STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

AHJRLLFG LLC **Penobscot County** **Old Town, Maine** **A-1150-71-C-A**	**Departmental** **Findings of Fact and Order** **Air Emission License** **Amendment #2**

FINDINGS OF FACT

After review of the air emission license amendment application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes (M.R.S.) § 344 and § 590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

AHJRLLFG LLC (Archaea) was issued Air Emission License A-1150-71-A-N on February 24, 2020, for the operation of emission sources associated with a renewable natural gas (RNG) processing facility. The license was subsequently amended on August 24, 2021 (A-1150-71-B-M).

The equipment addressed in this license will be located at 2828 Bennoch Road, Old Town, Maine.

Archaea has requested an amendment to their license in order to address changes to the proposed project and to allow the facility to begin operation before the natural gas pipeline is extended to the site. These changes include:

1. Increasing the plant's capacity to convert landfill gas (LFG) to RNG from 2,000 scfm LFG to approximately 3,200 scfm;
2. Replacing the two natural gas-fired non-emergency generators (Engines 1 and 2), which totaled 3.5 MW of power output, with eight diesel-fired non-emergency generators (Generators #1 - #8), which total 4.0 MW of power output;
3. Increasing the size of the thermal oxidizer (TO #1) which combusts tail gas from the RNG process from 4.74 MMBtu/hr to 12 MMBtu/hr;
4. Adding a 97.2 MMBtu/hr flare (Flare #1) for destruction of off-spec gas; and
5. Adding two natural gas-fired compressors to load RNG onto trucks for delivery off-site.

B. Emission Equipment

The following equipment is addressed in this air emission license amendment:

Process Equipment

Equipment	Production Rate
Gas Conversion Plant	3,200 scfm

The previously proposed 2,000 scfm gas conversion plant is replaced with a 3,200 scfm gas conversion plant.

Stationary Engines

Equipment	Max. Input Capacity (MMBtu/hr)	Rated Output Capacity	Fuel Type, % sulfur	Firing Rate	Date of Manuf.
Generator #1	5.07	580 kW 744 bhp	distillate fuel, 0.0015%	37 gal/hr	2022
Generator #2	5.07	580 kW 744 bhp	distillate fuel, 0.0015%	37 gal/hr	2022
Generator #3	5.07	580 kW 744 bhp	distillate fuel, 0.0015%	37 gal/hr	2022
Generator #4	5.07	580 kW 744 bhp	distillate fuel, 0.0015%	37 gal/hr	2022
Generator #5	5.07	580 kW 744 bhp	distillate fuel, 0.0015%	37 gal/hr	2022
Generator #6	5.07	580 kW 744 bhp	distillate fuel, 0.0015%	37 gal/hr	2022
Generator #7	5.07	580 kW 744 bhp	distillate fuel, 0.0015%	37 gal/hr	2022
Generator #8	5.07	580 kW 744 bhp	distillate fuel, 0.0015%	37 gal/hr	2022
Compressor #1	1.88	203 bhp	natural gas, 20 ppmv	31 scfm	2022
Compressor #2	1.88	203 bhp	natural gas, 20 ppmv	31 scfm	2022

Generators #1 - #8 replace previously licensed Engines 1 and 2. Compressors #1 and #2 are new equipment.

Other Fuel Burning Equipment

Equipment	Max. Capacity (MMBtu/hr)	Fuel Type	Date of Manuf.
TO #1	12	natural gas/propane tail gas	2020 or later
Flare #1	97.2	natural gas/propane off-spec gas	2022

C. Definitions

Continuous. For the purposes of this license, continuous means at least three (3) data points in each full operating hour with at least one (1) data point in each half-hour period.

Distillate Fuel means the following:

- Fuel oil that complies with the specifications for fuel oil numbers 1 or 2, as defined by the American Society for Testing and Materials (ASTM) in ASTM D396;
- Diesel fuel oil numbers 1 or 2, as defined in ASTM D975;
- Kerosene, as defined in ASTM D3699;
- Biodiesel, as defined in ASTM D6751; or
- Biodiesel blends, as defined in ASTM D7467.

Records or *Logs* mean either hardcopy or electronic records.

D. Application Classification

All rules, regulations, or statutes referenced in this air emission license refer to the amended version in effect as of the date this license was issued.

The modification of a minor source is considered a major or minor modification based on whether or not expected emission increases exceed the "Significant Emission" levels as defined in the Department's *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100. The emission increases are determined by subtracting the current licensed annual emissions preceding the modification from the maximum future licensed annual emissions, as follows:

Pollutant	Current License (tpy)	Future License (tpy)	Net Change (tpy)	Significant Emission Levels
PM	3.2	3.9	+0.7	100
PM_{10}	3.2	3.9	+0.7	100
SO_2	0.3	3.1	+2.8	100
NO_x	29.3	49.7	+20.4	100
CO	27.3	78.4	+51.1	100
VOC	20.4	19.7	-0.7	100

This modification is determined to be a minor modification and has been processed as such.

E. Facility Classification

With the limits on annual hours of operation and SO_2 emissions for Flare #1 the facility is licensed as follows:

- As a synthetic minor source of air emissions for SO_2 and CO because Archaea is subject to license restrictions that keep facility emissions below major source thresholds for criteria pollutants; and
- As an area source of hazardous air pollutants (HAP), because the licensed emissions are below the major source thresholds for HAP.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

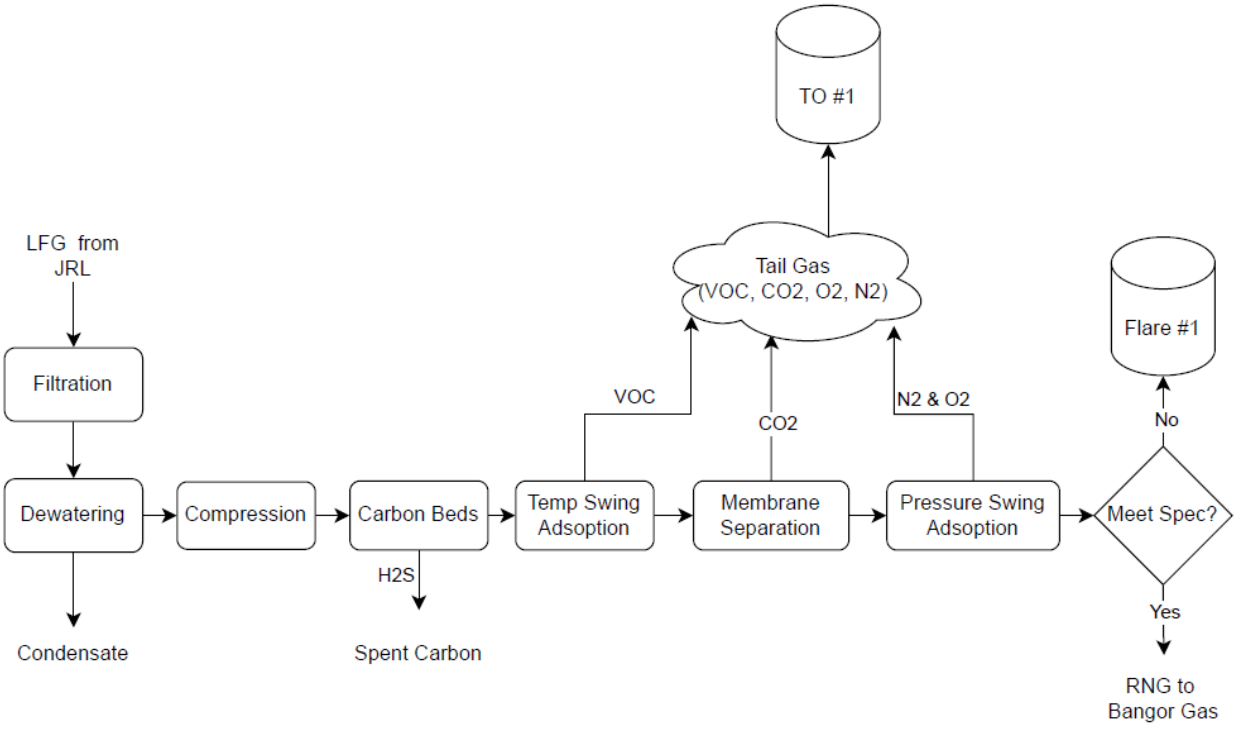
In order to receive a license, the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. Separate control requirement categories exist for new and existing equipment.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in *Definitions Regulation*, 06-096 C.M.R. ch. 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental, and energy impacts.

