



DEPARTMENT ORDER

**AHJRLFLG LLC  
Penobscot County  
Old Town, Maine  
A-1150-71-A-N**

**Departmental  
Findings of Fact and Order  
Air Emission License  
New License**

**FINDINGS OF FACT**

After review of the air emission license 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**

AHJRLFLG LLC (Archaea) has applied for an Air Emission License for the operation of emission sources associated with their renewable natural gas processing facility.

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

**B. Emission Equipment**

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

**Fuel Burning Equipment**

<b>Equipment</b>	<b>Max. Input Capacity (MMBtu/hr)</b>	<b>Rated Output Capacity (kW)</b>	<b>Fuel Type</b>	<b>Firing Rate (scfh)</b>	<b>Date of Manuf.</b>
Thermal Oxidizer 1	4.74	N/A	Natural Gas	3,000 (startup) <300 (operating)	2020 or later
			Waste Gas	60,000	
Engine 1	16.43	1,750	Natural Gas	18,100	7/1/2010 or later
Engine 2	16.43	1,750	Natural Gas	18,100	7/1/2010 or later

Archaea may operate small stationary engines smaller than 0.5 MMBtu/hr. These engines are considered insignificant activities and are not required to be included in this license. However, they are still subject to applicable State and Federal regulations. More information regarding requirements for small stationary engines is available on the Department's website at the link below.

<http://www.maine.gov/dep/air/publications/docs/SmallRICEGuidance.pdf>

Additionally, Archaea may operate portable engines used for maintenance or emergency-only purposes. These engines are considered insignificant activities and are not required to be included in this license. However, they may still be subject to applicable State and Federal regulations.

### Process Equipment

Equipment	Production Rate
Gas Conversion Plant	2,000 scfm

Archaea may operate aqueous-based parts washers without amending their license. Parts washers using cleaning solutions containing less than 5% VOC do not meet the definition of solvent cleaning machine, and have no applicable requirements in *Solvent Cleaners*, 06-096 C.M.R. ch. 130. Aqueous-based parts washers are considered insignificant activities and mentioned for completeness purposes only.

#### C. Definitions

Portable Engine means an internal combustion engine which is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform. This definition does NOT include engines which remain or will remain at a location (excluding storage locations) for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period.

#### D. Stationary Source Definition

Archaea's plant will be located on the same property as the Juniper Ridge Landfill (JRL) which is owned by the State of Maine and operated by NEWSME Landfill Operations, LLC (NEWSME). NEWSME maintains an air emission license for JRL and its associated emission units.

JRL will supply Archaea with landfill gas (LFG) for Archaea to convert to natural gas suitable for injection into the existing natural gas distribution system. NEWSME will

continue to operate, maintain, and control the LFG collection activities which include a sulfur removal system and LFG flares. Any LFG not transferred to Archaea will continue to be controlled per NEWSME's existing air emission license. NEWSME will not be dependent on Archaea for compliance with their license conditions.

Archaea will receive LFG from JRL and process it to create a salable renewable natural gas product. Archaea is a separate and distinct legal entity under different ownership from JRL. Neither the State of Maine nor NEWSME have any cross-ownership interests with Archaea, and neither have control over the operation of Archaea's equipment, including air pollution control equipment.

Per State and Federal definitions, two or more emissions units are to be considered a single stationary source if they meet all three of the following criteria:

- They are in the same industrial grouping;
- They are located on contiguous or adjacent property; and
- They are under common control.

It may be argued that JRL and Archaea are in the same industrial grouping, and they are certainly on contiguous or adjacent property.

In April 2018 EPA issued clarification of its interpretation of "common control" in a letter to Pennsylvania DEP (the Meadowbrook letter<sup>1</sup>). The Meadowbrook letter explains EPA's view that control means the power or authority of one entity to dictate decisions of the other that could affect the applicability of, or compliance with, relevant air pollution regulatory requirements. In light of the Meadowbrook letter and based on the relationship between Archaea and JRL presented in the application and outlined above, the Department has determined that Archaea and JRL are not under common control and may be licensed as separate facilities.

