Arbor Hills Energy LLC
Emerald RNG LLC
One North Lexington Avenue, Suite 1450
White Plains, New York 10601
Tel. (914) 705-4000 Fax. (914) 705-4019

May 14, 2024

Diane Kavanaugh Vetort
Michigan Department of Environment, Great Lakes & Energy
Air Quality Division - Jackson District Office
301 E. Louis Glick Hwy
Jackson, MI 49201

Subject: Renewal Applications for ROP N2688-2011a, to Incorporate PTI Nos: 67-23A & 68-23A
Arbor Hills Landfill, SRN: N2688

Ms. Kavanaugh Vetort,

OPAL Fuels ("Company") is submitting the documentation required to update PTI Application Nos. APP-2022-0214 and APP-2022-0215 for Emerald RNG LLC ("Emerald") and Arbor Hills Energy LLC ("AHE"), respectively. As indicated on attached M-001 forms, the Company is requesting that PTI No: 67-23A for Emerald be incorporated into the existing ROP N2688-2011a as a new section, and AHE's section 3 of ROP N2688-2011a be entirely updated with PTI No. 68-23A due to significant changes in permit conditions.

Please direct all questions regarding this submittal to Suparna Chakladar at (951) 833-4153.

Sincerely,

Anthony J. Falbo
Chief Operating Officer
OPAL Fuels
Arbor Hills Energy LLC
Emerald RNG LLC

cc: Suparna Chakladar, OPAL Fuels

App No. 202400066

EGLE Michigan Department of Environment, Great Lakes, and Energy - Air Quality Division

RENEWABLE OPERATING PERMIT APPLICATION
C-001: CERTIFICATION

This information is required by Article II, Chapter 1, part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to provide this information may result in civil and/or criminal penalties. Please type or print clearly.

This form is completed and included as part of Renewable Operating Permit (ROP) initial and renewal applications, notifications of change, amendments, modifications, and additional information.

Form Type **C-001**	SRN N2688

Stationary Source Name Arbor Hills Landfill	
City Northville	County Washtenaw

SUBMITTAL CERTIFICATION INFORMATION

1. Type of Submittal *Check only one box.*

☐ Initial Application (Rule 210) ☒ Notification / Administrative Amendment / Modification (Rules 215/216)

☐ Renewal (Rule 210) ☐ Other, describe on AI-001

2. If this ROP has more than one Section, list the Section(s) that this Certification applies to 3,4

3. Submittal Media ☒ E-mail ☐ FTP ☐ Disk ☐ Paper

4. Operator's Additional Information ID - Create an Additional Information (AI) ID that is used to provide supplemental information on AI-001 regarding a submittal.

AI

CONTACT INFORMATION

Contact Name Suparna Chakladar	Title Senior Vice President - Fuel Supply & Env. Services
Phone number 951-833-4153	E-mail address schakladar@opalfuels.com

This form must be signed and dated by a Responsible Official.

Responsible Official Name Anthony J. Falbo			Title Chief Operating Officer	
Mailing address 5087 Junction Road				
City Lockport	State NY	ZIP Code 14094	County Niagara	Country US

As a Responsible Official, I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this submittal are true, accurate and complete.

Signature of Responsible Official

5/14/24
Date

App No. 202400066

EGLE

Michigan Department of Environment, Great Lakes, and Energy
Air Quality Division

RENEWABLE OPERATING PERMIT
M-001: RULE 215 CHANGE NOTIFICATION
RULE 216 AMENDMENT/MODIFICATION APPLICATION

This information is required by Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment.

1. SRN N2688	2. ROP Number 2688-2011a	3. County Washtenaw
4. Stationary Source Name	Arbor Hills Landfill	
5. Location Address	10611 W Five Mile Road	6. City Northville

7. Submittal Type - *The submittal must meet the criteria for the box checked below. Check only one box. Attach a mark-up of the affected ROP pages for applications for Rule 216 changes.*

- ☐ **Rule 215(1) Notification of change**. *Complete Items 8 – 10 and 14*
- ☐ **Rule 215(2) Notification of change**. *Complete Items 8 – 10 and 14*
- ☐ **Rule 215(3) Notification of change**. *Complete Items 8 – 11 and 14*
- ☐ **Rule 215(5) Notification of change**. *Complete Items 8 – 10 and 14*
- ☐ **Rule 216(1)(a)(i)-(iv) Administrative Amendment**. *Complete Items 8 – 10 and 14*
- ☐ **Rule 216(1)(a)(v) Administrative Amendment**. *Complete Items 8 – 14. Results of testing, monitoring & recordkeeping must be submitted. See detailed instructions.*
- ☒ **Rule 216(2) Minor Modification**. *Complete Items 8 – 12 and 14*
- ☐ **Rule 216(3) Significant Modification**. *Complete Items 8 – 12 and 14, and provide any additional information needed on ROP application forms. See detailed instructions.*
- ☐ **Rule 216(4) State-Only Modification**. *Complete Items 8 – 12 and 14*

8. Effective date of the change. (MM/DD/YYYY) *See detailed instructions.* 5/10/2024	9. Change in emissions? ☒ Yes ☐ No

10. Description of Change - *Describe any changes or additions to the ROP, including any changes in emissions and/or pollutants that will occur. If additional space is needed, complete an Additional Information form (AI-001).*

The Company is requesting that PTI No: 67-23A for Emerald RNG LLC be incorporated into existing ROP N2688-2011a, as a new section, and AHE's section 3 of ROP N2688-2011a be entirely updated with PTI No. 68-23A due to significant changes in permit conditions.

