



DEPARTMENT ORDER

**Bowdoin College  
Cumberland County  
Brunswick, Maine  
A-76-71-AH-A**

**Departmental  
Findings of Fact and Order  
Air Emission License  
Amendment #7**

**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

Bowdoin College (Bowdoin) was issued Air Emission License A-76-71-Z-R/A on August 14, 2015, for the operation of emission sources associated with their education facility. The license was subsequently amended on October 5, 2016 (A-76-71-AA-A), on June 8, 2018 (A-76-71-AB-M), on August 30, 2019 (A-76-71-AC-A), on May 29, 2020 (A-76-71-AE-A), on November 30, 2020 (A-76-71-AF-A), and on March 28, 2022 (A-76-71-AG-A).

Bowdoin has requested an amendment to their license in order to add an additional emergency generator at the Ladd House.

The equipment addressed in this license amendment is located on campus at 3800 College Station in Brunswick, Maine.

B. Emission Equipment

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

**Stationary Engine**

<b>Equipment</b>	<b>Max. Input Capacity (MMBtu/hr)</b>	<b>Rated Output Capacity (kW)</b>	<b>Fuel Type, % sulfur</b>	<b>Firing Rate (gal/hr)</b>	<b>Date of Manuf.</b>	<b>Date of Install.</b>
Ladd House Generator	3.1	300	distillate fuel, 0.0015%	22.2	2023	2023

C. Definitions

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:

<b>Pollutant</b>	<b>Current License (tpy)</b>	<b>Future License (tpy)</b>	<b>Net Change (tpy)</b>	<b>Significant Emission Levels</b>
PM	10.6	10.6	0.0	100
PM <sub>10</sub>	10.6	10.6	0.0	100
SO <sub>2</sub>	0.2	0.2	0.0	100
NO <sub>x</sub>	31.6	32.3	0.7	100
CO	12.7	12.8	0.1	100
VOC	1.4	1.4	0.0	50*

\* Bowdoin is located in an area of the state included in the Ozone Transport Region. Therefore, the significant emission level for VOC is 50 tpy.

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

E. Facility Classification

With the annual fuel limit on the boilers and the operating hours restriction on the emergency generators, the facility is licensed as follows:

- As a synthetic minor source of air emissions for NO<sub>x</sub>, because Bowdoin 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. Ladd House Generator

Bowdoin is installing a new emergency generator at the Ladd House. The emergency generator is a generator set consisting of an engine and an electrical generator. The emergency generator will have an engine rated at 3.1 MMBtu/hr which fires distillate fuel. The emergency generator will be manufactured in 2023.

#### 1. BACT Findings

The BACT emission limits for the Ladd House Generator are based on the following:

PM/PM <sub>10</sub>	- 0.12 lb/MMBtu from 06-096 C.M.R. ch. 103
SO <sub>2</sub>	- combustion of distillate fuel with a maximum sulfur content not to exceed 15 ppm (0.0015% sulfur by weight)
NO <sub>x</sub>	- 4.41 lb/MMBtu from AP-42, Table 3.3-1, dated 10/96
CO	- 0.95 lb/MMBtu from AP-42, Table 3.3-1, dated 10/96
VOC	- 0.35 lb/MMBtu from AP-42, Table 3.3-1, dated 10/96
Opacity	- 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for the Ladd House Generator are the following:

Unit	Pollutant	lb/MMBtu
Ladd House Generator	PM	0.12

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)
Ladd House Generator	0.36	0.36	0.01	13.41	2.89	1.06

Visible emissions from Ladd House Generator shall not exceed 20% opacity on a six-minute block average basis.

BACT for the Ladd House Generator includes recordkeeping of all maintenance conducted on the engine.

2. Chapter 169

*Stationary Generators*, 06-096 C.M.R. ch. 169 (Chapter 169), is applicable to the Ladd House Generator. It is an emergency generator 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.

