



DEPARTMENT ORDER

**Pine Grove Crematorium  
Penobscot County  
Bangor, Maine  
A-949-71-D-A**

**Departmental  
Findings of Fact and Order  
Air Emission License  
Amendment #1**

**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 M.R.S. § 344 and § 590, the Maine Department of Environmental Protection (Department) finds the following facts:

**I. REGISTRATION**

A. Introduction

Pine Grove Crematorium (Pine Grove) was issued Air Emission License A-949-71-C-R/A on September 30, 2016, for the operation of two Class IV-A crematory incinerators.

Pine Grove has requested an amendment to their license to remove Cremator #1 from their license and replace it with a larger capacity unit, also to be named Cremator #1.

The equipment addressed in this license is located at 1347 Hammond Street, Bangor, Maine.

B. Emission Equipment

Pine Grove has removed the *old* Cremator #1 from the facility, and it is hereby removed from this air emission license. Pine Grove has requested to replace the *old* Cremator #1 with a *new*, larger volume unit, also named Cremator #1.

The *new* Cremator #1 is a B & L Systems Model Phoenix II-1 Human Crematory Incinerator with the following specifications:

<b>Class Incinerator</b>	IV-A
<b>No. of Chambers</b>	2
<b>Type of Waste</b>	Type 4
<b>Max. Design Combustion Rate (lb/hr)</b>	150 pounds per hour
<b>Auxiliary Fuel Input:</b>	Natural gas, LP* gas
<b>Primary Chamber (Btu/hr)</b>	500,000
<b>Secondary Chamber (Btu/hr)</b>	1,000,000
<b>Emission Control</b>	Afterburner

\*LP = liquefied petroleum

The crematory combustion gases from this unit vent to a 30 foot Above Ground Level (AGL) stack.

### C. Application Classification

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

The application for Pine Grove does not include the licensing of increased emissions but does include the installation of new or modified equipment. Therefore, this modification is determined to be a minor modification and has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 C.M.R. ch. 115. Based on the size and capacity of Cremators #1 and #2, Pine Grove is licensed below the major source threshold for criteria pollutants and is considered a natural minor. Based on the size and capacity of Cremators #1 and #2, Pine Grove is licensed below the major source thresholds for hazardous air pollutants (HAP) and is considered an area source of HAP.

## II. BEST PRACTICAL TREATMENT

### 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 06-096 C.M.R. ch. 100.

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. Cremator #1

Cremator #1 is a B & L Systems Model Phoenix II-1 Human Crematory Incinerator. This unit has a maximum initial charge of 1,000 pounds, with a maximum design combustion rate of 150 pounds per hour. Cremator #1 is capable of firing natural gas and LP gas in its auxiliary burners, which are rated at 0.5 MMBtu/hr for the primary chamber and 1.0 MMBtu/hr for the secondary chamber. Cremator #1 is equipped with an afterburner for pollution control, a temperature recorder for tracking operation of the unit, and an opacity detector to provide feedback to the operator.

BACT for Cremator #1 is the following:

1. Emission Limits

Emissions information is based on a licensed allowed particulate matter emission limit of 0.12 gr/dscf, corrected to 12% CO<sub>2</sub>, the burning of natural gas or LP gas as auxiliary fuels, and the use of the following emission factors:

The BACT emissions from the LP gas burner portion of the total exhaust were based on the following:

PM/PM <sub>10</sub>	0.2 lb/1000 gallons based on AP-42, Table 1.5-1, dated 7/08
SO <sub>2</sub>	0.018 lb/1000 gallons based on AP-42, Table 1.5-1, dated 7/08
NO <sub>x</sub>	13.0 lb/1000 gallons based on AP-42, Table 1.5-1, dated 7/08
CO	7.5 lb/1000 gallons based on AP-42, Table 1.5-1, dated 7/08
VOC	1.0 lb/1000 gallons based on AP-42, Table 1.5-1, dated 7/08

The BACT emissions from the natural gas burner portion of the total exhaust were based on the following:

PM/PM <sub>10</sub>	1.9 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
SO <sub>2</sub>	0.6 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
NO <sub>x</sub>	100 lb/MMscf based on AP-42, Table 1.4-1, dated 7/98
CO	84 lb/MMscf based on AP-42, Table 1.4-1, dated 7/98
VOC	5.5 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98

The BACT emissions from the biomedical portion of the total exhaust were based on the following:

PM	0.12 gr/dscf corrected to 12% CO <sub>2</sub> , based on 06-096 C.M.R. ch. 115, BACT
SO <sub>2</sub>	2.17 lb/ton based on AP-42, Table 2.3-1, dated 7/93
NO <sub>x</sub>	3.56 lb/ton based on AP-42, Table 2.3-1, dated 7/93
CO	2.95 lb/ton based on AP-42, Table 2.3-1, dated 7/93
VOC	0.299 lb/ton based on AP-42, Table 2.3-2, dated 7/93

The pound per hour BACT emissions for Cremator #1 are as follows:

	<b>PM (lb/hr)</b>	<b>PM<sub>10</sub> (lb/hr)</b>	<b>SO<sub>2</sub> (lb/hr)</b>	<b>NO<sub>x</sub> (lb/hr)</b>	<b>CO (lb/hr)</b>	<b>VOC (lb/hr)</b>
Auxiliary fuel	negl.	negl.	negl.	0.21	0.12	0.02
Remains	0.72	0.72	0.16	0.27	0.22	0.02
Total Emission Limit	0.72	0.72	0.16	0.48	0.34	0.04