11. New Source Review Permit(s) to Install (PTI) associated with this application? ☒ Yes ☐ No

If Yes, enter the PTI Number(s) 67-23A 68-23A ____-____ ____-____ ____-____

12. Compliance Status - *A narrative compliance plan, including a schedule for compliance, must be submitted using an AI-001 if any of the following are checked No.*

a. Is the change identified above in compliance with the associated applicable requirement(s)? ☒ Yes ☐ No

b. Will the change identified above continue to be in compliance with the associated applicable requirement(s)? ☒ Yes ☐ No

c. If the change includes a future applicable requirement(s), will timely compliance be achieved? ☒ Yes ☐ No

13. Operator's Additional Information ID - *Create an Additional Information (AI) ID for the associated AI-001 form used to provide supplemental information.* **AI**

14. Contact Name	Telephone No.	E-mail Address
Suparna Chakladar	951-833-4153	schakladar@opalfuels.com

15. This submittal also updates the ROP renewal application submitted on 09/06/2022 ☒ Yes ☐ N/A
(If yes, a mark-up of the affected pages of the ROP must be attached.)

NOTE: A CERTIFICATION FORM (C-001) SIGNED BY A RESPONSIBLE OFFICIAL MUST ACCOMPANY ALL SUBMITTALS

EGLE

Michigan Department of Environment, Great Lakes, and Energy
Air Quality Division

App No. 202400066

RENEWABLE OPERATING PERMIT
M-001: RULE 215 CHANGE NOTIFICATION
RULE 216 AMENDMENT/MODIFICATION APPLICATION

This information is required by Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment.

1. SRN N2688	2. ROP Number 2688-2011a	3. County Washtenaw
4. Stationary Source Name	Arbor Hills Landfill	
5. Location Address	10611 W Five Mile Road	6. City Northville

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- ☐ **Rule 215(5) Notification of change**. *Complete Items 8 – 10 and 14*
- ☐ **Rule 216(1)(a)(i)-(iv) Administrative Amendment**. *Complete Items 8 – 10 and 14*
- ☐ **Rule 216(1)(a)(v) Administrative Amendment**. *Complete Items 8 – 14. Results of testing, monitoring & recordkeeping must be submitted. See detailed instructions.*
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- ☐ **Rule 216(3) Significant Modification**. *Complete Items 8 – 12 and 14, and provide any additional information needed on ROP application forms. See detailed instructions.*
- ☐ **Rule 216(4) State-Only Modification**. *Complete Items 8 – 12 and 14*

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9. Change in emissions? ☒ Yes ☐ No

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The Company is requesting that PTI No: 67-23A for Emerald RNG LLC be incorporated into existing ROP N2688-2011a, as a new section, and AHE's section 3 of ROP N2688-2011a be entirely updated with PTI No. 68-23A due to significant changes in permit conditions.

11. New Source Review Permit(s) to Install (PTI) associated with this application? ☒ Yes ☐ No

If Yes, enter the PTI Number(s) 68-23A 67-23A ____-____ ____-____ ____-____

12. Compliance Status - *A narrative compliance plan, including a schedule for compliance, must be submitted using an AI-001 if any of the following are checked No.*

a. Is the change identified above in compliance with the associated applicable requirement(s)? ☒ Yes ☐ No

b. Will the change identified above continue to be in compliance with the associated applicable requirement(s)? ☒ Yes ☐ No

c. If the change includes a future applicable requirement(s), will timely compliance be achieved? ☒ Yes ☐ No

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14. Contact Name	Telephone No.	E-mail Address
Suparna Chakladar	951-833-4153	schakladar@opalfuels.com

15. This submittal also updates the ROP renewal application submitted on 09/06/2022 ☒ Yes ☐ N/A
(If yes, a mark-up of the affected pages of the ROP must be attached.)