For the Ladd House Generator, Bowdoin shall comply with the emission standards for emergency generators by complying with the applicable standards contained in 40 C.F.R. Part 60, Subpart III. [06-096 C.M.R. ch. 169, § 4(B)(1)]

3. New Source Performance Standards

*Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*, 40 C.F.R. Part 60, Subpart III is applicable to the emergency engine listed above since the unit was 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 III, the unit also meets 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)]

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

a. Emergency Engine Designation and Operating Criteria

Under 40 C.F.R. Part 60, Subpart III, a stationary reciprocating internal combustion engine (ICE) is considered an **emergency** stationary ICE (emergency engine) as long as the engine is operated in accordance with the following criteria. Operation of an engine outside of the criteria specified below may cause the engine to no longer be considered an emergency engine under 40 C.F.R. Part 60, Subpart III, resulting in the engine being subject to requirements applicable to **non-emergency** engines.

(1) Emergency Situation Operation (On-Site)

**There is no operating time limit on the use of an emergency engine to provide electrical power or mechanical work during an emergency situation.** Examples of use of an emergency engine during emergency situations include the following:

- Use of an engine to produce power for critical networks or equipment (including power supplied to portions of a facility) because of failure or interruption of electric power from the local utility (or the normal power source, if the facility runs on its own power production);
- Use of an engine to mitigate an on-site disaster;
- Use of an engine to pump water in the case of fire, flood, natural disaster, or severe weather conditions; and
- Similar instances.

(2) Non-Emergency Situation Operation

An emergency engine may be operated up to a maximum of 100 hours per calendar year for maintenance checks, readiness testing, and other non-emergency situations as described below.

- (i) An emergency engine may be operated for a maximum of 100 hours per calendar year for maintenance checks and readiness testing, provided that the tests are recommended by federal, state, or local government; the manufacturer; the vendor; the regional transmission organization or equivalent balancing authority and transmission operator; or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE more than 100 hours per calendar year.
- (ii) An emergency engine may be operated for up to 50 hours per calendar year for other non-emergency situations. **However, these operating hours are counted as part of the 100 hours per calendar year operating limit described in paragraph (2) and (2) (i) above.**

The 50 hours per calendar year operating limit for other non-emergency situations cannot be used for peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

[40 C.F.R. §§ 60.4211(f) and 60.4219]

b. 40 C.F.R. Part 60, Subpart IIII Requirements

(1) Manufacturer Certification Requirement

The engine shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in 40 C.F.R. § 60.4202. [40 C.F.R. § 60.4205(b)]

(2) Ultra-Low Sulfur Fuel Requirement

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

(3) Non-Resettable Hour Meter Requirement

A non-resettable hour meter shall be installed and operated on the engine. [40 C.F.R. § 60.4209(a)]

(4) Operation and Maintenance Requirements

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

(5) Annual Time Limit for Maintenance and Testing

As an emergency engine, the unit shall be limited to 100 hours/year for maintenance checks and readiness testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity). [40 C.F.R. § 60.4211(f)]

(6) Initial Notification Requirement

No initial notification is required under 40 C.F.R. Part 60, Subpart IIII for emergency engines. [40 C.F.R. § 60.4214(b)]

(7) Recordkeeping

Bowdoin shall keep records that include the hours of operation of the engine recorded through the non-resettable hour meter. Documentation shall include the number of hours the unit operated for emergency purposes, the number of hours the unit operated for non-emergency purposes, and the reason the engine was in operation during each time. [40 C.F.R. § 60.4214(b)]

C. 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:

- A combined total heat input limit of 206,000 MMBtu per year for the Central Heating Plant Units, based on a 12-month rolling total;
- A combined total heat input limit of 50,000 MMBtu per year for the non-Central Heating Plant licensed units, based on a 12-month rolling total;
- Operation of 100 hours per calendar year for each emergency generator; and
- Operation of 500 hours per calendar year for the Smith Union Generator.