#### E. 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.

A new source is considered a major source based on whether or not total licensed annual emissions exceed the "Significant Emission" levels as defined in the Department's *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100.

---

<sup>1</sup> [https://www.epa.gov/sites/production/files/2018-05/documents/meadowbrook\\_2018.pdf](https://www.epa.gov/sites/production/files/2018-05/documents/meadowbrook_2018.pdf)

Pollutant	Total Licensed Annual Emissions (TPY)	Significant Emission Levels
PM	3.2	100
PM <sub>10</sub>	3.2	100
SO <sub>2</sub>	0.3	100
NO <sub>x</sub>	29.3	100
CO	27.3	100
VOC	20.4	50

The Department has determined the facility is a minor source and the application has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 C.M.R. ch. 115.

F. Facility Classification

The facility is licensed as follows:

- As a natural minor source of air emissions, because no license restrictions are necessary to 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 2,000 scfm of LFG to a renewable natural gas 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.

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 the majority of the remaining TRS using either an adsorption system (e.g., SulfaTreat) or other treatment system (e.g., Thiopaq) that does not generate an air waste stream. The gas will then be chilled to remove moisture and compressed. The dehydrated gas will pass through a media-containing vessel to reduce VOCs and “polished” using an activated carbon filter. The gas is then pushed through a series of membranes that separate the methane, nitrogen, and oxygen from the carbon dioxide. The waste gas stream containing carbon dioxide, trace amounts of methane, and VOC will be combusted in a thermal oxidizer (Thermal Oxidizer 1).

A cryogenic process using liquid nitrogen will be used to separate the methane from the nitrogen and oxygen. The nitrogen and oxygen waste stream will be combined with the carbon dioxide waste stream to be combusted in Thermal Oxidizer 1.

At this point the gas produced will have reached pipeline quality and will be compressed and injected into the local gas distribution system. Any product gas that is not injected into the pipeline or used on-site will be returned to JRL for combustion in the facility’s flares.

To power the process, Archaea has proposed the installation of two generators each powered by a natural gas-fired reciprocating internal combustion engine (Engines 1 and 2).

### C. Gas-Processing and Waste Gases

Waste gases from the gas conversion process will contain carbon dioxide, nitrogen, and oxygen as well as small amounts of methane, VOC, hazardous air pollutants (HAP), and other contaminants.

#### 1. Best Available Control Technology (BACT)

Potential controls for VOC/HAP in the waste gas include catalytic oxidation and thermal oxidation. Both would destroy the VOC/HAP through oxidation to CO<sub>2</sub>.

The waste 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 (Thermal Oxidizer 1) to control VOC and HAP in the waste gas. Thermal Oxidizer 1 will use a natural gas flame to reach an assumed 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.

Thermal Oxidizer 1 will control up to 1,000 scfm of process waste gas with the addition of 2,000 scfm of dilution air used for oxygen addition and temperature control (3,000 scfm total). It is designed to operate between 1,000 to 1,800 °F with a normal operating temperature around 1,400 °F.

Thermal Oxidizer 1 will be equipped with a low-NO<sub>x</sub> burner rated at 0.06 lb/MMBtu. Thermal Oxidizer 1 will combust up to 3.0 MMBtu/hr of natural gas and up to 1.74 MMBtu/hr from the waste gases (4.74 MMBtu/hr total).

Combustion of the waste gas will convert any sulfur compounds to SO<sub>2</sub>. The maximum concentration of the TRS in the waste gas delivered to Thermal Oxidizer 1 is expected to be 2 ppm<sub>dv</sub>. Additional controls of SO<sub>2</sub> at this level is determined not to be economically feasible.