NOTE: A CERTIFICATION FORM (C-001) SIGNED BY A RESPONSIBLE OFFICIAL MUST ACCOMPANY ALL SUBMITTALS

PERMIT TO INSTALL

Table of Contents

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_2e	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_2S	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 conditions 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	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). 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 flares at the landfill are used as backup when the STS and/or the RNG is down. 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 CO_2, and second Pressure Swing Adsorption (PSA2) to remove nitrogen (N_2), oxygen (O_2), and remaining moisture.	9/11/2023	NA
EURNGTOX	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 CO_2 removal, and PSA2 stages of the RNG plant.	9/11/2023	NA
EUOFRNG	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.	9/11/2023	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 (H_2S) removal, particulate filtration, first Pressure Swing Adsorption (PSA1) to remove siloxanes and VOC, membrane separation to remove CO_2, and second Pressure Swing Adsorption (PSA2) to remove nitrogen (N_2), oxygen (O_2), 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 CO_2 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. 1.	R 336.1205(1)(a) & (b), R 336.1224, R 336.1225

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. 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. The permittee shall verify the H_2S 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 USEPA 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 H_2S in the landfill gas.

   Thereafter, the permittee shall verify the hydrogen sulfide (H_2S) 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 H_2S (TRS equivalent) concentration of the landfill gas sample exceeds 20 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 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 H_2O) 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 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 15 days following the end of a calendar month, the permittee shall submit to the AQD District Supervisor the average daily vacuum (in H_2O) 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 CO_2 removal, and PSA2 stages of the RNG plant.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT

NA

III. 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,	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
2. NOx	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,	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. 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

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:

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. Natural gas may be burned as needed to assist in combustion.

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,	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
2. NOx	5.53 tpy	12-month rolling time period as determined at the end of each calendar month	EUOFRNG	SC. VI.2, SC VI.4	R 336.1205(1)(a) & (b)
3. CO	0.31 lb/MMBTU	Hourly	EUOFRNG	SC V.1	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.2, SC VI.4	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)**

2. The permittee shall not burn over 162,569 MMBtu of total combined natural gas and landfill gas in EUOFRNG, 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)**

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. 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 H_2S removal. **(R 336.1205, R 336.1224, R 336.1225, R 336.1702, R 336.2803, R 336.2804)**

2. 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)**

3. 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)**

4. 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)**

5. 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 NOx 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 combined quantity of natural gas and landfill gas burned in 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 NOx 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

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:

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;

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

Where the standard temperature for $\left(\frac{g\ mole}{scm}\right)$ 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))**

$Log_{10}(V_{max}) = (H_T + 28.8)/31.7$

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))**

$Vmax = 8.71 + 0.708\ (H_T)$

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

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

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)

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

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).

PERMIT TO INSTALL

Table of Contents

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_2e	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_2S	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 conditions 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
EUTURBINE/DB1	A stationary EGT-Typhoon combined cycle turbine rated at 58.7 MMBTU/hr with a heat recovery steam generator (HRSG) and an associated duct burner rated at 10.2 MMBTU/hr. The turbine and duct burner are fueled with desulfurized landfill gas that has undergone 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). The turbine uses diesel as a supplemental fuel..	2015	FGTURBINES, FGPROJECT23
EUTURBINE/DB2	A stationary EGT-Typhoon combined cycle turbine rated at 58.7 MMBTU/hr with a HRSG and an associated duct burner rated at 10.2 MMBTU/hr. The turbine and duct burner are fueled with desulfurized landfill gas that has undergone 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). The turbine uses diesel as a supplemental fuel..	2015	FGTURBINES, FGPROJECT23
EUTURBINE/DB3	A stationary EGT-Typhoon combined cycle turbine rated at 58.7 MMBTU/hr with a HRSG and an associated duct burner rated at 10.2 MMBTU/hr. The turbine and duct burner are fueled with desulfurized landfill gas that has undergone 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). The turbine uses diesel as a supplemental fuel..	2015	FGTURBINES FGPROJECT23
EUTURBINE4	A stationary Solar brand simple cycle turbine rated at 61.4 MMBTU/hr. The turbine is fueled with desulfurized landfill gas that has undergone 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). The turbine also uses propane fuel for startup only.	2015	FGPROJECT23

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.

EUTURBINE4
EMISSION UNIT CONDITIONS

DESCRIPTION

A stationary Solar brand simple cycle turbine rated at 61.4 MMBTU/hr. The turbine is fueled with desulfurized landfill gas that has undergone 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). The turbine also uses propane fuel for startup only.

