



DEPARTMENT ORDER

University of Maine System
University of Maine at Fort Kent
Aroostook County
Fort Kent, Maine
A-604-71-K-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 Maine Revised Statutes (M.R.S.) § 344 and § 590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. **REGISTRATION**

A. Introduction

The University of Maine at Fort Kent (UMFK) was issued Air Emission License A-604-71-J-R/M on 8/13/18, for the operation of emission sources associated with their campus facilities.

UMFK has requested an amendment to their license in order to install four new 2.0 MMBtu/hr propane boilers.

The equipment addressed in this license amendment is located on University Drive, Fort Kent, Maine.

B. Emission Equipment

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

Boilers

Equipment	Max. Capacity (MMBtu/hr)	Maximum Firing Rate (gal/hr)	Fuel Type, % sulfur	Date of Manuf.	Date of Install.	Stack #
LPG #1	2.0	21.9	propane, neg.	2020	2020	LPG1
LPG #2	2.0	21.9	propane, neg.	2020	2020	
LPG #3	2.0	21.9	propane, neg.	2020	2020	LPG2
LPG #4	2.0	21.9	propane, neg.	2020	2020	

C. 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	11.4	13.2	1.8	100
PM ₁₀	11.4	13.2	1.8	100
SO ₂	18.1	18.1	0	100
NO _x	17.3	22.3	5.0	100
CO	15.7	18.6	2.9	100
VOC	0.6	1.0	0.4	50

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

D. Facility Classification

With the annual fuel limit on the oil fired and wood fired boilers, and the operating hours restriction on the emergency generator, the facility is licensed as follows:

- As a synthetic minor source of air emissions, because UMFK 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 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. LPG Boilers #1, #2, #3, and #4

UMFK will operate boilers LPG #1, #2, #3, and #4 for heat to supplement the existing wood fired boilers when demand is low. The boilers are rated at 2.0 MMBtu/hr each and fire propane. The boilers will be installed in 2020. Boilers LPG #1 and LPG #2 will exhaust through a single stack (LPG1), and boilers LPG #3 and LPG #4 will exhaust through a single stack (LPG2), each stack with a height of 35 feet above ground level (AGL).

1. BACT Findings

Summarized below is the Department's BACT determination based on the BACT analysis submitted by UMFK for emissions from boilers LPG #1, #2, #3, and #4.

a. Particulate Matter (PM, PM₁₀)

UMFK has proposed to burn only low-ash content fuel (propane) in the boilers. Additional add-on pollution controls may be technically feasible, but they are not economically feasible.

BACT for PM/PM₁₀ emissions from boilers LPG #1, #2, #3, and #4 is the combustion of propane exclusively and the emission limits listed in the tables below.

b. Sulfur Dioxide (SO₂)

UMFK has proposed to fire only propane. Because of propane's inherently low sulfur content, the use of this fuel results in minimal emissions of SO₂. Although they may be technically feasible, additional add-on pollution controls are not economically feasible.

BACT for SO₂ emissions from boilers LPG #1, #2, #3, and #4 is the use of propane and the emission limits listed in the tables below.

c. Nitrogen Oxides (NO_x)

UMFK considered several control strategies for the control of NO_x including Selective Catalytic Reduction (SCR), Selective Non-Catalytic Reduction (SNCR), and flue gas recirculation (FGR).

Both SCR and SNCR are technically feasible control technologies for minimizing NO_x. However, they have a negative environmental impact of emissions of unreacted ammonia. In addition, due to the initial capital cost and the annual

operating costs, these systems are typically only considered cost effective for units larger than boilers LPG #1, #2, #3, and #4.

FGR is not available on boilers of this size.

BACT for NO_x emissions from boilers LPG #1, #2, #3, and #4 is the use of good combustion practices and the emission limits listed in the tables below.

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

UMFK considered several control strategies for the control of CO and VOC including oxidation catalysts, thermal oxidizers, and use of an oxygen trim system.

Although technically feasible, oxidation catalysts and thermal oxidizers both have high capital, maintenance, and operational costs considering the size of the boilers in question. These controls were determined to not be economically feasible.

