFACILITY. Calculations shall be performed according to Appendix 1 or other method as approved by the AQD District Supervisor and using the most recent operating parameters and tested emission factors. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1205(1)(a) & (3))**
5. The permittee shall continuously monitor and record the gas flow rate for FGFACILITY as required in SC II.1. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.2803, R 336.2804)**

**VII. REPORTING**

NA

**VIII. STACK/VENT RESTRICTION(S)**

NA

**IX. OTHER REQUIREMENT(S)**

NA

## APPENDIX 1 Procedures for Calculating Emissions

The permittee shall demonstrate compliance with the emission limits in this permit by using the following equations, and the most recent vendor data, stack testing, and/or gas testing.

### **Vendor Data or Stack Testing**

The permittee shall use emission factors from vendor data or from source specific testing, as available for the engines and flares at the facility. The permittee shall use emission factors contained in the most recent AP-42 (Compilation of Air Pollutant Emission Factors) or the most recent FIRE (Factor Information Retrieval) database if vendor or source specific testing data is not available. If emission factors from other sources are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions. The permittee shall document the source of each emission factor used in the calculations.

### **SO<sub>2</sub> Emissions for the Facility**

The following calculation for SO<sub>2</sub> emissions shall utilize the monthly average of the weekly (or daily, if required) H<sub>2</sub>S concentration measurements from gas sample data collected, the monthly gas usage, monthly hours of operation, and the ratio of total sulfur to sulfur as H<sub>2</sub>S from the most recent laboratory test. **Note:** The TRS to H<sub>2</sub>S ratio must be used in the calculation when a Draeger Tube or other sampling method does not measure the total sulfur in the gas.

*SO<sub>2</sub> Emissions (tons per month)*

$$= \frac{(X \text{ scf } H_2S)}{MMcf \text{ LFG}} \times \frac{1.1733 \text{ mols } S}{1 \text{ ft}^3 \text{ H}_2S} \times \frac{34.08 \text{ grams } H_2S}{1 \text{ mol } S} \times \frac{1 \text{ lb}}{453.59 \text{ grams}} \times \frac{1 \text{ ton}}{2,000 \text{ lbs}} \times \frac{1.88 \text{ SO}_2}{H_2S} MW \times LFG \times Ratio \frac{TRS}{H_2S}$$

Where:

X = ppm sulfur content, as H<sub>2</sub>S

S = Sulfur

MW = Molecular Weight of SO<sub>2</sub> to H<sub>2</sub>S

LFG = Actual Landfill Gas Usage per month (ft<sup>3</sup>/month)

Ratio TRS to H<sub>2</sub>S = Determined from most recent laboratory test

### **CO and NO<sub>x</sub> Emissions for Flares**

The following calculation for CO and NO<sub>x</sub> emissions shall utilize the actual HHV of the gas, gas flow rate, and hours of operation.

CO or NO<sub>x</sub> = [(HI) x (EF)] = pph x (H) = pounds/month

HI = (HHV) x (scfm) x (1/1.0E+06) x 60 min/hr

Where:

EF<sub>CO</sub> = 0.37 lb/MMBTU (open flare)

EF<sub>CO</sub> = 0.20 lb/MMBTU (enclosed flare)

EF<sub>NO<sub>x</sub></sub> = 0.068 lb/MMBTU (open flare)

EF<sub>NO<sub>x</sub></sub> = 0.06 lb/MMBTU (enclosed flare)

scfm = standard cubic feet per minute gas flow

H = Actual Hours of Operation per month

HI = Heat Input (MMBTU/hr)

HHV = Average Hourly LFG Higher Heating Value (BTU/ft<sup>3</sup>)