Flexible Group ID: FGPROJECT23

POLLUTION CONTROL EQUIPMENT

Sulfur Treatment System

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. NO_x	8.49 pph	Hourly	EUTURBINE4	SC V.3, SC VI.4	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
2. NO_x	11.4 tpy	12-month rolling time period as determined at the end of each calendar month.	EUTURBINE4	SC. VI.1, SC VI.2, SC VI.4	R 336.1205(1)(a) & (b)
3. NO_x	74 ppm at 15% O_2 or 460 ng/J of useful output (3.6 lb/MWh)	Hourly	EUTURBINE 4	SC V.1, SC VI.4	40 CFR Part 60.4320(a) & (b), Table 1 Subpart KKKK
4. CO	13.2 pph	Hourly	EUTURBINE4	SC V.3, SC VI.4	R 336.1205(1)(a) & (b), R 336.2804
5. CO	17.7 tpy	12-month rolling time period as determined at the end of each calendar month.	EUTURBINE4	SC. VI.1, SC VI.2, SC VI.4	R 336.1205(1)(a) & (b)
6. SO_2	65 ng/J or 0.15 lbs/MMBTU heat input	Hourly	EUTURBINE4	SC V.2, SC VI.4	40 CFR Part 60.4330 (a)(3), Subpart KKKK
7. SO_2	0.41 pph	Hourly	EUTURBINE4	SC. V.2, SC VI.4	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
8. VOC	0.80 pph	Hourly	EUTURBINE4	SC. V.3, SC VI.4	R 336.1205(1)(a) & (b), R 336.1702(c)
9. Hydrogen Chloride	0.60 pph	Hourly	EUTURBINE4	SC V.4, SC VI.4	R 336.1225

II. MATERIAL LIMIT(S)

Material	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. Propane (start up fuel only)	5,226 gallons/yr	12-month rolling time period as determined at the end of each calendar month	EUTURBINE4	SC VI.1, SC VI.4	R 336.1205(1)(a) & (b)

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall only burn desulfurized landfill gas and propane as fuel in EUTURBINE4. **(R336.1205, R336.1224, R336.1225, R 336.2803, R 336.2804)**

2. The permittee shall only operate EUTURBINE4 when EURNGTOX or EUOFRNG are not operating. **(R336.1205, R336.1224, R336.1225, R 336.2803, R 336.2804)**

3. The permittee shall not exceed 10 minutes per hour for EUTURBINE4 when starting the turbine on propane fuel. **(R336.1205, R336.1224, R336.1225, R 336.2803, R 336.2804)**

4. The permittee shall not operate EUTURBINE4 unless a malfunction abatement plan (MAP) as described in Rule 911(2), has been submitted within 180 days of initial start-up, and is implemented and maintained. The MAP shall, at a minimum, specify the following:
   a) A complete preventative maintenance program including identification of the supervisory personnel responsible for overseeing the inspection, maintenance, and repair of air-cleaning devices, a description of the items or conditions that shall be inspected, the frequency of the inspections or repairs, and an identification of the major replacement parts that shall be maintained in inventory for quick replacement.
   b) An identification of the source and fuel-cleaning equipment operating variables that shall be monitored to detect a malfunction or failure, the normal operating range of these variables, and a description of the method of monitoring or surveillance procedures.
   c) 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 MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the permittee shall amend the MAP within 45 days after such an event occurs. The permittee shall also amend the MAP within 45 days, if new equipment is installed or upon request from the District Supervisor. The permittee shall submit the MAP and any amendments to the MAP to the AQD District Supervisor for review and approval. If the AQD does not notify the permittee within 90 days of submittal, the MAP or amended 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)**

5. The permittee must operate and maintain EUTURBINE4, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction. **(40 CFR 60.4333(a))**

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The heat input capacity of EUTURBINE4 shall not exceed a maximum of 61.4 MMBTU per hour. **(R336.1205, R 336.2803, R 336.2804)**

2. The permittee shall not operate EUTURBINE4 unless a device to continuously monitor and record the total landfill gas flow rate to EUTURBINE4 is installed, maintained, and operated in a satisfactory manner acceptable to the AQD District Supervisor. **(R336.1205, R 336.2803, R 336.2804)**

3. The permittee shall monitor the methane content of the landfill gas sent to EUTURBINE4 at least once each calendar week, using a calibrated hand-held methane meter. The device shall be maintained and operated in a satisfactory manner acceptable to the AQD District Supervisor. **(R336.1205, R 336.2803, R 336.2804)**

4. The permittee shall not operate EUTURBINE4 unless a system to remove sulfur in the landfill gas sent to EUTURBINE4 has been installed, calibrated, maintained, and operated in a satisfactory manner acceptable to the AQD District Supervisor. **(R336.1205, R336.1224, R336.1225, 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. The permittee must perform annual performance tests in accordance with 40 CFR Part 60 Subpart KKKK to demonstrate continuous compliance with the NOx emission limit, SC I.3, for EUTURBINE4. If the NOx emission result from the performance test is less than or equal to 75 percent of the NOx emission limit for EUTURBINE4, you may reduce the frequency of subsequent performance tests to once every 2 years (no more than 26 calendar months following the previous performance test). If the results of any subsequent performance test exceed 75 percent of the NOx emission limit for EUTURBINE4, you must resume annual performance tests. 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 336.2001, R 336.2002, R 336.2003, R 336.2004, 40 CFR 60.4340, 40 CFR 60.4400)**

2. The permittee must conduct performance tests to verify SO_2 emissions rates from EUTURBINE4 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:

Pollutant	Test Method Reference
SO_2	40 CFR Part 60, Appendix A

SO2 performance tests shall be conducted on an annual basis (no more than 14 calendar months following the previous performance test). The methodologies that may be used are listed in 40 CFR 60.4415. An alternate method, or a modification to the approved EPA Method, may be specified in an AQD approved Test Protocol and must meet the requirements of the federal Clean Air Act, all applicable state and federal rules and regulations, and be within the authority of the AQD to make the change. 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, 40 CFR 60.4415)**

