



DEPARTMENT ORDER

**Stratton Lumber, Inc.
Franklin County
Stratton, Maine
A-9-71-P-A (SM)**

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

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

I. REGISTRATION

A. Introduction

Stratton Lumber, Inc. (Stratton) was issued Air Emission License A-9-71-O-R on March 24, 2014, for the operation of emission sources associated with their lumber mill.

Stratton has requested an amendment to their license in order to install a 8.42 MMBtu/hour (200 HP) liquefied petroleum gas (LPG) fired boiler to supplement steam generation from Stratton's existing biomass boiler.

In order to remain a synthetic minor source, Stratton is proposing to limit the annual heat input of their existing biomass boiler, designated Boiler #1, to 90% of its annual maximum heat capacity. Therefore, as part of this amendment, the previous maximum capacity of 197,100 MMBtu/year for Boiler #1 shall be limited to 177,390 MMBtu/year.

The equipment addressed in this license amendment is located at 66 Fontaine Road in Stratton, Maine.

B. Emission Equipment

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

Boilers

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate (gal/hour)	Fuel Type, % sulfur	Installation Date	Stack #
Boiler #2	8.42	92.0	LPG, negligible	2016	Boiler Stack #2

C. Application Classification

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 (CMR) 100 (as amended). 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 (TPY)
PM	29.6	27.0	-2.6	100
PM ₁₀	29.6	27.0	-2.6	100
SO ₂	2.0	1.8	-0.2	100
NO _x	21.7	22.5	0.8	100
CO	98.6	99.8	1.2	100
VOC	49.2	48.9	-0.3	50
CO _{2e}	<100,000	<100,000	0.0	100,000

The application for Stratton for the addition of a 8.42 MMBtu/hour LPG-fired boiler is considered to be a minor modification. Therefore, this application has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 CMR 115 (as amended).

With the annual heat input limit of 177,390 MMBtu/year on Boiler #1 and the firing of LPG in Boiler #2, Stratton is licensed below the major source thresholds and is therefore considered a synthetic minor. Given the limits above, Stratton is also licensed below the major source thresholds for hazardous air pollutants (HAP) and is considered an area source of 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 CMR 100 (as amended). 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 CMR 100 (as amended). BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

B. Boiler #2

Stratton is proposing to install and operate a 8.42 MMBtu/hour LPG-fired boiler, designated Boiler #2, to supplement its steam-production for building heat and their drying kilns. Boiler #2 is manufactured by the Hurst Boiler & Welding Company, is equipped with a burner manufactured by the S.T. Johnson Company and fires LPG fuel at a rate of 92.0 gallons/hour.

Emissions from Boiler #2 will exhaust to Boiler Stack #2 which has height of 25 feet above ground level and an inside diameter of 16 inches.

1. BACT Findings

Best Available Control Technology (BACT) for Boiler #2 is summarized below:

a. Particulate Matter (PM), Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)

Emissions of PM, CO, and VOC from new LPG-fired boilers are generally very low, therefore, add-on emission control equipment is not economically feasible. Stratton will meet BACT for these pollutants through the use of efficient burner combustion technology.

The Department finds that good combustion control for Boiler #2 is considered BACT for controlling PM, CO, and VOC emissions.

b. Sulfur Dioxide (SO₂)

When firing LPG, the sulfur dioxide emissions from Boiler #2 will be negligible because the sulfur content in LPG is very low.

The Department finds that firing LPG exclusively in Boiler #2 is considered BACT for controlling SO₂ emissions.

c. Nitrogen Oxides

NO_x Control Technologies

NO_x control techniques are generally organized in two separate groups: combustion controls and post-combustion controls. Combustion controls affect the combustion conditions to minimize the formation of NO_x, while post-combustion controls remove NO_x after it has formed. The combustion of LPG in an industrial boiler produces NO_x primarily due to the reaction of oxygen and nitrogen present in combustion air, producing what is known as “thermal NO_x”.

LPG contains very little fuel bound nitrogen, therefore the oxidation of fuel nitrogen to form "fuel NO_x" is negligible.