BACT for CO and VOC emissions from boilers LPG #1, #2, #3, and #4 is the use of good combustion practices and the emission limits listed in the tables below.

e. Emission Limits

The BACT emission limits for boilers LPG #1, #2, #3, and #4 were based on the following:

Propane

- PM/PM₁₀ – 0.05 lb/MMBtu based on 06-096 C.M.R. ch. 115, BACT
- SO₂ – 0.054 lb/1000 gal based on AP-42 Table 1.5-1 dated 7/08
- NO_x – 13 lb/1000 gal based on AP-42 Table 1.5-1 dated 7/08
- CO – 7.5 lb/1000 gal based on AP-42 Table 1.5-1 dated 7/08
- VOC – 1 lb/1000 gal based on AP-42 Table 1.5-1 dated 7/08
- Visible Emissions – 06-096 C.M.R. ch. 115, BACT

The BACT emission limits for boilers LPG #1, #2, #3, and #4 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)
LPG #1	0.10	0.10	Neg	0.28	0.16	0.02
LPG #2	0.10	0.10	Neg	0.28	0.16	0.02
LPG #3	0.10	0.10	Neg	0.28	0.16	0.02
LPG #4	0.10	0.10	Neg	0.28	0.16	0.02

2. Visible Emissions

Visible emissions from each stack exhausting boilers LPG #1, #2, #3, and #4 shall not exceed 10% opacity on a six-minute block average basis.

3. New Source Performance Standards (NSPS): 40 C.F.R. Part 60, Subpart Dc

Due to their size, boilers LPG #1, #2, #3, and #4 are not subject to *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units* 40 C.F.R. Part 60, Subpart Dc for units greater than 10 MMBtu/hr manufactured after June 9, 1989. [40 C.F.R. § 60.40c]

4. National Emission Standards for Hazardous Air Pollutants (NESHAP): 40 C.F.R. Part 63, Subpart JJJJJ

Because boilers LPG #1, #2, #3, and #4 combust exclusively propane, they are not subject to the *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*, 40 C.F.R. Part 63, Subpart JJJJJ [40 C.F.R. § 63.11195]

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. Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included. Maximum potential emissions were calculated based on the following assumptions:

- Firing 500,000 gal/yr distillate fuel in the Oil Boilers;
- Firing 3,000 tons/yr/ of wood pellets at 12% moisture in the Wood Boilers;
- Operating Generator #2 for 100 hrs/yr; and
- Operating boilers LPG #1, #2, #3, and #4 for 8,760 hr/yr each.

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 ₁₀	SO ₂	NO _x	CO	VOC
Oil Boilers	4.20	4.20	17.50	5.0	1.25	0.09
Wood Boilers	7.13	7.13	0.59	11.64	14.26	0.40
Generator #2	0.02	0.02	--	0.66	0.14	0.05
LPG #1, #2, #3, and #4	1.8	1.8	--	5.0	2.9	0.4
Total TPY	13.2	13.2	18.1	22.3	18.6	1.0

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.

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-604-71-K-A subject to the conditions found in Air Emission License A-604-71-J-R/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.

SPECIFIC CONDITIONS

The following is a new condition of Air Emission License A-604-71-J-R/M.

(21) **LPG #1, #2, #3, and #4**

A. Fuel

Boilers LPG #1, #2, #3, and #4 are licensed to fire only propane.
[06-096 C.M.R. ch. 115, BACT]

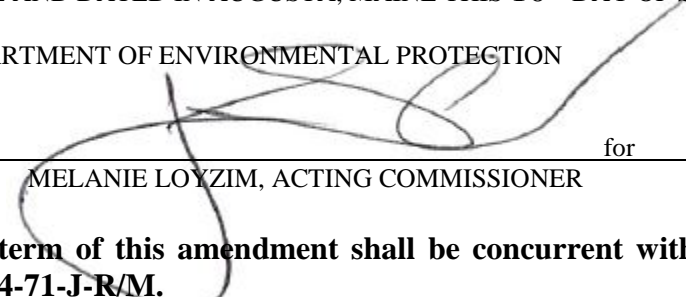
B. Emissions shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Emission Unit	PM (lb/hr)	PM₁₀ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
LPG #1	0.10	0.10	0.28	0.16	0.02
LPG #2	0.10	0.10	0.28	0.16	0.02
LPG #3	0.10	0.10	0.28	0.16	0.02
LPG #4	0.10	0.10	0.28	0.16	0.02

- C. Visible emissions from each stack exhausting boilers LPG #1, #2, #3, and #4 shall not exceed 10% opacity on a six-minute block average basis. [06-096 C.M.R. ch. 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS 10th DAY OF SEPTEMBER, 2020.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:  for
MELANIE LOYZIM, ACTING COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-604-71-J-R/M.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 7/29/20

Date of application acceptance: 8/3/20

Date filed with the Board of Environmental Protection:

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