3. Once every five years the permittee shall verify NOx, CO, and VOC emission rates from EUTURBINE4 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:

Pollutant	Test Method Reference
NO_x	40 CFR Part 60, Appendix A
CO	40 CFR Part 60, Appendix A
VOC	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 and must meet the requirements of the federal Clean Air Act, all applicable state and federal rules and regulations, and be within the authority of the AQD to make the change. 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 336.1225, R 336.2001, R 336.2003, R 336.2004, R 336.2803, R 336.2804)**

4. Once every five years the permittee shall verify hydrogen chloride emission rates from EUTURBINE4, 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:

Pollutant	Test Method Reference
Hydrogen Chloride	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 336.1225, 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, a record of the total of each fuel combusted in EUTURBINE4 on a monthly and 12-month rolling time period basis. 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)**

2. The permittee shall keep, in a satisfactory manner, a record of the total monthly and 12-month rolling NO_x, CO, and VOC emission rates from EUTURBINE4. 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)**

3. The permittee shall monitor and record the following average daily landfill gas parameters:
   a) Heat input of the landfill gas (BTU/scf),
   b) Heat input of the landfill gas burned (MMBTU/day),
   c) Landfill gas flowrate to the turbine plant (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)**

4. The permittee shall maintain records of all information necessary for all notifications and reports as specified in these special conditions as well as that information necessary to demonstrate compliance with the emission limits of this permit for EUTURBINE4. 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) Total sulfur content of the desulfurized landfill gas;
   c) The percent methane of the desulfurized landfill gas, weekly;
   d) All records required by 40 CFR 60.7;
   e) Records of the duration and all dates and times of startup and shutdown events;

f) All calculations necessary to show compliance with the limits contained in this permit;
g) All records related to, or as required by, the MAP and the startup and shutdown plan.

All of the above information shall be stored in a format acceptable to the AQD District Supervisor and shall be consistent with the requirements of 40 CFR 60.7(f). **(R 336.1205, R 336.1224, R 336.1225, R 336.1331, R 336.1702, R 336.1912, R 336.2803, R 336.2804, 40 CFR 60.7(f), 40 CFR 60.4360, 40 CFR 60.4365, 40 CFR 60.4375, 40 CFR Part 60 Subpart KKKK)**

VII. REPORTING

1. Within 30 days after EUTURBINE4 begins using desulfurized landfill gas, the permittee or the authorized agent shall notify the AQD District Supervisor, in writing. **(R 336.1201)**

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. SVTURBINE4	42	50	R 336.1225, R 336.2803, R 336.2804

IX. OTHER REQUIREMENT(S)

1. The Permittee shall comply with all applicable provisions of Subparts A and KKKK of the New Source Performance Standards for Stationary Gas Turbines as they apply to EUTURBINE4. **(40 CFR Part 60 Subpart KKKK)**

2. The Permittee shall comply with all applicable provisions of Subpart A and YYYY of the National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines as they apply to EUTURBINE4. **(40 CFR Part 63 Subpart YYYY)**

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

FLEXIBLE GROUP SPECIAL CONDITIONS

FLEXIBLE GROUP SUMMARY TABLE

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

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FGTURBINES	Three (3) EGT-Typhoon turbines and associated duct burner that use desulfurized landfill gas as fuel for the generation of electricity for the power grid.	EUTURBINE/DB1, EUTURBINE/DB2, EUTURBINE/DB3
FGPROJECT23	The project requires operating hours restrictions on each turbine and associated duct burner, and to limit the gas burned in each unit to only desulfurized landfill gas.	EUTURBINE/DB1, EUTURBINE/DB2, EUTURBINE/DB3, EUTURBINE4

FGTURBINES
FLEXIBLE GROUP CONDITIONS

DESCRIPTION

Three (3) EGT-Typhoon turbines and associated duct burners that use landfill gas as fuel for the generation of electricity for the power grid.

Emission Unit: EUTURBINE/DB1, EUTURBINE/DB2, EUTURBINE/DB3

POLLUTION CONTROL EQUIPMENT

Sulfur Treatment System (STS)

