

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

May 31, 2023
REVISED September 29, 2023

PERMIT TO INSTALL
67-23

ISSUED TO
Emerald RNG, LLC and Arbor Hills RNG, LLC

LOCATED AT
10611 West 5 Mile Road
Northville, Michigan 48168

IN THE COUNTY OF
Washtenaw

STATE REGISTRATION NUMBER
N2688

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: March 30, 2023	
DATE PERMIT TO INSTALL APPROVED: May 31, 2023	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 ₂ 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 ₂ S	Hydrogen Sulfide
kW	Kilowatt
lb	Pound
m	Meter
mg	Milligram
mm	Millimeter
MM	Million
MW	Megawatts
NMOC	Non-Methane Organic Compounds
NO _x	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 ₂	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
EURNGPLANT	<p>Renewable natural gas (RNG) plant to refine landfill gas to produce pipeline quality natural gas. It is designed to process up to 10,000 standard cubic feet per minute (scfm) of landfill gas. Before the landfill gas is conditioned to create pipeline quality natural gas, the landfill gas will undergo compression, dewatering, and filtering (to at least 10 microns) to comply with the landfill gas treatment requirements per 40 CFR 62.16714(c)(3) and 40 CFR 63.1959(b)(2)(iii)(C).</p> <p>Prior to entering the RNG plant the landfill gas goes through the Sulfur Treatment System (STS). Landfill gas passes through reactive sulfur absorbing media consisting of 4 media containing vessels operating as 2 separate trains, each consisting of 2 vessels, in a lead-lag configuration.</p> <p>Once the landfill gas is desulfurized, it has two possible pathways. It is either delivered through a dedicated intra-facility pipeline to the AHE Facility for use in the turbines to produce electricity or it enters the RNG Plant. The flares at the landfill are used as backup when the STS and/or the RNG is down.</p> <p>The desulfurized gas entering the RNG treatment system, consists of compression, first Pressure Swing Adsorption (PSA1) to remove siloxanes and VOC, membrane separation to remove CO₂, and second Pressure Swing Adsorption (PSA2) to remove nitrogen (N₂), oxygen (O₂), and remaining moisture.</p>	TBD	NA
EURNGTOX	<p>Thermal oxidizer (TOX) rated at 4,534 scfm capacity of waste gas. The TOX combusts the waste gas stream from EURNGPLANT, which is composed of rejected components from the PSA1, membrane CO₂ removal, and PSA2 stages of the RNG plant.</p>	TBD	NA
EUOFRNG	<p>Open flare rated at 3,720 scfm capacity, to be used as a backup control device during process interruptions, startup and shutdown events, refining process shutdowns, thermal oxidizer outages, or for off-specification product gas.</p>	TBD	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.

**EURNGPLANT
 EMISSION UNIT CONDITIONS**

DESCRIPTION

Renewable natural gas (RNG) plant to refine landfill gas to produce pipeline quality natural gas. It is designed to process up to 10,000 standard cubic feet per minute (scfm) of landfill gas. Before the landfill gas is conditioned to create pipeline quality natural gas, the landfill gas will undergo compression, dewatering, and filtering (to at least 10 microns) to comply with the landfill gas treatment requirements per 40 CFR 62.16714(c)(3)/40 CFR 63.1959(b)(2)(iii)(C).

Prior to entering the RNG plant the landfill gas goes through the Sulfur Treatment System (STS). Landfill gas passes through reactive sulfur absorbing media consisting of 4 media containing vessels operating as 2 separate trains, each consisting of 2 vessels, in a lead-lag configuration.

Once the landfill gas is desulfurized, it has two possible pathways. It is either delivered through a dedicated intra-facility pipeline to the AHE Facility for use in the turbines to produce electricity or it enters the RNG Plant.

The desulfurized gas entering the RNG treatment system, consists of compression, additional hydrogen sulfide (H₂S) removal, particulate filtration, first Pressure Swing Adsorption (PSA1) to remove siloxanes and VOC, membrane separation to remove CO₂, and second Pressure Swing Adsorption (PSA2) to remove nitrogen (N₂), oxygen (O₂), and remaining moisture.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT

Thermal oxidizer (EURNGTOX) - rated at 4,534 scfm of waste gas capacity. It combusts the waste gas stream from EURNGPLANT, which is composed of rejected components from the PSA1, membrane CO₂ removal, and PSA2 stages of the RNG plant.

Open (non-enclosed) flare (EUOFRNG) – rated at 3,720 scfm capacity. It is used as a backup control device during process interruptions, startup and shutdown events, refining process shutdowns, thermal oxidizer outages, or for off-specification product gas.