B. Process Description

Archaea's facility is designed to convert up to approximately 3,200 scfm of landfill gas (LFG) to a renewable natural gas (RNG) suitable for injection into the existing natural gas distribution system. LFG is approximately 50% methane which is an organic compound not regulated as a VOC. The function of the Archaea facility will be to remove diluents and contaminants from the LFG producing a gas which meets pipeline quality standards for natural gas. Diluents and contaminants to be removed from the LFG include (among others) total reduced sulfur (TRS) compounds, non-methane organic compounds (NMOC or VOC), oxygen, nitrogen, and carbon dioxide.

Juniper Ridge Landfill (JRL) uses vacuum blowers to extract LFG from the landfill. JRL will treat the LFG to a TRS level of 1,000 parts per million by volume on a dry basis (ppmdv) or less prior to delivery to the Archaea facility. Archaea will remove contaminants from the gas stream, including hydrogen sulfide (H_2S), siloxane, carbon dioxide (CO_2), VOC, nitrogen, and oxygen, to produce RNG that contains at least 94% methane. A simplified process flow diagram is shown below.



H_2S is removed from the gas stream through use of non-regenerative carbon scrubbers. The remaining contaminants described above (mostly CO_2, VOC, nitrogen, and oxygen) form a waste gas stream (tail gas) that will be combusted in a thermal oxidizer (TO #1).

Gas that is produced but does not meet pipeline specifications (e.g., too-low methane content) is considered off-spec gas. Any off-spec production gas will be combusted in a traditional landfill gas flare (Flare #1).

The local natural gas distribution pipeline does not currently extend to the Archaea facility, so initially, the RNG will be compressed using two natural gas-fired engines and trucked to an injection point. The distribution pipeline is expected to be extended to the Archaea facility within the next two to three years, at which point the RNG will be compressed and injected directly into the pipeline.

Power for the facility will initially be provided by trailer-mounted generators until the utility upgrades the power line to the site. Archaea anticipates this to occur in the next two to three years. When the power line to the facility is upgraded, it is anticipated that the engine-powered generators and compressors will be replaced with electrically driven equipment, with the generators in this license potentially being retained as emergency back-up units. However, this license assumes all generators are permanent, non-emergency, stationary installations. Any change to this designation will require an amendment to this air emission license.

C. Gas Processing

Archaea's process to convert LFG to RNG consists of the following major unit operations:

- Filtration;
- Dewatering (air-to-gas coolers and chiller processes followed by condensate recovery);
- Compression;
- Lead/lag vessels filled with activated carbon media for removal of H_2S down to 25 ppmdv or less;
- Temperature swing adsorption for siloxane and VOC removal;
- Membrane separation for CO_2 removal; and
- Pressure swing adsorption for nitrogen and oxygen removal.

Regulated air pollutants removed from the product gas stream include VOC, HAP, and H_2S.

1. Best Available Control Technology (BACT)

   a. Volatile Organic Compounds (VOC) and Hazardous Air Pollutants (HAP)
   Potential controls for VOC/HAP in the tail gas include catalytic oxidation and thermal oxidation. Both would destroy the VOC/HAP through oxidation to CO_2.

   The tail gas will contain contaminants that would quickly poison a catalyst. Therefore, catalytic oxidation is determined not to be technically feasible.

   Archaea has proposed the use of an enclosed thermal oxidizer (TO # 1) to control VOC and HAP in the tail gas. TO #1 will use a natural gas or propane flame to reach a destruction efficiency of 98% for NMOC (including VOC and HAP) or less than 20 ppmdv. This is the same standard as required by *Standards of Performance for Municipal Solid Waste Landfills That Commenced Construction, Reconstruction, or Modification After July 17, 2014*, 40 C.F.R. Part 60, Subpart XXX. In other words, Archaea has proposed meeting the same standard as the adjacent landfill.

   TO #1 will control up to 1,600 scfm of tail gas with the addition of 3,400 scfm of dilution air used for oxygen addition and temperature control (5,000 scfm total). It is designed to operate between 1,500 to 1,800 °F. TO #1 has a total heat input rating of 12 MMBtu/hr and will be equipped with a low-NO_x burner.

The Department finds that BACT for control of VOC and HAP emissions from the tail gas generated by the RNG process is the use of a thermal oxidizer which maintains a temperature of at least 1,300 °F and the emission limits listed in the table below for all operating times.

Compliance shall be demonstrated through continuous monitoring of the temperature inside the thermal oxidizer during all operating times and records of all operating times.

b. Sulfur Dioxide (SO_2)

H_2S is a regulated pollutant pursuant to 06-096 C.M.R. ch. 100, § 150(B) because there are several New Source Performance Standards that contain standards for H_2S. Additionally, the destruction of H_2S through combustion (e.g., flaring) results in proportional emissions of sulfur dioxide (SO_2), a criteria pollutant.

Adsorption is the process by which molecules collect on and adhere to the surface of an adsorbent solid due to physical and/or chemical forces. Activated carbon is typically used as an adsorbent because of its large surface area which is a critical factor in the adsorption process. As gas passes through the carbon scrubber, H_2S is adsorbed onto the activated carbon. Before the activated carbon is saturated, the scrubber must be taken off-line and the spent media replaced. The control efficiency of carbon scrubbers for H_2S removal ranges from 90 – 99% depending on the inlet H_2S concentration.

Archaea has proposed the use of carbon scrubbers for removal of H_2S from the LFG prior to combustion in any additional control device. The carbon scrubbers will operate in a parallel "lead/lag" formation and will ensure the H_2S concentration in the exhaust gas is reduced to 25 ppmdv or less prior to combustion in any additional control device. Additional controls of SO_2 at this level is determined not to be economically feasible.

The Department finds that BACT for H_2S and SO_2 emissions from the RNG process is the use of carbon scrubbers, an H_2S concentration limit of 25 ppmdv on a 12-month rolling average basis, and the emission limit listed in the table below for all operating times.