The BACT emission limits for Thermal Oxidizer 1 are based on the following:

- PM/PM<sub>10</sub> – 7.6 lb/MMscf based on AP-42 Table 1.4-2 dated 7/98
- SO<sub>2</sub> – 0.02 lb/hr based on an estimated H<sub>2</sub>S concentration of 2 ppm<sub>dv</sub>
- NO<sub>x</sub> – 0.06 lb/MMBtu per manufacturer data
- CO – 84 lb/MMscf based on AP-42 Table 1.4-1 dated 7/98
- VOC – 20 ppm<sub>dv</sub> per manufacturer data

The BACT emission limits for Thermal Oxidizer 1 are the following:

Unit	Pollutant	lb/MMBtu
Thermal Oxidizer 1	PM	0.007

Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Thermal Oxidizer 1	0.04	0.04	0.02	0.28	0.39	0.42

Compliance with the emission limits for Thermal Oxidizer 1 shall be demonstrated by use of standardized emission factors and annual recordkeeping of the amount of waste gas and natural gas fired.

Visible emissions from Thermal Oxidizer 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.

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. In which case, 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. 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.

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.

E. 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.<sup>2</sup>

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.

F. Engines 1 and 2

Due to the lack of reliable, stable power on-site, Archaea has proposed the installation of two (2) generator sets to power the facility. Each generator set will consist of a natural gas-fired engine (Engines 1 and 2) rated at 16.43 MMBtu/hr (approximately 2,418 Hp) and an electrical generator producing 1,750 kW of power.

Engines 1 and 2 are expected to be a Cummins model QSV91-G4 manufactured after July 1, 2010. They will fire only pipeline quality natural gas and will not fire raw LFG. Each engine will exhaust through its own stack which is at least 20 feet above ground level.

1. BACT Findings

Archaea submitted a BACT analysis for control of emissions from Engines 1 and 2.

a. Particulate Matter (PM, PM<sub>10</sub>) and Sulfur Dioxide (SO<sub>2</sub>)

Archaea has proposed to burn only gaseous fuel (natural gas) in the engines. Emissions of PM, PM<sub>10</sub>, and SO<sub>2</sub> from natural gas-fired engines are generally very low, and add-on pollution controls are not economically practical. Therefore, BACT for these pollutants is determined to be the emission limits listed in the table below and compliance with the requirements of *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*, 40 C.F.R. Part 60, Subpart JJJJ.

<sup>2</sup> <https://www3.epa.gov/ttnchie1/efdocs/equiplks.pdf>



b. Nitrogen Oxides (NO<sub>x</sub>)

Without add-on controls, the proposed engines are designed to meet an emission limit of 0.6 g/bhp-hr, lower than the limit of 1.0 g/bhp-hr in 40 C.F.R. Part 60, Subpart JJJJ for engines greater than 500 Hp manufactured after July 1, 2010.

Archaea considered the use of Selective Catalytic Reduction (SCR) for control of NO<sub>x</sub> emissions from Engines 1 and 2. The cost of control was estimated to be in excess of \$17,000 per ton of pollutant controlled. Therefore, SCR was determined to not be economically feasible for these units.

BACT for NO<sub>x</sub> is determined to be the emission limits listed in the table below and compliance with the requirements of *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*, 40 C.F.R. Part 60, Subpart JJJJ.

c. Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

Without add-on controls, the proposed engines can meet the emission limit for VOC (0.7 g/bhp-hr) but cannot meet the emission limit for CO (2.0 g/bhp-hr) in 40 C.F.R. Part 60, Subpart JJJJ for engines greater than 500 Hp manufactured after July 1, 2010.

Archaea considered the use of an oxidation catalyst for control of CO and VOC emissions. Oxidation catalysts are typically based on a noble metal and operate by decreasing the temperature at which oxidation of CO and VOC will occur. The catalyst lowers the activation energy necessary for CO to react with available oxygen in the exhaust to produce CO<sub>2</sub>. Use of an oxidation catalyst was found to be technically, economically, and environmentally feasible.