I. EMISSION LIMIT(S)

NA

II. MATERIAL LIMIT(S)

Material	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. Total Sulfur concentration	20 ppmv	Instantaneous	Outlet of the STS	SC V.1, SC VI.2	R 336.1205(1)(a) & (b), R 336.1224, R 336.1225

III. PROCESS/OPERATIONAL RESTRICTION(S)

- No later than 30 days after the completion of installation of the equipment, the permittee shall submit to the AQD District Supervisor, for review and approval, a preventative maintenance/malfunction abatement plan (PM/MAP) for EURNGPLANT. After approval of the PM/MAP by the AQD District Supervisor, the permittee shall not operate EURNGPLANT 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, 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.
 - i. Method for evaluation breakthrough of adsorption media.
 - ii. Process to replace media.
 - iii. Description of media redundancy during changeouts.
 - iv. How to determine when the bypass following the sulfur-removal system will be used.
 - v. How the flow of gas will be switched between the bypass or the full condition system.
- 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 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, R 336.2803, R 336.2804)**

2. The permittee shall route all waste exhaust gases from EURNGPLANT to EURNGTOX. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, R 336.2803, R 336.2804)**

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The capacity of EURNGPLANT shall not exceed more than 10,000 scfm of landfill gas. **(R 336.1205(1)(a) & (b))**
2. The permittee shall operate and maintain a pipeline to route RNG-treated landfill gas from the proposed RNG Facility to the AHE Facility and the landfill flares as required to meet Subparagraph 22(g) of Consent Decree Civil No. 5:21-CV-12098-SDD-EAS.
(Consent Decree Civil No. 5:21-CV-12098-SDD-EAS Subparagraph 22(f))

V. TESTING/SAMPLING

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

1. Within 15 days of the initial use of desulfurized landfill gas in EURNGPLANT, the permittee shall verify the H₂S or TRS concentration in the landfill gas weekly by gas sampling (e.g. Draeger Tubes or equivalent, approved method) for 4 consecutive weeks and monthly by gas sampling using an EPA approved method and laboratory analysis. Data obtained from the initial 4 consecutive weeks of gas sampling will be evaluated to determine variability and concentration of the H₂S in the landfill gas.

Thereafter, the permittee shall verify the hydrogen sulfide (H₂S) or total reduced sulfur (TRS) content of the landfill gas burned in EURNGPLANT (weekly when the turbines are operating) monthly by gas sampling (e.g. Draeger Tubes, Tedlar Sampling Bags, 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 H₂S (TRS equivalent) concentration of the landfill gas sample exceeds 20 ppmv, the permittee shall sample and record the H₂S (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 H₂S (TRS equivalent) concentration of the landfill gas is maintained below 20 ppmv for one month 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)**

VI. MONITORING/RECORDKEEPING

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

1. The permittee shall keep, in a satisfactory manner, all records related to, or as required by, the PM / MAP for EURNGPLANT including but not limited to the following:
 - a) Records identifying the equipment and, if applicable, air-cleaning device and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair.
 - b) Records describing the items or conditions of inspection and frequency of the inspections or repairs.
 - c) Records identifying 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.
 - i. Method for evaluation breakthrough of adsorption media.
 - ii. Records describing the process to replace media.
 - iii. Records describing media redundancy during changeouts.
 - iv. Records of how to determine when the bypass following the sulfur-removal system will be used.
 - v. Records describing how the flow of gas will be switched between the bypass or the full condition system.
 - d) Records identifying the major replacement parts that shall be maintained in inventory for quick replacement.
 - e) Records describing 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.

The permittee shall keep all records on file in a format acceptable to the District Supervisor 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 336.1912, R 336.2803, R 336.2804)**

2. The permittee shall keep, in a satisfactory manner, records of the monthly hours of operation of EURNGPLANT. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1205(1)(a) & (3), R 336.1224, R 336.1225, R 336.2803, R 336.2804)**
3. The permittee shall keep, in a satisfactory manner, records of the average daily vacuum (in H₂O) applied on the landfill gas coming from EURNGPLANT. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1205(1)(a) & (3), R 336.1224, R 336.1225, R 336.2803, R 336.2804)**
4. The permittee shall monitor and record the following average daily landfill gas parameters separately for landfill gas processed through the STS and EURNGPLANT:
 - a. Heat content of gas (BTU/scf),
 - b. Total heat content of gas per day (MMBTU/day),
 - c. Total flow of gas (scf/day).