The limits apply at all times. Compliance with the H_2S ppmdv limit shall be demonstrated by sampling the concentration of the H_2S in the gas exiting the control equipment (i.e., the carbon scrubber outlet) at least once per calendar week using a handheld monitor or equivalent. Weekly measurements shall be used to develop a monthly average. The handheld monitor or equivalent shall be operated, calibrated, and maintained in accordance with the manufacturer's specifications.

At least annually, Archaea shall test the tail gas exiting the carbon scrubbers three times during a single day using ASTM Test Method D5504, or other methods as approved by the Department, to analyze for H_2S and total sulfur. Concurrent with the annual test, measurements of H_2S shall be taken with the handheld monitor or equivalent. If the results of the handheld (or equivalent) sampling do not correspond within reasonable accuracy to the annual test results, Archaea shall re-assess/replace/recalibrate the handheld monitor, or equivalent, as appropriate to obtain valid sampling results.

For the weekly and annual H_2S sampling required by this license, Archaea shall develop a written, site-specific monitoring plan that addresses methods and equipment used, data collection, and the quality assurance and quality control elements. The monitoring plan shall be submitted to the Department for approval prior to startup of the RNG process.

Archaea shall keep records of any maintenance activities performed (planned or unplanned) on TO #1 and the carbon scrubbers.

c. Emission Limits

The BACT emission limits for TO #1 are based on the following:

PM/PM_{10}	–	0.00765 lb/MMBtu based on AP-42 Table 1.5-1 dated 7/08
SO_2	–	0.41 lb/hr based on an H_2S concentration of 25 ppmdv
NO_x	–	0.142 lb/MMBtu based on AP-42 Table 1.5-1 dated 7/08
CO	–	0.20 lb/MMBtu based on manufacturer data
VOC	–	20 ppmdv per manufacturer data
Visible Emissions	–	06-096 C.M.R. ch. 115, BACT

The BACT emission limits for TO #1 are the following:

Unit	Pollutant	lb/MMBtu
TO #1	PM	0.008

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
TO #1	0.09	0.09	0.41	1.70	2.40	0.70

Visible emissions from TO #1 shall not exceed 10% opacity on a six-minute block average basis. Compliance shall be demonstrated by testing in accordance with 40 C.F.R. Part 60, Appendix A, Method 9 upon request by the Department.

The Department has determined that the BACT visible emission limit is more stringent than the applicable limit in 06-096 C.M.R. ch. 101. Therefore, the visible

emission limit for TO #1 has been streamlined to the more stringent BACT limit, and only this more stringent limit shall be included in the air emission license.

2. New Source Performance Standards (NSPS)

Archaea has stated that the proposed facility will not include any equipment listed in §§ 60.5365a(a) through (j). In which case, Archaea is not subject to *Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015*, 40 C.F.R. Part 60, Subpart OOOOa.

3. National Emission Standards for Hazardous Air Pollutants (NESHAP)

Archaea has stated that the facility will not include a triethylene glycol dehydration unit. As such, there are no affected sources at the facility which would be subject to *National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities*, 40 C.F.R. Part 63, Subpart HH. [40 C.F.R. § 63.760(b)(2)]

Archaea is not subject to *National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities*, 40 C.F.R. Part 63, Subpart HHH because it is not a major source of HAP. [40 C.F.R. § 63.1270(a)]

D. Flare #1

In Air Emission License A-1150-71-A-N (2/24/2020), any product gas that was not injected into the pipeline or used on-site was to be returned to JRL for combustion in the facility's flares. With this amendment, Archaea proposes to install their own flare for destruction of off-spec process gas. Flare #1 is rated at 3,200 scfm (at 50% methane) which is equivalent to 97.2 MMBtu/hr. Flare #1 will use either natural gas or propane as an assist gas to maintain flame stability.

1. BACT Findings

Emissions of PM, PM_{10}, NO_x, CO, and VOC from Flare #1 are dependent upon the heat content of the gas sent to the flare and hours of operation. Short-term emission limits (lb/hr) have been based on the emission factors listed in the table below, the maximum expected flowrate (3,200 scfm), and the heat content of raw landfill gas (506 Btu/scf). Archaea has proposed an operational throughput limit of 243,000 MMBtu/year to limit annual emissions. This limit is equivalent to operating at full capacity for 2,500 hr/year.

The Department finds that BACT for PM, PM_{10}, NO_x, CO, and VOC emissions from Flare #1 is an annual operational limit of 243,000 MMBtu/year on a calendar year basis and the emission limits listed in the table below for all operating times. Compliance

shall be demonstrated through recordkeeping of the amount of gas (scf) and the heat content of the gas (based on methane content).

Flare #1 will be used to control regulated pollutants including VOC and H_2S through thermal destruction. BACT for control of VOC and H_2S includes having flame present during all flare operating times. Compliance shall be demonstrated by continuous monitoring of Flare #1 for either temperature or presence of flame during all operating times.

Combustion of off-spec product gas in Flare #1 will convert any sulfur compounds, including H_2S, to SO_2. Archaea states that only gas which has been treated by the carbon scrubbers (see Gas Processing above) will be sent to Flare #1. The carbon scrubbers will ensure the concentration of H_2S in the exhaust gas is reduced to 25 ppmdv or less prior to combustion in any additional control device. Additional controls of SO_2 at this level is determined not to be economically feasible.

The Department finds that BACT for SO_2 emissions from Flare #1 is the use of carbon scrubbers, an H_2S concentration limit for the gases being combusted of 25 ppmdv on a 12-month rolling average basis, and the emission limit listed in the table below for all operating times.

The limits apply at all times. Compliance with the H_2S ppmdv limit shall be demonstrated by sampling the concentration of the H_2S in the gas exiting the control equipment (i.e., the carbon scrubber outlet) at least once per calendar month using a handheld monitor or equivalent. The handheld monitor or equivalent shall be operated, calibrated, and maintained in accordance with the manufacturer's specifications.

At least annually, Archaea shall test the gas exiting the carbon scrubbers three times during a single day using ASTM Test Method D5504, or other methods as approved by the Department, to analyze for H_2S and total sulfur. Concurrent with the annual test, measurements of H_2S shall be taken with the handheld monitor or equivalent. If the results of the handheld (or equivalent) sampling do not correspond within reasonable accuracy to the annual test results, Archaea shall re-assess/replace/recalibrate the handheld monitor, or equivalent, as appropriate to obtain valid sampling results.

For the monthly and annual H_2S sampling required by this license, Archaea shall develop a written site-specific monitoring plan that addresses methods and equipment used, data collection, and the quality assurance and quality control elements. The monitoring plan shall be submitted to the Department for approval prior to startup of the RNG process.

Archaea shall keep records of any maintenance activities performed (planned or unplanned) on Flare #1 and the carbon scrubbers.