BACT for CO and VOC is determined to be use of an oxidation catalyst, the emission limits listed in the table below, and compliance with the requirements of *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*, 40 C.F.R. Part 60, Subpart JJJJ.

d. Emission Limits

The BACT emission limits for Engines 1 and 2 were based on the following:

PM/PM <sub>10</sub>	–	0.066 g/bhp-hr per manufacture data
SO <sub>2</sub>	–	5.88 x 10 <sup>-4</sup> lb/MMBtu based on AP-42, Section 3.2
NO <sub>x</sub>	–	0.60 g/bhp-hr per manufacture data
CO	–	0.55 g/bhp-hr per manufacturer data
VOC	–	0.17 g/bhp-hr (excluding formaldehyde) per manufacturer data 0.29 g/bhp-hr (including formaldehyde) per manufacturer data

The BACT emission limits for Engines 1 and 2 are the following:

Unit	Pollutant	lb/MMBtu
Engine 1	PM	0.02
Engine 2	PM	0.02

Unit	NO <sub>x</sub> (g/bhp-hr)	CO (g/bhp-hr)	VOC <sup>a</sup> (g/bhp-hr)
Engine 1	0.60	0.55	0.17
Engine 2	0.60	0.55	0.17

Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC <sup>b</sup> (lb/hr)
Engine 1	0.35	0.35	0.01	3.20	2.93	1.55
Engine 2	0.35	0.35	0.01	3.20	2.93	1.55

<sup>a</sup> The VOC emission limit in units of g/bhp-hr does not include formaldehyde.

<sup>b</sup> VOC emission limit in units of lb/hr includes formaldehyde.

## 2. Visible Emissions

Visible emissions from Engines 1 and 2 shall each not exceed 10% opacity on a six-minute block average basis except for periods of startup during which time Archaea may comply with the following work practice standards in lieu of the numerical visible emissions standard.

- a. Archaea shall maintain a log (written or electronic) of the date, time, and duration of all generator startups.
- b. The engines shall be operated in accordance with the manufacturer's emission-related operating instructions.
- c. Archaea shall minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations shall apply.
- d. The engines, including any associated air pollution control equipment, shall be operated at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.

3. New Source Performance Standards (NSPS)

Engines 1 and 2 are subject to *Standards of Performance for Spark Ignition Internal Combustion Engines (SI ICE)*, 40 C.F.R. Part 60, Subpart JJJJ. They are natural gas-fired non-emergency engines greater than 500 Hp manufactured after July 1, 2010. [40 C.F.R. § 60.4230(a)(4)(i) and Table 1]

a. Initial Notification

Within 30 days of commencement of construction (i.e, the date the engine is ordered), Archaea shall submit an initial notification to EPA and the Department which contains the following information for both Engines 1 and 2:

- (1) Name and address of the owner or operator;
- (2) The address of the affected source;
- (3) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
- (4) Emission control equipment; and
- (5) Fuel used.

[40 C.F.R. § 60.4245(c)]

b. Standards

Engines 1 and 2 are each subject to the following emission standards:

Unit	NO <sub>x</sub> (g/bhp-hr)	CO (g/bhp-hr)	VOC <sup>a</sup> (g/bhp-hr)	Origin
Engine 1	1.0	2.0	0.7	40 C.F.R.
Engine 2	1.0	2.0	0.7	§ 60.4233(e)

<sup>a</sup> This VOC emission standard does not include formaldehyde.

The Department has determined that the proposed BACT emission limits are more stringent than the applicable standards in 40 C.F.R. Part 63, Subpart JJJJ. Therefore, the emission limits for NO<sub>x</sub>, CO, and VOC for each engine has been streamlined to the more stringent BACT limit, and only these more stringent limits shall be included in this air emission license.

c. Compliance Demonstration

Engine manufacturers are not required to certify natural gas-fired, non-emergency engines greater than 500 Hp. Engines 1 and 2 are considered non-certified engines. Therefore, Archaea must demonstrate compliance with the emission standards for NO<sub>x</sub>, CO, and VOC through performance testing.