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 <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC
Central Heating Plant Boilers	8.24	8.24	0.16	20.6	8.48	0.56
Non-Central Heating Plant Boilers	2	2	0.01	2.75	2.06	0.13
Bowdoin Mills Hall Generator	0.03	0.03	-	0.88	0.23	0.02
Bowdoin Warehouse Generator	0.02	0.02	-	0.67	0.14	0.05
Central Heating Plant Generator	0.04	0.04	-	0.61	0.13	0.05
Chamberlain Hall Generator	0.03	0.03	-	0.46	0.1	0.04
Druckenmiller Hall Generator	0.02	0.02	-	0.35	0.08	0.03
Farley Field House Generator	-	-	-	0.13	0.01	-
H & L Library Generator	-	-	-	0.16	0.01	-
Harpwell Apartments Generator	0.04	0.04	-	0.59	0.13	0.05
Kanbar Hall Generator	-	-	-	0.12	0.01	-
Ladd House Generator	0.02	0.02	0.00	0.67	0.14	0.05
Memorial Hall Generator	0.03	0.03	-	0.41	0.09	0.03
Moulton Union 1 Generator	-	-	-	0.36	0.03	0.01
Moulton Union 2 Generator	0.04	0.04	-	0.59	0.13	0.05
Park Row Generator	0.03	0.03	-	0.36	0.08	0.03
Rhodes Hall Generator	-	-	-	0.29	0.02	0.01
Roux Hall Generator	-	-	-	0.06	0.11	0.03
Smith Union Generator	0.04	0.04	-	0.25	0.51	0.18

	<b>PM</b>	<b>PM<sub>10</sub></b>	<b>SO<sub>2</sub></b>	<b>NO<sub>x</sub></b>	<b>CO</b>	<b>VOC</b>
Stowe Hall Generator	-	-	-	0.19	0.02	0.01
Thorne Dining Generator	0.02	0.02	-	0.9	0.19	0.07
Walker Art Museum Generator	-	-	-	0.36	0.03	0.01
Watson Ice Arena Generator	0.02	0.02	-	0.35	0.08	0.03
Wellness Center Generator	-	-	-	0.16	0.01	-
<b>Total TPY</b>	<b>10.6</b>	<b>10.6</b>	<b>0.2</b>	<b>32.3</b>	<b>12.8</b>	<b>1.4</b>

<b>Pollutant</b>	<b>Tons/year</b>
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:

<b>Pollutant</b>	<b>Tons/Year</b>
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 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 Bowdoin 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-76-71-AH-A subject to the conditions found in Air Emission License A-76-71-Z-R/A, in amendments A-76-71-AA-A, A-76-71-AB-M, A-76-71-AC-A, A-76-71-AE-A, A-76-71-AF-A, and A-76-71-AG-A, 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.

**SPECIFIC CONDITIONS**

**The following shall replace Specific Condition (19)(A), (B), and (E) of Air Emission License Amendment A-76-71-AG-A.**

**(19) Emergency Generators**

A. Emissions shall not exceed the following:

<b>Unit</b>	<b>Pollutant</b>	<b>lb/MMBtu</b>	<b>Origin and Authority</b>
Thorn Dining Generator	PM	0.12	06-096 C.M.R. ch. 103, § (2)(B)(1)(a)
Bowdoin Warehouse	PM	0.12	06-096 C.M.R. ch. 103, § (2)(B)(1)(a)
Bowdoin Mills Hall Generator	PM	0.12	06-096 C.M.R. ch. 103, § (2)(B)(1)(a)
Ladd House Generator	PM	0.12	06-096 C.M.R. ch. 103, § (2)(B)(1)(a)