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)**

VII. REPORTING

1. Within 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by this Permit to Install, the permittee or the authorized agent pursuant to Rule 204, shall notify the AQD District Supervisor, in writing, of the completion of the activity. Completion of the installation, construction, reconstruction, relocation, or modification is considered to occur not later than commencement of trial operation of EURNGPLANT. **(R 336.1201(7)(a))**
2. Within 30 days after commencement of initial startup of EURNGPLANT, the permittee or the authorized agent shall notify the AQD District Supervisor, in writing. **(R 336.1201)**
3. Within 15 days after the end of a calendar month, the permittee shall submit to the AQD District Supervisor the average daily vacuum (in H₂O) applied on the landfill gas from EURNGPLANT. Additionally, the average daily heat content of landfill gas, total heat content of gas per day, and the total flow of landfill gas processed through EURNGPLANT and the STS for the previous month shall also be reported for FGPROJECT23, EURNGPLANT and/or Landfill Flares. **(R 336.1201)**

VIII. STACK/VENT RESTRICTION(S)

NA

IX. OTHER REQUIREMENT(S)

NA

**EURNGTOX
 EMISSION UNIT CONDITIONS**

DESCRIPTION

Thermal oxidizer rated for 4,534 scfm waste gas capacity. The thermal oxidizer combusts the waste gas stream from EURNGPLANT, which is composed of rejected components from the PSA1, membrane CO₂ removal, and PSA2 stages of the RNG plant.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT

NA

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. NO _x	0.06 lb/MMBTU	Hourly	EURNGTOX	SC V.1, SC VI.1, SC VI.5	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
2. NO _x	11.1 tpy	12-month rolling time period as determined at the end of each calendar month	EURNGTOX	SC VI.4	R 336.1205(1)(a) & (b)
3. CO	0.20 lb/MMBTU	Hourly	EURNGTOX	SC V.1, SC VI.1, SC VI.5	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
4. CO	37.0 tpy	12-month rolling time period as determined at the end of each calendar month	EURNGTOX	SC VI.4	R 336.1205(1)(a) & (b)

II. MATERIAL LIMIT(S)

NA

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall only burn natural gas or waste gases from EURNGPLANT in EURNGTOX. **(R336.1205, R336.1224, R336.1225, R 336.2803, R 336.2804)**
2. The permittee shall continuously operate EURNGTOX at a minimum destruction temperature of 1,450 degrees Fahrenheit. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, R 336.2803, R 336.2804)**
3. No later than 30 days after the completion of installation of the equipment, the permittee shall submit to the AQD District Supervisor, for review and approval, a preventative maintenance/malfunction abatement plan

(PM/MAP) for EURNGTOX. After approval of the PM/MAP by the AQD District Supervisor, the permittee shall not operate EURNGTOX 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, 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 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 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, R 336.2803, R 336.2804)**

IV. DESIGN/EQUIPMENT PARAMETER(S)

- 1. The permittee shall install, calibrate, maintain, and operate in a satisfactory manner, a device to monitor and record the volumetric flow rate of gas burned in EURNGTOX, on a continuous basis. Continuous shall be defined in this permit at least one reading every 15 minutes. **(R 336.1205, R 336.1224, R 336.1225, R 336.2803, R 336.2804)**
- 2. The permittee shall install, calibrate, maintain, and operate in a satisfactory manner, a device to monitor and record the temperature in EURNGTOX, on a continuous basis. Continuous shall be defined in this permit at least one reading every 15 minutes. **(R 336.1205, R 336.1224, R 336.1225, R 336.2803, R 336.2804)**
- 3. The nameplate heat input capacity of EURNGTOX shall not exceed 20.6 MMBTU/hr (based on supplemental natural gas) and 42.2 MMBTU/hr (based on a combination of waste gas and natural gas). **(R 336.1205, R 336.1224, R 336.1225, 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. Within 180 days after commencement of initial start-up, the permittee shall verify NOx and CO emission rates and operating parameter boundaries for EURNGTOX by testing at the owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in the table below.

Pollutant	Test Method Reference
NO _x	40 CFR Part 60, Appendix A
CO	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. The permittee must submit 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 336.2001, 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 keep, in a satisfactory manner, continuous records of the volumetric flow rate of gas burned in EURNGTOX. 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 336.2803, R 336.2804)**
3. The permittee shall keep, in a satisfactory manner, continuous records of the combustion chamber temperature of EURNGTOX. 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 336.2803, R 336.2804)**
4. The permittee shall calculate and keep, in a satisfactory manner, records of monthly and 12-month rolling total NOx and CO mass emissions for EURNGTOX. Calculations shall be performed according to Appendix 7 using the most recent stack test and/or gas sampling data. 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)**
5. The permittee shall keep, in a satisfactory manner, all records related to, or as required by, the PM/MAP. 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 336.1912, R 336.2803, R 336.2804)**