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. NOx	11.3 pph (normal operation with duct burner)	Hourly	Each turbine and duct burner in FGTURBINES	SC V.2, SC VI.6	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
2. NOx	17.4 pph (includes startup)	Hourly	Each turbine in FGTURBINES	SC VI.6	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
3. NOx	See Appendix 7	Hourly	Each turbine in FGTURBINES	SC V.1, SC VI.6	40 CFR 60.332, Subpart GG
4. NOx	69.9 tpy	12-month rolling time period as determined at the end of each calendar month	FGTURBINES	SC VI.3, SC VI.6	R 336.1205(1)(a) & (b)
5. CO	15.4 pph (normal operation with duct burner)	Hourly	Each turbine and duct burner in FGTURBINES	SC V.2, SC VI.6	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
6. CO	2.0 pph (includes startup)	Hourly	Each turbine in FGTURBINES	SC VI.6	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
7. CO	61.8 tpy	12-month rolling time period as determined at the end of each calendar month	FGTURBINES	SC VI.3, SC VI.6	R 336.1205(1)(a) & (b)
8. SO_2	0.5 pph (normal operation with duct burner)	Hourly	Each turbine and duct burner in FGTURBINES	SC V.3, SC VI.6	R 336.1205(1)(a) & (b), R 336.2803, R 336.2804
9. VOC (includes formaldehyde)	2.9 pph (normal operation with duct burner)	Hourly	Each turbine and duct burner in FGTURBINES	SC. V.2, SC VI.6	R 336.1205(1)(a) & (b), R 336.1702(c)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
10. Hydrogen Chloride	1.9 pph	Hourly	Each turbine in FGTURBINES	SC V.4, SC VI.6	R 336.1225

II. MATERIAL LIMIT(S)

Material	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. Diesel Fuel	19,000 gal/yr	12-month rolling time period as determined at the end of each calendar month	FGTURBINES	SC VI.2, SC VI.5	R 336.1205(1)(a) & (b)
2. Diesel Fuel	71.4 gal/hr	Hourly	Each Turbine in FGTURBINES	SC VI.3	R336.1205, R336.1224, R336.1225, R 336.2803, R 336.2804

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. The permittee shall only burn desulfurized landfill gas and diesel fuel with total sulfur of 0.05 weight percent (500 ppmw) or less, as fuel in FGTURBINES.**(R336.1205, R336.1224, R336.1225, R 336.2803, R 336.2804)**

2. The permittee shall only operate FGTURBINES when EURNGTOX or EUOFRNG are not operating. **(R336.1205, R336.1224, R336.1225, R 336.2803, R 336.2804)**

3. The permittee shall not operate FGTURBINES unless a malfunction abatement plan (MAP) as described in Rule 911(2), has been submitted within 180 days of initial start-up, and is implemented and maintained. The MAP shall, at a minimum, specify the following:

   a) A complete preventative maintenance program including identification of the supervisory personnel responsible for overseeing the inspection, maintenance, and repair of air-cleaning devices, a description of the items or conditions that shall be inspected, the frequency of the inspections or repairs, and an identification of the major replacement parts that shall be maintained in inventory for quick replacement.
   b) An identification of the source and fuel-cleaning equipment operating variables that shall be monitored to detect a malfunction or failure, the normal operating range of these variables, and a description of the method of monitoring or surveillance procedures.
   c) 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 MAP fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the permittee shall amend the MAP within 45 days after such an event occurs. The permittee shall also amend the MAP within 45 days, if new equipment is installed or upon request from the District Supervisor. The permittee shall submit the MAP and any amendments to the MAP to the AQD District Supervisor for review and approval. If the AQD does not notify the permittee within 90 days of submittal, the MAP or amended 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)**

4. The permittee must operate and maintain FGTURBINES, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction. **(R 336.1205, R 336.911)**

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The heat input capacity of each turbine and duct burner in FGTURBINES shall not exceed a maximum of 58.7 MMBTU per hour and 10.2 MMBTU per hour, respectively. **(R336.1205, R 336.2803, R 336.2804)**

2. The permittee shall not operate FGTURBINES unless a device to continuously monitor and record the total landfill gas flow rate from to FGTURBINES is installed, maintained, and operated in a satisfactory manner acceptable to the AQD District Supervisor. **(R336.1205, R 336.2803, R 336.2804)**

3. The permittee shall not operate FGTURBINES unless a device to monitor and record the BTU content of the landfill gas at least once each calendar week is installed, maintained, and operated in a satisfactory manner acceptable to the AQD District Supervisor. **(R336.1205, R 336.2803, R 336.2804)**

4. The permittee shall only use landfill gas in FGTURBINES which has been treated to remove sulfur by the AQD approved treatment system. **(R336.1205, R336.1224, R336.1225, 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 permit issuance, and once every five years thereafter, the permittee shall verify NOx emission rates from each unit in FGTURBINES by testing at owner's expense, in accordance with Department requirements and 40 CFR 60.332(a)(2) and Appendix 7. Testing shall be performed using an approved EPA Method listed in the table below:

Pollutant	Test Method Reference
NOx	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 and must meet the requirements of the federal Clean Air Act, all applicable state and federal rules and regulations, and be within the authority of the AQD to make the change. 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. The duct burners are not required to be operated during the stack test unless they have commenced operation since permit issuance. Within 90 days of restart of the duct burners, testing shall be performed. **(R 336.1205, R 336.2001, R 336.2003, R 336.2004, R 336.2803, R 336.2804, 40 CFR 60.332, 40 CFR 60.335)**