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

<b>Unit</b>	<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>
Bowdoin Warehouse Gen. (3.04 MMBtu/hr, distillate fuel)	0.36	0.36	0.005	13.41	2.89	1.09
Bowdoin Mills Hall Gen. (5.50 MMBtu/hr, distillate fuel)	0.66	0.66	0.01	17.50	4.65	0.49
Central Heating Plant Gen. (2.70 MMBtu/hr, distillate fuel)	0.83	0.83	0.01	11.82	2.55	0.96
Chamberlain Hall Gen. (2.10 MMBtu/hr, distillate fuel)	0.64	0.64	0.01	9.06	1.95	0.74
Druckenmiller Hall Gen. (1.50 MMBtu/hr, distillate fuel)	0.48	0.48	0.01	6.83	1.47	0.56
Farley Field House Gen. (0.60 MMBtu/hr, natural gas)	0.01	0.01	--	2.53	0.20	0.07
Harpwell Apartments Gen. (2.69 MMBtu/hr, distillate fuel)	0.83	0.83	--	11.86	2.56	0.97
H & L Library Gen. (0.80 MMBtu/hr, natural gas)	0.01	0.01	--	3.28	0.26	0.09
Kanbar Hall Gen. (0.60 MMBtu/hr, natural gas)	0.01	0.01	--	2.42	0.19	0.07
Ladd House Generator (3.1 MMBtu/hr distillate fuel)	0.36	0.36	0.01	13.41	2.89	1.06
Memorial Hall Gen. (1.80 MMBtu/hr, distillate fuel)	0.56	0.56	0.01	7.98	1.72	0.65
Moulton Union Gen. 1 (1.80 MMBtu/hr, natural gas)	0.02	0.02	--	7.31	0.57	0.21
Moulton Union Gen. 2 (outside) (2.60 MMBtu/hr, distillate fuel)	0.81	0.81	0.01	11.54	2.49	0.94
Park Row Gen. (1.63 MMBtu/hr, distillate fuel)	0.51	0.51	--	7.19	1.55	0.59
Rhodes Hall Gen. (1.40 MMBtu/hr, natural gas)	0.01	0.01	--	5.71	0.44	0.17
Roux Hall Gen. (1.80 MMBtu/hr, natural gas)	0.09	0.09	--	1.11	2.22	0.55
Smith Union Generator (3.50 MMBtu/hr, natural gas)	0.17	0.17	--	1.01	2.03	0.71
Stowe Hall Gen. (0.90 MMBtu/hr, natural gas)	0.01	0.01	--	3.86	0.30	0.11
Thorne Dining Gen. (4.00 MMBtu/hr, distillate fuel)	0.48	0.48	0.01	17.58	3.79	1.44
Walker Art Museum Gen. (1.80 MMBtu/hr, natural gas)	0.02	0.02	--	7.31	0.57	0.21
Watson Ice Arena Gen. (1.60 MMBtu/hr, distillate fuel)	0.48	0.48	0.01	6.89	1.48	0.56
Wellness Center Gen. (0.80 MMBtu/hr, natural gas)	0.01	0.01	--	3.32	0.26	0.10

- E. The Bowdoin Warehouse, Central Heating Plant, Harpswell Apartments, Moulton Union 2, Park Row, Watson Ice Arena, Bowdoin Mills Hall, and Ladd House Generators shall 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]
1. **Manufacturer Certification**  
The engines shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in § 60.4202. [40 C.F.R. § 60.4205(b)]
  2. **Ultra-Low Sulfur Fuel**  
The fuel fired in the engines shall not exceed 15 ppm sulfur (0.0015% sulfur). Compliance with the sulfur content limit 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. [40 C.F.R. § 60.4207(b) and 06-096 C.M.R. ch. 115, BPT]
  3. **Non-Resettable Hour Meter**  
A non-resettable hour meter shall be installed and operated on each engine. [40 C.F.R. § 60.4209(a)]
  4. **Annual Time Limit for Maintenance and Testing**
    - a. As emergency engines, the units shall each be limited to 100 hours/year for maintenance checks and readiness testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity). These limits are based on a calendar year. Compliance shall be demonstrated by records (electronic or written log) of all engine operating hours. [40 C.F.R. § 60.4211(f) and 06-096 C.M.R. ch. 115, BPT]
    - b. Bowdoin shall keep records that include maintenance conducted on each engine and the hours of operation of each engine recorded through the non-resettable hour meter. Documentation shall include the number of hours each unit operated for emergency purposes, the number of hours each unit operated for non-emergency purposes, and the reason each engine was in operation during each time. [40 C.F.R. § 60.4214(b)]

5. Operation and Maintenance

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

**The following is a new Specific Condition of Air Emission License A-76-71-Z-R/A.**

- (20) 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, Bowdoin may be required to submit additional information. Upon written request from the Department, Bowdoin 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 14<sup>th</sup> DAY OF DECEMBER, 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-76-71-Z-R/A.**

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 10/28/2022

Date of application acceptance: 11/14/2022

Date filed with the Board of Environmental Protection:

This Order prepared by Chris Ham, Bureau of Air Quality.