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

## 2. Operating Parameters

- a. Operating temperature in the secondary chamber shall be maintained at or above 1600°F for the duration of the burn cycle, with a stack gas retention time, at or above 1600°F, of at least 1.0 second;
- b. To ensure an efficient burn, and to prevent odors and visible emissions, the secondary chamber shall be preheated, as specified by the manufacturer, until the pyrometer temperature measures at least 1600°F;
- c. No remains shall be introduced into the primary chamber until the temperature in the secondary chamber has reached 1600°F;
- d. Once the burn cycle has commenced by introduction of primary chamber combustion, Cremator #1 shall be operated in an efficient manner, and as specified by the manufacturer, for the period of time between preheat and reaching the set operational temperature to be a minimum of 1600°F in the secondary chamber;
- e. A pyrometer and 1/4 inch test port shall be installed and maintained at that location of the crematory or refractory lined stack which provides sufficient volume to insure a flue gas retention time of not less than 1.0 second at a minimum of 1600°F;
- f. A log shall be maintained recording the weight of the remains, preheat time, charging time and the temperature of the secondary chamber every 60 minutes after start-up until, and including, final shutdown time. For facilities operating a chart recorder, the start time, date, and weight charged shall be logged on the chart; and
- g. The crematory operator(s) shall receive adequate training to operate the crematory in accordance with the manufacturer's specifications and shall be familiar with the terms of the Air Emission License.

## C. Annual Emissions

This amendment will not change the facility's licensed annual emissions.

### **III. AIR QUALITY ANALYSIS**

According to 06-096 C.M.R. ch. 115, the level of air quality analysis and monitoring are determined on a case-by-case basis. Based on analysis for similar sources, the size of the source, the allowable emissions, the location, and the stack height, ambient air quality standards, including increments, are not expected to be violated. Therefore, an ambient air impact analysis will not be required for this source at this time.

### **ORDER**

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

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

The Department hereby grants Air Emission License Amendment A-949-71-D-A, subject to the following condition.

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License Amendment 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.

### **SPECIFIC CONDITIONS**

**The following Condition shall replace Condition (16) of Air Emission License A-949-71-C-R/A (issued September 30, 2016):**

**(16) Cremators #1 and #2**

- A. Cremators #1 and #2 shall be used for the disposal of human remains classified as type 4 waste and shall not be used for the disposal of plastics, cytotoxic (antineoplastic) drugs or any radioactive wastes and shall not be used to dispose of any medical waste classified as type 7 waste, as defined in 06-096 C.M.R. ch. 100. [06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]
- B. Cremators #1 and #2 shall not exceed the unit's maximum design combustion rates. Auxiliary fuel inputs to the primary and secondary chambers shall be LP gas and natural gas. Compliance shall be demonstrated through fuel receipts. [06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]

- C. Cremators #1 and #2 shall not exceed a particulate matter emission limit of 0.12 gr/dscf, corrected to 12% CO<sub>2</sub>. Licensed allowed emissions for the Cremators shall not exceed the following:

**Cremator Emission Limits  
(Pounds per Hour)**

	<b>Cremator #1 (lb/hr)</b>	<b>Cremator #2 (lb/hr)</b>
<b>PM</b>	0.72	0.72
<b>PM<sub>10</sub></b>	0.72	0.72
<b>SO<sub>2</sub></b>	0.16	0.16
<b>NO<sub>x</sub></b>	0.48	0.48
<b>CO</b>	0.34	0.34
<b>VOC</b>	0.04	0.04

Compliance shall be demonstrated through stack testing by request of the Department, in accordance with the appropriate method found in 40 C.F.R. Part 60, Appendix A. [06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]

- D. Visible emissions from each stack serving Cremators #1 and #2 shall not exceed 10% on a 6-minute block average basis. [06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]
- E. Operating temperature in the secondary chamber shall be maintained at or above 1600°F, with a stack gas retention time, at or above 1600°F, of at least 1.0 second. [06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]
- F. To insure an efficient burn, and to prevent odors and visible emissions, the secondary chamber shall be preheated, as specified by the manufacturer, until the pyrometer temperature measures at least 1600°F. [06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]
- G. No charge shall be introduced into the primary chamber until the temperature in the secondary chamber has reached 1600°F. [06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]

- H. Once the burn cycle has commenced by introduction of primary chamber combustion, the Cremators shall be operated in an efficient manner, and as specified by the manufacturer, for the period of time between preheat and reaching the set operational temperature to be a minimum of 1600<sup>0</sup>F in the secondary chamber. The temperature in the secondary chamber shall be maintained at a minimum of 1600<sup>0</sup>F for the duration of the burn cycle. [06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]
- I. A pyrometer and 1/4 inch test port shall be installed and maintained at that location of the crematory or refractory lined stack which provides sufficient volume to insure a flue gas retention time of not less than 1.0 second at a minimum of 1600<sup>0</sup>F. [06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]
- J. A log shall be maintained for each Cremator recording the initial weight of the charge, preheat time, charging time and the temperature of the secondary chamber every 60 minutes after start-up until, and including, final shutdown time. For facilities operating a chart recorder, the start time, date, and weight charged shall be logged on the chart. [06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]
- K. The crematory operator(s) shall receive adequate training to operate the crematory in accordance with the manufacturer's specifications and shall be familiar with the terms of the Air Emission License. [06-096 C.M.R. ch. 115, BPT & 06-096 C.M.R. ch. 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS 27 DAY OF October, 2017.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cane for  
PAUL MERCER, COMMISSIONER

**The term of this amendment shall be concurrent with the term of Air Emission License A-949-71-C-R/A.**

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 10/2/2017

Date of application acceptance: 10/3/2017

Date filed with the Board of Environmental Protection:

This Order prepared by Jonathan E. Rice, Bureau of Air Quality.