2. Emission Limits

The BACT emission limits for Flare #1 were based on the following:

PM/PM_{10}	–	17 lb/MMscf of methane based on AP-42 Table 2.4-5 dated 11/98
SO_2	–	0.81 lb/hr based on an H_2S concentration of 25 ppmdv
NO_x	–	0.068 lb/MMBtu based on AP-42 Table 13.5-1 dated 2/18
CO	–	0.31 lb/MMBtu based on AP-42 Table 13.5-2 dated 2/18
VOC	–	340.47 ppmdv based on manufacturer specs
Visible Emissions	–	06-096 C.M.R. ch. 115, BACT

The BACT emission limits for Flare #1 are the following:

Unit	Pollutant	lb/MMBtu
Flare #1	PM	0.02

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Flare #1	1.63	1.63	0.81	6.61	30.13	0.32

Visible emissions from Flare #1 shall not exceed 10% opacity on a six-minute block average basis. Compliance shall be demonstrated by testing in accordance with 40 C.F.R. Part 60, Appendix A, Method 9 upon request by the Department.

The Department has determined that the BACT visible emission limit is more stringent than the applicable limit in 06-096 C.M.R. ch. 101. Therefore, the visible emission limit for Flare #1 has been streamlined to the more stringent BACT limit, and only this more stringent limit shall be included in the air emission license.

E. Gas Releases

Emergency shutdowns (ESD), ESD testing, and routine maintenance of facility piping may result in venting of natural gas or LFG to the atmosphere. These activities are necessary for safety reasons, and no specific short-term emission limit is imposed to restrict these activities. However, annual emissions of VOC from gas releases and fugitive emissions combined shall not exceed 5.0 tpy, and whenever possible, planned venting events shall be vented to Flare #1.

Archaea shall maintain a log of all gas releases and ESD events that include the following information:

1. Date of the event;
2. Estimated or actual event start time;
3. Estimated or actual event duration;
4. Event source;
5. Event type (shutdown, maintenance, testing, or malfunction);
6. Description of event; and
7. Estimate of the amount of natural gas/LFG vented.

Archaea shall notify the Department in advance of any scheduled venting event that is expected to result in the release of more than 85,000 scf of natural gas or LFG. Archaea shall notify the Department within two working days of any unscheduled venting event that results in the release of more than 85,000 scf of natural gas or LFG.

Emissions from gas releases (including emissions of VOC and methane) shall be reported to the Department annually as part of the facility's emissions inventory collected per *Emission Statements*, 06-096 C.M.R. ch. 137.

F. Fugitive Emissions

Operation of the facility's equipment and plant piping will result in fugitive emissions of gas. Annual emissions of VOC from gas releases and fugitive emissions combined shall not exceed 5.0 tpy.

Archaea shall keep an updated inventory of equipment (e.g., valves, pump seals, connectors, flanges, etc.) and calculate fugitive emissions on a calendar year basis using emission factors obtained from EPA's *Protocol for Equipment Leak Emission Estimates*, EPA-453/R-95-017, Table 2-4, dated November 1995.[1]

These fugitive emissions (including VOC and methane) shall be reported to the Department annually as part of the facility's emissions inventory collected per *Emission Statements*, 06-096 C.M.R. ch. 137.

G. Generators #1 - #8

Power for the facility will initially be provided by eight trailer-mounted generator sets. Each generator set consists of a 500 ekW electrical generator powered by a 744 bhp (580 kW) distillate-fired engine. Each trailer houses two generators, and each generator engine exhausts through its own stack which will be approximately 14 feet above ground level.

[1] https://www3.epa.gov/ttnchie1/efdocs/equiplks.pdf

1. BACT

Archaea submitted a BACT analysis for control of emissions from Generators #1 - #8.

a. Particulate Matter (PM, PM_{10}), Nitrogen Oxides (NO_x), and Volatile Organic Compounds (VOC)

As new, non-emergency, distillate-fired, stationary engines, Generators #1 - #8 are subject to stringent emission standards (Tier 4) for PM, NO_x and VOC contained in 40 C.F.R. Part 60, Subpart IIII as described below. The proposed engines are certified to these standards and are equipped with an oxidation catalyst, diesel particulate filter, ammonia slip catalyst, and selective catalytic reduction. The performance test results associated with that certification demonstrates that the standards are met across all load cases. Therefore, emission limits for these pollutants have been proposed which are based on the emission standards contained in 40 C.F.R. Part 60, Subpart IIII. This represents the highest level of control.

The Department determines that BACT for PM, PM_{10}, NO_x, and VOC emissions from Generators #1 - #8 is the firing of distillate fuel and the emission limits listed in the table below.

b. Sulfur Dioxide (SO_2)

Archaea has proposed to fire only ultra-low sulfur distillate fuel (15 ppm) in Generators #1 - #8. The use of this fuel results in minimal emissions of SO_2, and additional add-on pollution controls are not economically feasible due to the cost of control equipment compared to the relatively small amount of pollutant controlled.

The Department determines that BACT for SO_2 emissions from Generators #1 - #8 is the firing of distillate fuel with a sulfur content of 0.0015% by weight (15 ppm) and the emission limit listed in the table below.

c. Carbon Monoxide (CO)

As new, non-emergency, distillate-fired, stationary engines, Generators #1 - #8 are subject to stringent emission standards (Tier 4) for CO contained in 40 C.F.R. Part 60, Subpart IIII as described below. The proposed engines are certified to these standards and are equipped with an oxidation catalyst, diesel particulate filter, ammonia slip catalyst, and selective catalytic reduction. The performance test results associated with that certification reported zero emissions of CO across all load cases. Based on the extremely low test results, the Department is confident that a proposed emission limit based on 0.5 g/kW-hr will be met. This represents the highest level of control.

The Department determines that BACT for CO emissions from Generators #1 - #8 is the firing of distillate fuel and the emission limit listed in the table below.

d. Emission Limits

The BACT emission limits for Generators #1 - #8 were based on the following:

PM/PM_{10}	–	0.03 g/kW-hr based on 40 C.F.R. Part 60, Subpart IIII
SO_2	–	combustion of distillate fuel with a maximum sulfur content not to exceed 15 ppm (0.0015% sulfur by weight)
NO_x	–	0.67 g/kW-hr based on 40 C.F.R. Part 60, Subpart IIII
CO	–	0.50 g/kW-hr based on 06-096 C.M.R. ch. 115, BACT
VOC	–	0.19 g/kW-hr based on 40 C.F.R. Part 60, Subpart IIII
Visible Emissions	–	06-096 C.M.R. ch. 115, BACT

The BACT emission limits for Generators #1 - #8 are the following:

Unit	Pollutant	lb/MMBtu
Generators #1 - #8 (each)	PM	0.01

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Generators #1 - #8 (each)	0.04	0.04	0.01	0.86	0.64	0.24

Visible emissions from each generator (Generators #1 - #8) shall not exceed 20% opacity on a six-minute block average basis.

The Department has determined that the BACT visible emission limit is more stringent than the applicable limit in 06-096 C.M.R. ch. 101. Therefore, the visible emission limit for the generators has been streamlined to the more stringent BACT limit, and only this more stringent limit shall be included in the air emission license.