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 (Engines 1 and 2) to demonstrate compliance with the NO<sub>x</sub>, CO, and VOC emission limits. Archaea shall conduct subsequent performance tests every 8,760 hours or 3 years, whichever comes first. [40 C.F.R. §§ 60.8(a) and 4243(b)(ii)]

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. Recordkeeping

Archaea shall keep records of the following for Engines 1 and 2:

- (1) All notifications submitted to comply with this subpart;
- (2) All maintenance conducted on each engine;
- (3) Documentation that the engine meets the emission standards (e.g., copies of performance test reports).  
[40 C.F.R. § 60.4245(a)]
- (4) Hours of operation for each engine. [40 C.F.R. § 60.4243(b)(2)(ii)]

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. § 4245(d) and 06-096 C.M.R. ch. 115]

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

By meeting the requirements of 40 C.F.R. Part 60, Subpart JJJJ, Engines 1 and 2 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)]

G. Emissions Statement

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 and waste gas combusted in Thermal Oxidizer 1 on a monthly basis;
2. The amount of natural gas fired in Engines 1 and 2 (each) on a monthly basis;
3. The sulfur content of the waste gas combusted;
4. Calculations of the annual VOC, GHG, and HAP emissions from gas releases and fugitive emissions; and
5. Hours each emission unit was active or operating on a monthly basis.

Beginning in reporting year 2020 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)]

H. 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. The tons per year limits were calculated based on the following:

- Firing Thermal Oxidizer 1 and Engines 1 and 2 (each) at full capacity for 8,760 hr/year; and
- A VOC limit of 5.0 tpy for gas releases and fugitive emissions.

Please note, this information provides the basis for fee calculation only and should not be construed to 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 <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC
Thermal Oxidizer 1	0.2	0.2	0.1	1.3	1.7	1.8
Engine 1	1.5	1.5	0.1	14.0	12.8	6.8
Engine 2	1.5	1.5	0.1	14.0	12.8	6.8
Gas Releases & Fugitive Emissions	–	–	–	–	–	5.0
<b>Total TPY</b>	<b>3.2</b>	<b>3.2</b>	<b>0.3</b>	<b>29.3</b>	<b>27.3</b>	<b>20.4</b>

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 <sub>10</sub>	25
SO <sub>2</sub>	50
NO <sub>x</sub>	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.

## 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 A-1150-71-A-N subject to the following conditions.

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

### 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 and Waste Gas**

- A. Except as otherwise provided for in this license, Archaea shall combust all waste gas produced by the conversion process in Thermal Oxidizer 1.  
[06-096 C.M.R. ch. 115, BPT]
- B. Emissions shall not exceed the following:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
Thermal Oxidizer 1	PM	0.007	06-096 C.M.R. ch. 115, BACT

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

Emission Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Thermal Oxidizer 1	0.04	0.04	0.02	0.28	0.39	0.42

- D. Visible emissions from Thermal Oxidizer 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.  
[06-096 C.M.R. ch. 115, BACT]

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

- A. Annual emissions of VOC from gas releases and fugitive emissions combined shall not exceed 5.0 tpy. [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, BPT]

- 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, BPT]
- 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, BPT]
- 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 per *Emission Statements*, 06-096 C.M.R. ch. 137. [06-096 C.M.R. ch. 137]

(19) **Engines 1 and 2**

- A. Archaea is licensed to install two engines (Engines 1 and 2) with a maximum heat input not to exceed 16.5 MMBtu/hr (each). Engines 1 and 2 shall fire only pipeline quality natural gas. [06-096 C.M.R. ch. 115, BPT]
- B. Engines 1 and 2 shall each exhaust through its own stack which is at least 20 feet above ground level. [06-096 C.M.R. ch. 115, BPT]
- C. Archaea shall operate and maintain oxidation catalysts on Engines 1 and 2 (each).  
[06-096 C.M.R. ch. 115, BPT]
- D. Emissions shall not exceed the following:  
[06-096 C.M.R. ch. 115, BACT]

Unit	Pollutant	lb/MMBtu
Engine 1	PM	0.02
Engine 2	PM	0.02

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

Unit	NO <sub>x</sub> (g/bhp-hr)	CO (g/bhp-hr)	VOC <sup>a</sup> (g/bhp-hr)
Engine 1	0.60	0.55	0.17
Engine 2	0.60	0.55	0.17

<sup>a</sup> The VOC emission limit in units of g/bhp-hr does not include formaldehyde.