VII. REPORTING

1. Within 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by this Permit to Install, the permittee or the authorized agent pursuant to Rule 204, shall notify the AQD District Supervisor, in writing, of the completion of the activity. Completion of the installation, construction, reconstruction, relocation, or modification is considered to occur not later than commencement of trial operation of EURNGTOX. **(R 336.1201(7)(a))**

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. SVRNGTOX	84	50	R 336.1225, R 336.2803, R 336.2804

IX. OTHER REQUIREMENT(S)

NA

**EUOFRNG
 EMISSION UNIT CONDITIONS**

DESCRIPTION

Open flare rated for 3,720 scfm capacity, to be used as a backup control device during process interruptions, startup and shutdown events, refining process shutdowns, thermal oxidizer outages, or for off-specification product gas.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT

Sulfur Treatment System and RNG processing equipment.

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. NO _x	0.068 lb/MMBTU	Hourly	EUOFRNG	SC V.1, SC VI.3, SC VI.6	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
2. NO _x	5.53 tpy	12-month rolling time period as determined at the end of each calendar month	EUOFRNG	SC VI.5, SC VI.7	R 336.1205(1)(a) & (b)
3. CO	0.31 lb/MMBTU	Hourly	EUOFRNG	SC V.1, SC VI.3, SC VI.6	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
4. CO	25.2 tpy	12-month rolling time period as determined at the end of each calendar month	EUOFRNG	SC VI.5, SC VI.7	R 336.1205(1)(a) & (b)

II. MATERIAL LIMIT(S)

1. The volumetric feed rate for EUOFRNG shall not exceed a maximum of 3,720 standard cubic feet per minute at 95.2% methane. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall not operate EUOFRNG for more than 750 hours per year, based on a 12-month rolling time period as determined at the end of each calendar month. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**
2. The permittee shall not burn in EUOFRNG any gas that has not at a minimum been processed through the Treatment System of EURNGPLANT, including initial filtration, dewatering, and H₂S removal. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**

3. The permittee must operate EUOFRNG at all times when the collected gas is routed to it. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**
4. The flare must be operated with a flame present at all times. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**
5. The permittee shall only burn natural gas or off-spec RNG in EUOFRNG. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**
6. No later than 30 days after the completion of installation of the equipment, the permittee shall submit to the AQD District Supervisor, for review and approval, a preventative maintenance/malfunction abatement plan (PM/MAP) for EUOFRNG. After approval of the PM/MAP by the AQD District Supervisor, the permittee shall not operate EUOFRNG 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, 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 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 336.1205, R 336.1224, R 336.1225, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, R 336.2803, R 336.2804)**

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The permittee shall install, calibrate, maintain, and operate in a satisfactory manner, a device to monitor and record the volumetric flow rate of gas burned in EUOFRNG, on a continuous basis. Continuous shall be defined in this permit at least one reading every 15 minutes. **(R 336.1205, R 336.1224, R 336.1225, R 336.2803, R 336.2804)**
2. The permittee must install, calibrate, maintain, and operate according to the manufacturer's specifications, a heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**
3. The nameplate heat input capacity of EUOFRNG shall not exceed 216.8 MMBTU/hr. **(R 336.1205, R 336.1224, R 336.1225, 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. If EUOFRNG is not installed, configured, operated, and maintained according to the manufacturer's emission-related written instructions, or the permittee changes emission-related settings in a way that is not permitted by the manufacturer, the AQD District Supervisor may request the permittee to verify NO_x and CO

emission rates for EUOFRNG by testing at the owner's expense, in accordance with Department requirements. Testing shall be performed using an approved EPA Method listed in the table below.

Pollutant	Test Method Reference
NO _x	40 CFR Part 60, Appendix A
CO	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. The permittee must submit 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 336.2001, 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 keep, in a satisfactory manner, continuous records of the volumetric flow rate of gas burned in EUOFRNG. 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 336.2803, R 336.2804)**
2. The permittee shall keep in a satisfactory manner, records of the total hours of operation for EUOFRNG on a monthly and 12-month rolling time period. 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, R 336.2803, R 336.2804)**
3. The permittee shall keep, in a satisfactory manner, manufacturer specifications for EUOFRNG. 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, R 336.1910, R 336.1911, R 336.1912, R 336.2803, R 336.2804)**
4. The permittee shall calculate and keep, in a satisfactory manner, records of monthly and 12-month rolling total NO_x and CO mass emissions for EUOFRNG. Calculations shall be performed according to Appendix 7 using manufacturer data or the most recent stack test. 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)**
5. The permittee shall keep, in a satisfactory manner, all records related to, or as required by, the PM/MAP. 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, R 336.1910, R 336.1911, R 336.1912, R 336.2803, R 336.2804)**
6. When the EUOFRNG is operated, the permittee shall monitor and record the following average daily RNG parameters, for the gas sent to EUOFRNG:
 - a) Heat content of gas (BTU/scf),
 - b) Total heat content of gas per day (MMBTU/day),
 - c) Percent methane,
 - d) Total flow of gas (scf/day)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)**