2. Chapter 169

Stationary Generators, 06-096 C.M.R. ch. 169 (Chapter 169), is applicable to Generators #1 - #8. They are non-emergency generators powered by an engine with a rated output of less than 1,000 brake horsepower (747 kW). Chapter 169 identifies emission standards for generator engines subject to this chapter and stack height requirements for certain generator engines subject to this chapter.

a. Chapter 169 Emission Standards Requirements

For Generators #1 - #8, Archaea shall comply with the emission standards for non-emergency generators by complying with the applicable standards contained in 40 C.F.R. Part 60, Subpart IIII. [06-096 C.M.R. ch. 169, § 4(A)]

b. Chapter 169 Stack Height Requirements
Chapter 169 identifies stack height requirements for any stack used to exhaust a generator engine or combination of generator engines with a combined rated output equal to or greater than 1,000 brake horsepower (747 kW). Individual generator engines with a maximum power capacity of less than 300 kW are not included in the assessment of the combined generator power capacity exhausted through a common stack. [06-096 C.M.R. ch. 169, § 6]

Generators #1 - #8 each have engines less than 1,000 bhp and each engine exhausts through its own dedicated stack. Therefore, the stack height requirements in 06-096 C.M.R. ch. 169 do not apply to this equipment.

3. New Source Performance Standards

Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, 40 C.F.R. Part 60, Subpart IIII is applicable to Generators #1 - #8 since these units were ordered after July 11, 2005, and manufactured after April 1, 2006. [40 C.F.R. § 60.4200] By meeting the requirements of 40 C.F.R. Part 60, Subpart IIII, the units also meet the requirements found in the *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 C.F.R. Part 63, Subpart ZZZZ. [40 C.F.R. § 63.6590(c)]

Below is a summary of the currently applicable federal 40 C.F.R. Part 60, Subpart IIII requirements.

a. The engines shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in 40 C.F.R. § 60.4201(a). [40 C.F.R. §§ 60.4204(b) and 4211(c)]

b. The fuel fired in the engines shall not exceed 15 ppm sulfur (0.0015% sulfur). [40 C.F.R. § 60.4207(b)]

c. The engines shall be operated and maintained according to the manufacturer's emission-related written instructions. Archaea may only change those emission-related settings that are permitted by the manufacturer. [40 C.F.R. §§ 60.4211(a) and (c)]

d. Each engine's diesel particulate filter shall be installed with a backpressure monitor that notifies Archaea when the high backpressure limit of the engine is approached. [40 C.F.R. § 60.4209(b)]

e. Archaea shall keep records of any corrective action taken after the backpressure monitor has indicated that the high backpressure limit of the engine is approached. [40 C.F.R. § 60.4213(c)]

H. Compressors #1-2

Archaea has proposed the use of two trailer-mounted compressors (a main compressor and a booster compressor) to compress the RNG either for direct injection into the natural gas pipeline or to be loaded onto trucks for delivery to a different injection point. Each compressor is powered by a Caterpillar 3306 TA natural gas-fired engine. Each engine is rated at 203 bhp (151 kW) and exhausts through its own stack which will be approximately 14 feet above ground level.

1. BACT Findings

Archaea submitted a BACT analysis for control of emissions from Compressors #1 - #2.

a. Particulate Matter (PM/PM_{10})
Archaea has proposed to burn only low-ash content fuels (natural gas) in Compressors #1 - #2. Additional add-on pollution controls are not economically feasible due to the cost of control equipment compared to the relatively small amount of pollutant controlled.

The Department has determined that BACT for PM/PM_{10} emissions from Compressors #1 - #2 is the firing of natural gas and the emission limits listed in the table below.

b. Sulfur Dioxide (SO_2)
Archaea has proposed to fire only natural gas in Compressors #1 - #2. The use of this fuel results in minimal emissions of SO_2, and additional add-on pollution controls are not economically feasible due to the cost of control equipment compared to the relatively small amount of pollutant controlled.

The Department has determined that BACT for SO_2 emissions from Compressors #1 - #2 is the firing of natural gas and the emission limits listed in the table below.

c. Nitrogen Oxides (NO_x), Carbon Monoxide (CO), and Volatile Organic Compounds (VOC)
Archaea has proposed the use of a three-way catalyst to control emissions of NO_x, CO, and VOC to the levels required by 40 C.F.R. Part 60, Subpart JJJJ (described further below).

Three-way catalytic converters are designed to perform multiple oxidation reactions and reduction reactions simultaneously. The specially formulated catalyst allows the reduction of NO_x by CO and the oxidation of CO and VOC by oxygen to occur at the same time. It functions most efficiently in rich-burn engines, slightly below the stoichiometric point. Three-way catalysts are typically used with an air-

to-fuel ratio (AFR) controller to maintain a slightly rich mixture. AFR controllers use a feedback signal from an oxygen sensor located in the front of the catalyst.

The Department has determined that BACT for emissions of NO_x, CO, and VOC from Compressors #1 - #2 is the firing of natural gas, use of a three-way catalyst, use of an engine compliant with 40 C.F.R. Part 60, Subpart JJJJ, and the emission limits listed in the table below.

d. Emission Limits

The BACT emission limits for Compressors #1 - #2 were based on the following:

PM/PM_{10}	- 9.50×10^{-3} lb/MMBtu based on AP-42 Table 3.2-3 dated 7/00
SO_2	- 5.88×10^{-4} lb/MMscf based on AP-42 Table 3.2-3 dated 7/00
NO_x	- 1.00 g/bhp-hr based on vendor guarantee and 40 C.F.R. Part 60, Subpart JJJJ
CO	- 2.00 g/bhp-hr based on vendor guarantee and 40 C.F.R. Part 60, Subpart JJJJ
VOC	- 0.70 g/bhp-hr based on vendor guarantee and 40 C.F.R. Part 60, Subpart JJJJ
Opacity	- 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for Compressors #1 - #2 are the following:

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Compressors #1 - #2 (each)	0.02	0.02	0.01	0.45	0.90	0.31

Visible emissions from each compressor (Compressors #1 - #2) shall not exceed 10% opacity on a six-minute block average basis.

The Department has determined that the BACT visible emission limit is more stringent than the applicable limit in 06-096 C.M.R. ch. 101. Therefore, the visible emission limit for the compressors has been streamlined to the more stringent BACT limit, and only this more stringent limit shall be included in the air emission license.

2. Chapter 169

Stationary Generators, 06-096 C.M.R. ch. 169 (Chapter 169), is not applicable to Compressors #1 - #2 because they do not make electricity; and therefore are not considered stationary generators.

3. New Source Performance Standards

Standards of Performance for Spark Ignition Internal Combustion Engines, 40 C.F.R. Part 60, Subpart JJJJ is applicable to Compressors #1 - #2 since the units were ordered after June 12, 2006, and manufactured after July 1, 2008. [40 C.F.R. § 60.4230] By meeting the requirements of 40 C.F.R. Part 60, Subpart JJJJ, the units also meet the requirements found in the *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 C.F.R. Part 63, Subpart ZZZZ. [40 C.F.R. § 63.6590(c)]

The engines that power Compressors #1 - #2 are non-certified engines which use add-on controls (catalyst) and air-to-fuel ratio controllers (AFR controllers) to comply with the standards in 40 C.F.R. Part 60, Subpart JJJJ.