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

Unit	PM (lb/hr)	PM <sub>10</sub> (lb/hr)	SO <sub>2</sub> (lb/hr)	NO <sub>x</sub> (lb/hr)	CO (lb/hr)	VOC <sup>b</sup> (lb/hr)
Engine 1	0.35	0.35	0.01	3.20	2.93	1.55
Engine 2	0.35	0.35	0.01	3.20	2.93	1.55

<sup>b</sup> VOC emission limit in units of lb/hr includes formaldehyde.

G. Visible Emissions

Visible emissions from Engines 1 and 2 shall each not exceed 10% opacity on a six-minute block average basis except for periods of startup during which time Archaea may comply with the following work practice standards in lieu of the numerical visible emissions standard. [06-096 C.M.R. ch. 115, BACT]

1. Archaea shall maintain a log (written or electronic) of the date, time, and duration of all generator startups.
  2. Engines 1 and 2 shall be operated in accordance with the manufacturer's emission-related operating instructions.
  3. Archaea shall minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations shall apply.
  4. Engines 1 and 2, including any associated air pollution control equipment, shall be operated at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.
- H. Engines 1 and 2 shall 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, BPT]
1. Within 30 days of commencement of construction (i.e, the date the engine is ordered), Archaea shall submit an initial notification to EPA and the Department which contains the following information for both Engines 1 and 2:

- a. Name and address of the owner or operator;
  - b. The address of the affected source;
  - c. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
  - d. Emission control equipment; and
  - e. Fuel used.  
[40 C.F.R. § 60.4245(c)]
2. 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 (Engines 1 and 2) to demonstrate compliance with the NO<sub>x</sub>, CO, and VOC emission limits. Archaea shall conduct subsequent performance tests every 8,760 hours or 3 years, whichever comes first.  
[40 C.F.R. §§ 60.8(a) and 4243(b)(ii)]
  3. Archaea shall provide 30-days notice of any performance test to both the Department and EPA. [40 C.F.R. § 60.8(d)]
  4. 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)]
  5. Archaea shall keep records of the following for Engines 1 and 2:
    - a. All notifications submitted to comply with this subpart;
    - b. All maintenance conducted on each engine;
    - c. Documentation that the engine meets the emission standards (e.g., copies of performance test reports).  
[40 C.F.R. § 60.4245(a)]
    - d. Hours of operation for each engine. [40 C.F.R. § 60.4243(b)(2)(ii)]
  6. 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. § 4245(d) and 06-096 C.M.R. ch. 115]

(20) **Annual Emission Statement**

- 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 natural gas and waste gas combusted in Thermal Oxidizer 1 on a monthly basis;
  2. The amount of natural gas fired in Engines 1 and 2 (each) on a monthly basis;
  3. The sulfur content of the waste gas combusted;
  4. Calculations of the annual VOC, GHG, and HAP emissions from gas releases and fugitive emissions; and
  5. Hours each emission unit was active or operating on a monthly basis.  
[06-096 C.M.R. ch. 137]
- C. Beginning in reporting year 2020 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)]

DONE AND DATED IN AUGUSTA, MAINE THIS 24<sup>th</sup> DAY OF February, 2020.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:   
GERALD D. REID, COMMISSIONER

**The term of this license shall be ten (10) years from the signature date above.**

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 11/12/2019

Date of application acceptance: 12/2/2019

Date filed with the Board of Environmental Protection:

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