2. Once every five years the permittee shall verify NOx, CO, SO_2, and VOC emission rates from each unit with duct burners on and off in FGTURBINES 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:

Pollutant	Test Method Reference
NO_x	40 CFR Part 60, Appendix A
CO	40 CFR Part 60, Appendix A
VOC	40 CFR Part 60, Appendix A
SO_2	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 and must meet the requirements of the federal Clean Air Act, all applicable state and federal rules and regulations, and be within the authority of the AQD to make the change. 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. The duct burners are not required to be operated during the stack test unless they have commenced

operation since permit issuance. Within 90 days of restart of the duct burners, testing shall be performed. **(R 336.1205, R 336.1225, R 336.2001, R 336.2003, R 336.2004, R 336.2803, R 336.2804)**

3. The permittee shall verify SO_2 emission rates from one of the three turbines and associated duct burners on and off in FGTURBINES by testing at owner's expense on an annual basis, in accordance with Department requirements. No two annual tests shall be conducted less than 11 months apart. Testing shall be performed using an approved EPA Method listed in the table below:

Pollutant	Test Method Reference
SO_2	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 and must meet the requirements of the federal Clean Air Act, all applicable state and federal rules and regulations, and be within the authority of the AQD to make the change. 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. The duct burners are not required to be operated during the stack test unless they have commenced operation since permit issuance. Within 90 days of restart of the duct burners, testing shall be performed. **(R 336.1205, R 336.1225, R 336.2001, R 336.2003, R 336.2004, R 336.2803, R 336.2804)**

4. Once every five years, the permittee shall verify hydrogen chloride emission rates from each unit in FGTURBINES, 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:

Pollutant	Test Method Reference
Hydrogen Chloride	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. The duct burners are not required to be operated during the stack test unless they have commenced operation since permit issuance. Within 90 days of restart of the duct burners, testing shall be performed. **(R 336.1225, R 336.2001, R 336.2003, R 336.2004)**

5. The permittee shall perform a visible emission observation when any turbine in FGTURBINES is operating using diesel fuel during daylight hours, excluding startup or shutdown events, using a method acceptable to the AQD. If the permittee observes visible emissions, the permittee shall do one of the following:
   a) Perform a Method 9 for visible emissions. If after performing the Method 9 visible emissions reading, the permittee determines that visible emissions from the observation points exceed 20% opacity, the permittee shall immediately initiate an investigation to determine the cause of the visible emissions and initiate prompt corrective action: or
   b) Determine the cause of the visible emissions and initiate prompt corrective action.

   Records will include the time of each visible emissions observation and Method 9 reading, the reason if an observation or reading is not taken, if visible emissions were observed, identification of the cause, the corrective action taken, and the time of completion of corrective action. **(R 336.1301)**

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, a record of the total of each fuel combusted in FGTURBINES on a monthly and 12-month rolling time period basis. 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)**

3. The permittee shall keep, in a satisfactory manner, a record of the total gallons of diesel fuel combusted in each turbine of FGTURBINES on an hourly basis. The permittee shall keep all records on file and make them available to the Department upon request. **(R 336.1205, R 336.1225, R 336.2001, R 336.2003, R 336.2004, R 336.2803, R 336.2804)**

4. The permittee shall keep, in a satisfactory manner, a record of the total monthly and 12-month rolling NO_x, CO, and VOC emission rates from FGTURBINES. 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 monitor and record the following average daily landfill gas parameters:
   a) Heat input of the landfill gas (BTU/scf),
   b) Heat input of the landfill gas burned (MMBTU/day),
   c) Landfill gas flowrate to the turbine plant (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)**

6. The permittee shall maintain records of all information necessary for all notifications and reports as specified in these special conditions as well as that information necessary to demonstrate compliance with the emission limits of this permit for FGTURBINES. 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) Total sulfur content of the desulfurized landfill gas;
   c) The percent methane of the desulfurized landfill gas, weekly;
   d) The monthly amount of landfill gas combusted in the duct burners;
   e) All records required by 40 CFR 60.7;
   f) Records of the duration and all dates and times of startup and shutdown events;
   g) All calculations necessary to show compliance with the limits contained in this permit;
   h) All records related to, or as required by, the MAP and the startup and shutdown plan.

   All of the above information shall be stored in a format acceptable to the AQD District Supervisor and shall be consistent with the requirements of 40 CFR 60.7(f). **(R 336.1205, R 336.1224, R 336.1225, R 336.1331, R 336.1702, R 336.1912, R 336.2803, R 336.2804, 40 CFR 60.7(f), 40 CFR Part 60 Subpart Dc)**

VII. REPORTING

1. Within 30 days after FGTURBINES begins using desulfurized landfill gas, the permittee or the authorized agent shall notify the AQD District Supervisor, in writing. **(R 336.1201)**

2 Within 90 days after any of the duct burners in FGTURBINES re-starting operations, the permittee or the authorized agent shall notify the AQD District Supervisor, in writing. The permittee shall submit the complete test plans as specified in SC V.1, SC V.2, SC V.3 and SC V.4 within 60 days of the restart date.