A summary of the currently applicable federal 40 C.F.R. Part 60, Subpart JJJJ requirements is listed below.

a. Emission Standards
Compressors #1 - #2 are subject to emission standards for non-emergency spark ignition natural gas-fired engines between 100 – 500 Hp manufactured after January 1, 2011 contained in 40 C.F.R. Part 63, Subpart JJJJ, Table 1 pursuant to 40 C.F.R. § 63.4233(e).

b. Control Requirements
The AFR controllers must be maintained and operated appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [40 C.F.R. § 60.4243(g)]

c. Compliance Demonstration
Within 60 days of achieving the maximum production rate, but not later than 180 days from initial startup, Archaea shall conduct an initial performance test on each engine to demonstrate compliance with the applicable NO_x, CO, and VOC emission standards in Table 1. [40 C.F.R. §§ 60.8(a) and 60.4243(b)(2)(i)]

Archaea shall provide 30-days' notice of any performance test to both the Department and EPA. [40 C.F.R. § 60.8(d)]

Performance tests shall be conducted in accordance with 40 C.F.R. § 60.4244 including, but not limited to, the following:

(1) Each performance test shall be conducted within 10% of 100% peak (or the highest achievable) load. [40 C.F.R. § 60.4244(a)]
(2) When calculating emissions of VOC, emissions of formaldehyde shall not be included. [40 C.F.R. § 60.4244(f)]

d. Maintenance Plan
Archaea shall keep a maintenance plan and records of conducted maintenance. Archaea shall, to the extent practicable, maintain and operate each engine in a manner consistent with good air pollution control practices for minimizing emissions. [40 C.F.R. § 60.4243(b)(2)(i)]

e. Reporting
Archaea shall submit a copy of each performance test report to the Department and EPA within 30 days after the test has been completed. [40 C.F.R. § 60.4245(d) and 06-096 C.M.R. ch. 115]

f. Recordkeeping
Archaea shall keep records of the following for Compressors #1 - #2:

(1) All notifications submitted to comply with this subpart;
(2) All maintenance conducted on each engine;
(3) Documentation that each engine meets the emission standards (e.g., copies of performance test reports).

[40 C.F.R. § 60.4245(a)]

I. Performance Test Protocol

For any performance testing required by this license, Archaea shall submit to the Department for approval a performance test protocol, as outlined in the Department's Performance Testing Guidance, at least 30 days prior to the scheduled date of the performance test. [06-096 C.M.R. ch. 115, BPT]

The Department's Performance Testing Guidance is available online at:
https://www.maine.gov/dep/air/emissions/testing.html

J. Emission Statements

Archaea is subject to emissions inventory requirements contained in *Emission Statements*, 06-096 C.M.R. ch. 137. Archaea shall maintain the following records in order to comply with this rule:

1. The amount of natural gas/propane and tail gas combusted in TO #1 on a monthly and calendar year basis;
2. The amount of natural gas/propane and process gas combusted in Flare #1 on a monthly and calendar year basis;
3. The sulfur content of the tail gas combusted in TO #1 and the process gas combusted in Flare #1;
4. The amount of distillate fuel fired in each generator (Generators #1 - #8) on a monthly and calendar year basis;
5. The sulfur content of the distillate fuel fired in the generators;

6. The amount of natural gas fired in each compressor (Compressors #1 - #2) on a monthly and calendar year basis;
7. Calculations of the annual VOC, greenhouse gases (GHG), and HAP emissions from gas releases and fugitive emissions; and
8. Hours each emission unit was active or operating on a monthly and calendar year basis.

Beginning in reporting year 2023 and every third year thereafter, Archaea shall report to the Department emissions of hazardous air pollutants as required by 06-096 C.M.R. ch. 137, § (3)(C). The Department will use these reports to calculate and invoice for the applicable annual air quality surcharge for the subsequent three billing periods. Archaea shall pay the annual air quality surcharge, calculated by the Department based on these reported emissions of hazardous air pollutants, by the date required in Title 38 M.R.S. § 353-A(3). [38 M.R.S. § 353-A(1-A)]

K. Annual Emissions

The table below provides an estimate of facility-wide annual emissions for the purposes of calculating the facility's annual air license fee and establishing the facility's potential to emit (PTE). Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included except when required by state or federal regulations. Maximum potential emissions were calculated based on the following assumptions:

- Operating Generators #1 - #8, Compressors #1 - #2, and TO #1 at full capacity for 8,760 hr/year each;
- Firing 243,000 MMBtu/year in Flare #1; and
- A VOC limit of 5.0 tpy for gas releases and fugitive emissions.

This information does not represent a comprehensive list of license restrictions or permissions. That information is provided in the Order section of this license.

Total Licensed Annual Emissions for the Facility
Tons/year
(used to calculate the annual license fee)

	PM	PM_{10}	SO_2	NO_x	CO	VOC
Generators #1 - #8	1.3	1.3	0.3	30.0	22.4	8.5
Compressors #1 - #2	0.2	0.2	–	3.9	7.8	2.7
TO #1	0.4	0.4	1.8	7.5	10.5	3.1
Flare #1	2.0	2.0	1.0	8.3	37.7	0.4
Gas Releases & Fugitives	–	–	–	–	–	5.0
Total TPY	**3.9**	**3.9**	**3.1**	**49.7**	**78.4**	**19.7**

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

III. AMBIENT AIR QUALITY ANALYSIS

The level of ambient air quality impact modeling required for a minor source is determined by the Department on a case-by case basis. In accordance with 06-096 C.M.R. ch. 115, an ambient air quality impact analysis is not required for a minor source if the total licensed annual emissions of any pollutant released do not exceed the following levels and there are no extenuating circumstances:

Pollutant	Tons/Year
PM_{10}	25
SO_2	50
NO_x	50
CO	250

The total licensed annual emissions for the facility are below the emission levels contained in the table above and there are no extenuating circumstances; therefore, an ambient air quality impact analysis is not required as part of this license amendment.

This determination is based on information provided by the applicant regarding the expected construction and operation of the proposed emission units. If the Department determines that any parameter (e.g., stack size, configuration, flow rate, emission rates, nearby structures, etc.) deviates from what was included in the application, the Department may require Archaea to submit additional information and may require an ambient air quality impact analysis at that time.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards, and
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License Amendment A-1150-71-C-A subject to the conditions found in Air Emission License A-1150-71-A-N, in amendment A-1150-71-B-M, and the following conditions.

Severability. The invalidity or unenforceability of any provision of this License Amendment or part thereof shall not affect the remainder of the provision or any other provisions. This License Amendment shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

To avoid confusion, ALL Conditions of Air Emission Licenses A-1150-71-A-N and A-1150-71-B-M are deleted and replaced with the following:

STANDARD CONDITIONS

(1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions (38 M.R.S. § 347-C).

(2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115. [06-096 C.M.R. ch. 115]

(3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both. [06-096 C.M.R. ch. 115]

(4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive dust, and shall submit a description of the program to the Department upon request. [06-096 C.M.R. ch. 115]

(5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S. § 353-A. [06-096 C.M.R. ch. 115]

(6) The license does not convey any property rights of any sort, or any exclusive privilege. [06-096 C.M.R. ch. 115]

(7) The licensee shall maintain and operate all emission units and air pollution systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions. [06-096 C.M.R. ch. 115]

(8) The licensee shall maintain sufficient records to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request. [06-096 C.M.R. ch. 115]

(9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for a renewal of a license or amendment shall not stay any condition of the license.
[06-096 C.M.R. ch. 115]

(10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license.
[06-096 C.M.R. ch. 115]

(11) In accordance with the Department's air emission compliance test protocol and 40 C.F.R. Part 60 or other method approved or required by the Department, the licensee shall:

A. Perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:
   1. Within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or
   2. Pursuant to any other requirement of this license to perform stack testing.