VII. REPORTING

1. Within 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by this Permit to Install, the permittee or the authorized agent pursuant to Rule 204, shall notify the AQD District Supervisor, in writing, of the completion of the activity. Completion of the installation, construction, reconstruction, relocation, or modification is considered to occur not later than commencement of trial operation of EUOFRNG. **(R 336.1201(7)(a))**

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. SVOFRNG	NA	40	R 336.1225, R 336.2803, R 336.2804

IX. OTHER REQUIREMENT(S)

NA

Footnotes:

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

Appendix 7. Emission Calculations

The permittee shall use the following calculations in conjunction with monitoring, testing or recordkeeping data to determine compliance with the applicable requirements referenced in this PTI.

Net Heating Value of the gas being combusted in the flare:

The permittee has the choice of adhering to the heat content specifications in 40 CFR 63.11(b)(6)(ii) (equations below), and the maximum tip velocity specifications in 40 CFR 63.11(b)(7) or (b)(8), or adhering to the requirements in 40 CFR 63.11(b)(6)(i). **(40 CFR 63.11(b)(6))**

$$H_T = K \sum_{i=1}^n C_i H_i$$

Where:

H_T = Net heating value of the sample, MJ/scm; where the net enthalpy per mole of off gas is based on combustion at 25°C and 760 mmHg, but the standard temperature for determining the volume corresponding to one mole is 20°C;

$$K = Constant = (1.740 \times 10^{-7}) \left(\frac{1}{ppm} \right) \left(\frac{g \text{ mole}}{scm} \right) \left(\frac{MJ}{kcal} \right)$$

Where the standard temperature for $\left(\frac{g \text{ mole}}{scm} \right)$ is 20°C;

C_i = Concentration of sample component i in ppm on a wet basis, as measured for organics by Reference Method 18 and measured for hydrogen and carbon monoxide by ASTM D1946–77 or 90 (Reapproved 1994) (Incorporated by reference as specified in 40 CFR 63.14); and

H_i = Net heat of combustion of sample component i , kcal/g mole at 25°C and 760 mmHg. The heats of combustion may be determined using ASTM D2382–76 or 88 or D4809–95 (incorporated by reference as specified in 40 CFR 63.14) if published values are not available or cannot be calculated.

n = Number of sample components.

Calculation for Vmax steam-assisted and non-assisted flares

The maximum permitted velocity, V_{max} , for flares complying with 40 CFR 63.11(b)(7)(i) must be calculated and recorded using the equation provided in 40 CFR 63.11(b)(7)(iii). **(40 CFR 63.11(b)(7)(iii))**

$$\text{Log}_{10}(V_{max}) = (H_T + 28.8)/31.7$$

Where:

V_{max} = Maximum permitted velocity, M/sec

28.8 = Constant

31.7 = Constant

H_T = The net heating value as determined in 63.11(b)(6).

Calculation for Vmax for air-assisted flares

The maximum permitted velocity, V_{max} , for air-assisted flares must be calculated and recorded using the equation provided in 40 CFR 63.11(b)(8). **(40 CFR 63.11(b)(8))**

$$V_{max} = 8.71 + 0.708 (H_T)$$

Where:

V_{max} = Maximum permitted velocity, m/sec
8.71 = Constant
0.708 = Constant
 H_T = The net heating value as determined in 63.11(b)(6)(ii).

Calculation for mass emissions

$$tpy = (X) (HI) \left(\frac{hr}{yr} \right) \left(\frac{1 \text{ ton}}{2000 \text{ lbs}} \right)$$

X = Manufacturer Specification or most recent test result (lb/MMBTU)
HI = Heat input capacity of burner (MMBTU/hr)

Calculation for 40 CFR Part 60, Subpart GG

40 CFR 60.6332(a)(2)

$$STD = (0.0150) \left(\frac{14.4}{Y} \right) + F$$

STD = allowable ISO corrected (if required as given in 40 CFR 60.335(b)(1)) NOx emission concentration (percent by volume at 15 percent oxygen and on a dry basis)
Y = manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour, and
F = NOx emission allowance for fuel-bound nitrogen as defined in 40 CFR 60.332(a)(4).