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. SVTURBINE/DB1	47	45	R 336.1225, R 336.2803, R 336.2804
2. SVTURBINE/DB2	47	45	R 336.1225, R 336.2803, R 336.2804
3. SVTURBINE/DB3	47	45	R 336.1225, R 336.2803, R 336.2804

IX. OTHER REQUIREMENT(S)

1. The Permittee shall comply with all applicable provisions of Subparts A and Dc of the New Source Performance Standards for Small Industrial-Commercial-Institutional Steam Generating Units as they apply to the duct burners associated with EUTURBINE/DB1, EUTURBINE/DB2, and EUTURBINE/DB3 of FGTURBINES. **(40 CFR Part 60 Subpart Dc)**

2. The Permittee shall comply with all applicable provisions of Subparts A and GG of the New Source Performance Standards for Stationary Gas Turbines as they apply to the turbines of FGTURBINES. **(40 CFR Part 60 Subpart GG)**

3. The Permittee shall comply with all applicable provisions of Subpart A and YYYY of the National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines as they apply to FGTURBINES. **(40 CFR Part 63 Subpart YYYY)**

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

FGPROJECT23
FLEXIBLE GROUP CONDITIONS

DESCRIPTION

Flexible group created to restrict operating hours and to limit the amount and types of fuels burned in each turbine and associated ductburner.

Emission Unit: EUTURBINE/DB1, EUTURBINE/DB2, EUTURBINE/DB3, EUTURBINE4

POLLUTION CONTROL EQUIPMENT

Sulfur treatment System to remove sulfur in the landfill gas.

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. NOx	81.3 tpy	12-month rolling time period as determined at the end of each calendar month	FGPROJECT23	SC VI.2	R 336.1205(1)(a) & (3)
2. CO	79.6 tpy	12-month rolling time period as determined at the end of each calendar month	FGPROJECT23	SC VI.2	R 336.1205(1)(a) & (3)
3. SO_2	2.4 tpy	12-month rolling time period as determined at the end of each calendar month	FGPROJECT23	SC VI.2	R 336.1205(1)(a) & (3)
4. VOC	12.8 tpy	12-month rolling time period as determined at the end of each calendar month	FGPROJECT23	SC VI.2	R 336.1205(1)(a) & (3)

II. MATERIAL LIMIT(S)

Material	Limit	Time Period / Operating Scenario	Equipment	Monitoring / Testing Method	Underlying Applicable Requirements
1. Desulfurized Landfill Gas	1,425 MMscf/yr	12-month rolling time period as determined at the end of each calendar month	FGPROJECT23	SC VI.1	R 336.1205(1)(a) & (3)
2. Total Reduced Sulfur concentration in the landfill gas	No greater than 20 ppmv, measured as H_2S	Hourly	FGPROJECT23	SC V.1	R 336.1205(1)(a) & (b)

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))**

1. Within 15 days of the initial use of desulfurized landfill gas in FGPROJECT23, the permittee shall verify the H_2S 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 USEPA 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 H_2S in the landfill gas.

   Thereafter, the permittee shall verify the hydrogen sulfide (H_2S) or total reduced sulfur (TRS) content of the landfill gas burned in FGPROJECT23 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 H_2S (TRS equivalent) concentration of the landfill gas sample exceeds 20 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 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, a record of the total of each fuel combusted in FGPROJECT23 on a monthly and 12-month rolling time period basis. 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)**

2. The permittee shall keep, in a satisfactory manner, a record of the total monthly and 12-month rolling NOx, CO, SO_2, and VOC emission rates from FGPROJECT23. Calculations shall be performed according to Appendix 7 or a method acceptable to the AQD District Supervisor using the emission factors specified in APP-2022-0215 or 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)**

3. The permittee shall keep, in a satisfactory manner, records of the average daily vacuum (in H_2O) applied on the landfill gas from the turbine plant (FGPROJECT23). 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:
   a) Heat input of the landfill gas (BTU/scf),
   b) Heat input of the landfill gas burned (MMBTU/day),
   c) Landfill gas flowrate to the turbine plant (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 FGPROJECT23 begins using desulfurized landfill gas, the permittee or the authorized agent shall notify the AQD District Supervisor, in writing. **(R 336.1201)**

2. Within 15 days after the end of a calendar month, the permittee shall submit to the AQD District Supervisor the average daily vacuum (in H_2O) applied on the landfill gas from the turbine plant (FGPROJECT23), average heat input of the landfill gas, average daily heat content burned, average daily landfill gas flowrate through the turbine plant, for the previous month for FGPROJECT23, EURNGPLANT and/or Landfill Flares. **(R 336.1201)**

VIII. STACK/VENT RESTRICTION(S)

NA

IX. OTHER REQUIREMENT(S)

NA

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.

Calculation for mass emissions

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

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)

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

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).