B. Install or make provisions to install test ports that meet the criteria of 40 C.F.R. Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and

C. Submit a written report to the Department within thirty (30) days from date of test completion.

[06-096 C.M.R. ch. 115]

(12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:

A. Within thirty (30) days following receipt of the written test report by the Department, or another alternative timeframe approved by the Department, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's

normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 C.F.R. Part 60 or other method approved or required by the Department; and

B. The days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and

C. The licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.

[06-096 C.M.R. ch. 115]

(13) Notwithstanding any other provisions in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or license requirement. [06-096 C.M.R. ch. 115]

(14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emissions and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation. [06-096 C.M.R. ch. 115]

(15) Upon written request from the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such a manner as the Department shall prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status. [06-096 C.M.R. ch. 115]

(16) The licensee shall notify the Department within 48 hours and submit a report to the Department on a quarterly basis if a malfunction or breakdown in any component causes a violation of any emission standard (38 M.R.S. § 605). [06-096 C.M.R. ch. 115]

SPECIFIC CONDITIONS

(17) **Gas Processing, TO #1, and Flare #1**

A. Archaea shall combust all tail gas produced by the RNG process in TO #1. [06-096 C.M.R. ch. 115, BACT]

B. TO #1 shall maintain a minimum temperature of 1,300 °F during all operating times. [06-096 C.M.R. ch. 115, BACT]

C. Archaea shall continuously monitor the temperature inside TO #1 during all operating times. [06-096 C.M.R. ch. 115, BACT]

D. Operation of Flare #1 shall be limited to 243,000 MMBtu/year on a calendar year basis. [06-096 C.M.R. ch. 115, BACT]

E. Hydrogen Sulfide and Sulfur Dioxide Control [06-096 C.M.R. ch. 115, BACT]

1. Archaea shall operate carbon scrubbers to limit the concentration of H_2S in the tail gas combusted in TO #1 and Flare #1 to 25 ppmdv or less on a 12-month rolling average basis. This limit applies at all times.

2. Compliance with the H_2S ppmdv limit shall be demonstrated by sampling the concentration of the H_2S in the tail gas exiting the control equipment (i.e., the carbon scrubber outlet) at least once per calendar week using a handheld monitor or equivalent. Weekly measurements shall be used to develop a monthly average.

3. The handheld monitor or equivalent shall be operated, calibrated, and maintained in accordance with the manufacturer's specifications.

4. At least annually, Archaea shall test the gas exiting the carbon scrubbers three times during a single day using ASTM Test Method D5504, or other methods as approved by the Department, to analyze for H_2S and total sulfur.

5. Concurrent with the annual test, measurements of H_2S shall be taken with the handheld monitor or equivalent. If the results of the handheld (or equivalent) sampling do not correspond within reasonable accuracy to the annual test results, Archaea shall re-assess/replace/recalibrate the handheld monitor, or equivalent, as appropriate to obtain valid sampling results.

6. For the weekly and annual H_2S sampling required by this license, Archaea shall develop a written, site-specific monitoring plan that addresses methods and equipment used, data collection, and the quality assurance and quality control

elements. The monitoring plan shall be submitted to the Department for approval prior to startup of the RNG process.

F. Emissions shall not exceed the following:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
TO #1	PM	0.008	06-096 C.M.R. ch. 115, BACT
Flare #1	PM	0.02	06-096 C.M.R. ch. 115, BACT

G. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Emission Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
TO #1	0.09	0.09	0.41	1.70	2.40	0.70
Flare #1	1.63	1.63	0.81	6.61	30.13	0.32

H. Visible emissions from TO #1 shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

I. Visible emissions from Flare #1 shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

J. Archaea shall keep records for the following periodic monitoring for the RNG gas processing system:

1. H_2S concentration (ppmdv) exiting the carbon scrubbers on a monthly average and 12- month rolling average basis;
2. Records of H_2S and total sulfur concentrations from annual testing;
3. Amount of tail gas (scf) combusted in TO #1 on a monthly and calendar year basis;
4. Amount of process gas (scf) combusted in Flare #1 on a monthly and calendar year basis;
5. Records of all operating times for TO #1 and Flare #1;
6. Temperature inside TO #1 during all operating times;
7. Heat content (based on methane content) of the tail gas combusted in TO #1 and the process gas combusted in Flare #1 on a monthly and annual average basis;
8. Date, time, duration, and reason for any period of time when both carbon scrubbers are out of service; and
9. Records of any maintenance activities performed (planned or unplanned) on the carbon scrubbers, TO #1, and Flare #1.

[06-096 C.M.R. ch. 115, BACT and 06-096 C.M.R. ch. 137]

(18) **Gas Releases and Fugitive Emissions**

A. Annual emissions of VOC from gas releases and fugitive emissions combined shall not exceed 5.0 tpy. Whenever possible, planned venting events shall be vented to Flare #1. [06-096 C.M.R. ch. 115, BACT]

B. Archaea shall maintain a log of all gas releases and ESD events that include the following information:

1. Date of the event;
2. Estimated or actual event start time;
3. Estimated or actual event duration;
4. Event source;
5. Event type (shutdown, maintenance, testing, or malfunction);
6. Description of event; and
7. Estimate of the amount of natural gas/LFG vented.

[06-096 C.M.R. ch. 115, BACT]

C. Archaea shall notify the Department in advance of any scheduled venting event that is expected to result in the release of more than 85,000 scf of natural gas or LFG. Archaea shall notify the Department within two working days of any unscheduled venting event that results in the release of more than 85,000 scf of natural gas or LFG.
[06-096 C.M.R. ch. 115, BACT]

D. Archaea shall keep an updated inventory of equipment (e.g., valves, pump seals, connectors, flanges, etc.) and calculate fugitive emissions on a calendar year basis using emission factors obtained from EPA's *Protocol for Equipment Leak Emission Estimates*, EPA-453/R-95-017, Table 2-4, dated November 1995.
[06-096 C.M.R. ch. 115, BACT]

E. Emissions from gas releases and fugitive emissions (including VOC and methane) shall be reported to the Department annually as part of the facility's emissions inventory collected pursuant to *Emission Statements*, 06-096 C.M.R. ch. 137.
[06-096 C.M.R. ch. 137]

(19) **Generators #1 - #8**

A. Archaea shall only fire distillate fuel in Generators #1 - #8. The fuel sulfur content shall be limited to 0.0015% sulfur by weight. Compliance shall be demonstrated by fuel delivery receipts from the supplier, fuel supplier certification, certificate of analysis, or testing of the tank containing the fuel to be fired.
[06-096 C.M.R. ch. 115, BACT]

B. Emissions shall not exceed the following:

Unit	Pollutant	lb/MMBtu	Origin and Authority
Generators #1-8 (each)	PM	0.01	06-096 C.M.R. ch. 115, BACT & 40 C.F.R. Part 60, Subpart IIII

C. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT and 40 C.F.R. Part 60, Subpart IIII]:

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Generators #1 - #8 (each)	0.04	0.04	0.01	0.86	0.64	0.24

D. Visible emissions from each generator (Generators #1 - #8) shall not exceed 20% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

E. Generators #1 - #8 shall each meet the applicable requirements of 40 C.F.R. Part 60, Subpart IIII, including the following: [incorporated under 06-096 C.M.R. ch. 115, BACT and 06-096 C.M.R. ch. 169]

1. The engines shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in 40 C.F.R. § 60.4201(a). [40 C.F.R. §§ 60.4204(b) and 4211(c)]

2. The fuel fired in the engines shall not exceed 15 ppm sulfur (0.0015% sulfur). [40 C.F.R. § 60.4207(b)]

3. The engines shall be operated and maintained according to the manufacturer's emission-related written instructions. Archaea may only change those emission-related settings that are permitted by the manufacturer. [40 C.F.R. §§ 60.4211(a) and (c)]

4. Each engine's diesel particulate filter shall be installed with a backpressure monitor that notifies Archaea when the high backpressure limit of the engine is approached. [40 C.F.R. § 60.4209(b)]

5. Archaea shall keep records of any corrective action taken after the backpressure monitor has indicated that the high backpressure limit of the engine is approached. [40 C.F.R. § 60.4213(c)]

(20) **Compressors #1 - #2**

A. Archaea shall only fire natural gas in Compressors #1 - #2.
[06-096 C.M.R. ch. 115, BACT]

B. Compressors #1 - #2 shall each be equipped with a three-way catalyst for control of NO_x, CO, and VOC. [06-096 C.M.R. ch. 115, BACT]

C. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Compressors #1 - #2 (each)	0.02	0.02	0.01	0.45	0.90	0.31

D. Visible emissions from each compressor (Compressors #1 - #2) shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

E. Compressors #1 - #2 shall each meet the applicable requirements of 40 C.F.R. Part 60, Subpart JJJJ, including the following:
[incorporated under 06-096 C.M.R. ch. 115, BACT]

1. Compressors #1 - #2 are subject to emission standards for non-emergency spark ignition natural gas-fired engines between 100 – 500 Hp manufactured after January 1, 2011 contained in 40 C.F.R. Part 63, Subpart JJJJ, Table 1 pursuant to 40 C.F.R. § 63.4233(e).

2. Archaea shall maintain and operate the AFR controllers appropriately in order to ensure proper operation of the engine and control device to minimize emissions at all times. [40 C.F.R. § 60.4243(g)]

3. Within 60 days of achieving the maximum production rate, but not later than 180 days from initial startup, Archaea shall conduct an initial performance test on each engine to demonstrate compliance with the applicable NO_x, CO, and VOC emission standards in Table 1. [40 C.F.R. §§ 60.8(a) and 60.4243(b)(2)(i)]

4. Archaea shall provide 30-days' notice of any performance test to both the Department and EPA. [40 C.F.R. § 60.8(d)]

5. Performance tests shall be conducted in accordance with 40 C.F.R. § 60.4244 including, but not limited to, the following:

   a. Each performance test shall be conducted within 10% of 100% peak (or the highest achievable) load. [40 C.F.R. § 60.4244(a)]
   b. When calculating emissions of VOC, emissions of formaldehyde shall not be included. [40 C.F.R. § 60.4244(f)]

6. Archaea shall keep a maintenance plan and records of conducted maintenance. Archaea shall, to the extent practicable, maintain and operate each engine in a

manner consistent with good air pollution control practice for minimizing emissions. [40 C.F.R. § 60.4243(b)(2)(i)]

7. Archaea shall submit a copy of each performance test report to the Department and EPA within 30 days after the test has been completed. [40 C.F.R. § 60.4245(d) and 06-096 C.M.R. ch. 115]

8. Archaea shall keep records of the following for Compressors #1 - #2:

   a. All notifications submitted to comply with this subpart;
   b. All maintenance conducted on each engine;
   c. Documentation that each engine meets the emission standards (e.g., copies of performance test reports).

   [40 C.F.R. § 60.4245(a)]

(21) **Performance Test Protocol**

For any performance testing required by this license, Archaea shall submit to the Department for approval a performance test protocol, as outlined in the Department's Performance Testing Guidance, at least 30 days prior to the scheduled date of the performance test. [06-096 C.M.R. ch. 115, BPT]

(22) **Annual Emission Statements**

A. In accordance with *Emission Statements*, 06-096 C.M.R. ch. 137, Archaea shall annually report to the Department, in a format prescribed by the Department, the information necessary to accurately update the State's emission inventory. The emission statement shall be submitted as specified by the date in 06-096 C.M.R. ch. 137.

B. Archaea shall keep the following records in order to comply with 06-096 C.M.R. ch. 137:

   1. The amount of natural gas/propane and tail gas combusted in TO #1 on a monthly and calendar year basis;
   2. The amount of natural gas/propane and process gas combusted in Flare #1 on a monthly and calendar year basis;
   3. The sulfur content of the tail gas combusted in TO #1 and the process gas combusted in Flare #1;
   4. The amount of distillate fuel fired in each generator (Generators #1 - #8) on a monthly and calendar year basis;
   5. The sulfur content of the distillate fuel fired in the generators;
   6. The amount of natural gas fired in each compressor (Compressors #1 - #2) on a monthly and calendar year basis;

7. Calculations of the annual VOC, greenhouse gases (GHG), and HAP emissions from gas releases and fugitive emissions; and
8. Hours each emission unit was active or operating on a monthly and calendar year basis.

[06-096 C.M.R. ch. 137]

C. Beginning in reporting year 2023 and every third year thereafter, Archaea shall report to the Department emissions of hazardous air pollutants as required by 06-096 C.M.R. ch. 137, § (3)(C). Archaea shall pay the annual air quality surcharge, calculated by the Department based on these reported emissions of hazardous air pollutants, by the date required in Title 38 M.R.S. § 353-A(3).
[38 M.R.S. § 353-A(1-A)]

(23) If the Department determines that any parameter value pertaining to construction and operation of the proposed emissions units, including but not limited to stack size, configuration, flow rate, emission rates, nearby structures, etc., deviates from what was submitted in the application or ambient air quality impact analysis for this air emission license, Archaea may be required to submit additional information. Upon written request from the Department, Archaea shall provide information necessary to demonstrate AAQS will not be exceeded, potentially including submission of an ambient air quality impact analysis or an application to amend this air emission license to resolve any deficiencies and ensure compliance with AAQS. Submission of this information is due within 60 days of the Department's written request unless otherwise stated in the Department's letter.
[06-096 C.M.R. ch. 115, § 2(O)]

DONE AND DATED IN AUGUSTA, MAINE THIS 21st DAY OF OCTOBER, 2022.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:_____ for _____
MELANIE LOYZIM, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-1150-71-A-N.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 9/2/2022
Date of application acceptance: 9/7/2022

Date filed with the Board of Environmental Protection:

This Order prepared by Lynn Muzzey, Bureau of Air Quality.

FILED

OCT 21, 2022

State of Maine
Board of Environmental Protection