Post-Combustion Control Techniques

Two post-combustion control techniques such as Selective Catalytic Reduction (SCR) and Selective Non-catalytic Reduction (SNCR) have been employed on boilers. Most fire-tube package boilers lack the furnace space and residence time necessary for effective SNCR operation, and therefore SNCR is not technically feasible for the proposed boiler. SCR has been used on gas-fired package fire tube boilers only on a very limited basis, primarily in the state of California, to meet Lowest Achievable Emission Rate (LAER) requirements. Since the potential annual NO_x emissions from Boiler #2 are approximately 3 tons per year, the resulting cost-effectiveness value for SCR would be well above what is currently considered economically feasible for a minor source BACT determination in Maine.

Combustion Controls

Combustion control techniques have been demonstrated as successfully achieving NO_x reductions in boilers in a cost-effective manner. The combustion control methods available to control thermal NO_x on industrial boilers consist of low NO_x burners and flue gas recirculation (FGR).

Low NO_x Burners

The term "low NO_x burner" generally refers to a set of burner components (e.g. burner register, atomizing nozzle, diffuser) that are designed to achieve lower NO_x by mixing the fuel and combustion air in a way that limits NO_x formation. This is generally done by mixing combustion air and fuel in multiple stages, and by utilizing a specially designed nozzle and/or diffuser to achieve a particular flame pattern.

Boiler #2 is designed to be based upon the use of a Johnson FD68-LN burner which is regarded as generating low emissions and incorporates FGR.

Flue Gas Recirculation

With FGR, a portion of the combustion gases are recirculated back into the combustion zone. The relatively cool flue gas absorbs heat released by the burner flame, thereby lowering peak flame temperatures and thermal NO_x formation. The Johnson FD68-LN burner will rely on induced FGR technology to achieve low NO_x emissions. With induced FGR, a portion of the combustion gas flowing out of the final pass of the boiler mixes with the combustion air supply and is delivered to the burner.

Stratton is proposing to use a Hurst integrated boiler and Johnson FD68-LN burner package equipped with FGR for achieving substantial NO_x reductions. When firing LPG, the NO_x emission performance of the boiler equipped with a low emissions burner is at or below 0.08 lb/MMBtu.

The Department finds that the use of the Hurst boiler and Johnson FD68-LN burner is considered to be BACT. The NO_x emission limits proposed for Boiler #2 are as stringent as similar units permitted in Maine.

The BACT emission limits for Boiler #2 firing LPG were based on the following:

PM/PM ₁₀	0.01 lb/MMBtu, based on vendor data
SO ₂	0.054 lb/1000 gallons, based on AP-42, Table 1.5-1, dated 7/08
NO _x	0.08 lb/MMBtu, based on vendor data
CO	0.30 lb/MMBtu, based on vendor data
VOC	0.02 lb/MMBtu, based on vendor data
Opacity	06-096 CMR 101

The BACT emission limits for Boiler #2 are the following:

Equipment	Pollutant	lb/MMBtu
Boiler #2	PM	0.01

Emissions from the Boiler #2 shall not exceed the following:

Equipment	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler #2	0.08	0.08	0.01	0.67	2.53	0.17

Visible emissions from Boiler Stack #2, servicing Boiler #2, shall not exceed 10% opacity on a six-minute block average basis.

2. New Source Performance Standards (NSPS): 40 CFR Part 60, Subpart Dc

Due to its maximum capacity being less than 10 MMBtu/hour, Boiler #2 is not subject to the New Source Performance Standards (NSPS) 40 CFR Part 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, for units greater than 10 MMBtu/hr manufactured after June 9, 1989. [40 CFR §60.40c]

3. National Emission Standards for Hazardous Air Pollutants (NESHAP): 40 CFR Part 63, Subpart JJJJJ

Boiler #2 is exclusively fired by gas (LPG), as defined in 40 CFR §63.11237, and is located at an area source of HAP, as defined in §63.2. As such, Boiler #2 is not subject to the *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*, 40 CFR Part 63, Subpart JJJJJ. [40 CFR § 63.11195 (e)]

C. Annual Emissions

1. Total Annual Emissions

Stratton shall be restricted to the following annual emissions, on a twelve-month rolling-total basis:

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

Equipment	PM	PM ₁₀	SO ₂	NO _x	CO	VOC
Boiler #1 - Biomass	26.6	26.6	1.8	19.5	88.7	8.9
Boiler #2 - LPG	0.4	0.4	0.1	3.0	11.1	0.8
Drying Kilns	-	-	-	-	-	39.3
Total TPY	27.0	27.0	1.9	22.5	99.8	49.0

The tons per year limits were calculated based on a maximum annual heat input of 177,390 MMBtu/year for Boiler #1, 8,760 hours of operation for Boiler #2 and a maximum licensed throughput of 90 MMBF/year for the Drying Kilns (with 25 MMBF/year of the total 90 MMBF/year throughput being designated for fir species).

2. Greenhouse Gases

Greenhouse gases are considered regulated pollutants as of January 2, 2011, through 'Tailoring' revisions made to EPA's *Approval and Promulgation of Implementation Plans*, 40 CFR Part 52, Subpart A, §52.21, *Prevention of Significant Deterioration of Air Quality* rule. Greenhouse gases, as defined in 06-096 CMR 100 (as amended), are the aggregate group of the following gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. For licensing purposes, greenhouse gases (GHG) are calculated and reported as carbon dioxide equivalents (CO₂e).

The quantity of CO₂e emissions from this facility is less than 100,000 tons per year, based on the following:

- the types of fuel being fired;
- the facility's fuel use limit;
- worst case emission factors from the following sources: U.S. EPA's AP-42, the Intergovernmental Panel on Climate Change (IPCC), and 40 CFR Part 98, *Mandatory Greenhouse Gas Reporting*; and
- global warming potentials contained in 40 CFR Part 98.

No additional licensing actions to address GHG emissions are required at this time.

III. AMBIENT AIR QUALITY ANALYSIS

Stratton previously submitted an ambient air quality impact analysis for air emission license A-9-71-G-A/R (dated September 8, 1997) demonstrating that emissions from the facility, in conjunction with all other sources, do not violate National Ambient Air Quality Standards (NAAQS).

Since the emissions from the installation of Boiler #2 are relatively small and are not likely to cause or contribute to a violation of a NAAQS, an updated air quality impact analysis is not required as part of this 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 A-9-71-P-A subject to the conditions found in Air Emission License A-9-71-O-R, and in 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

This condition shall replace Condition (16)A in Air Emission License A-9-71-O-R:

(16) Boiler #1

A. Fuel

1. Boiler #1 is licensed to fire wood and shall be operated so as not to exceed an operating capacity of 22.5 MMBtu/hour. [06-096 CMR 115, BPT]
2. Total annual heat input into Boiler #1 shall be limited to 177,930 MMBtu/year, on a twelve-month rolling-total basis. [06-096 CMR 115, BPT]
3. Compliance shall be demonstrated by fuel records showing the quantity of fuel (wood) used. Records of annual fuel use shall be kept on a monthly basis. [06-096 CMR 115, BPT and 40 CFR Part 60, Subpart Dc (§60.48c(g)(2))]

The following is a new condition in addition to those in air emissions license A-9-71-O-R.

(23) Boiler #2

A. Fuel

Boiler #2 is license to fire LPG only. [06-096 CMR 115, BACT]

B. Emissions shall not exceed the following:

Equipment	Pollutant	lb/MMBtu	Origin and Authority
Boiler #2	PM	0.01	06-096 CMR 115, BACT

C. Emissions from the Boiler #2 shall not exceed the following [06-096 CMR 115, BACT]:

Equipment	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler #2	0.08	0.08	0.01	0.67	2.53	0.17

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D. Visible Emissions

Visible emissions from Boiler Stack #2, servicing Boiler #2, shall not exceed 10% opacity on a six-minute block average basis. [06-096 CMR 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS 23 DAY OF September, 2016.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Mauro Allen Robert Cone for
PAUL MERCER, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-9-71-O-R.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: August 30, 2016

Date of application acceptance: September 2, 2016

Date filed with the Board of Environmental Protection:

This Order prepared by Kevin J Ostrowski, Bureau of Air Quality.

