



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



PAUL R. LEPAGE  
GOVERNOR

PATRICIA W. AHO  
COMMISSIONER

**Lepage Bakeries Cedar Street, LLC  
Androscoggin County  
Lewiston, Maine  
A-967-71-D-A (SM)**

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

**FINDINGS OF FACT**

After review of the air emissions 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**

Lepage Bakeries Cedar Street, LLC (Lepage) was issued Air Emission License A-967-71-B-N/A on January 22, 2013 permitting the operation of emission sources associated with their baked goods production facility.

Lepage has requested an amendment to their license in order to allow for an increase in their bakery production and VOC emissions attributed to changes in their product lines and related recipes. In addition, Lepage proposes to utilize AP-42 emission factors instead of the American Institute of Baking (AIB) emission factors previously used. Due to the anticipated increase in VOC emissions, Lepage has proposed to control the increase in its VOC emissions by installing a catalytic oxidizer.

The equipment addressed in this license is located at 83 Cedar Street, Lewiston, Maine.

AUGUSTA  
17 STATE HOUSE STATION  
AUGUSTA, MAINE 04333-0017  
(207) 287-7688 FAX: (207) 287-7826  
RAY BLDG., HOSPITAL ST.

BANGOR  
106 HOGAN ROAD, SUITE 6  
BANGOR, MAINE 04401  
(207) 941-4570 FAX: (207) 941-4584

PORTLAND  
312 CANCO ROAD  
PORTLAND, MAINE 04103  
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE  
1235 CENTRAL DRIVE, SKYWAY PARK  
PRESQUE ISLE, MAINE 04769  
(207) 764-0477 FAX: (207) 760-3143

B. Emission Equipment

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

**Fuel Burning Process Equipment**

<u>Equipment ID</u>	<u>Maximum Capacity (MMBtu/hr)</u>	<u>Maximum Firing Rate scf/hr</u>	<u>Fuel Type</u>	<u>Stack ID</u>
Bread Oven	6.48	6,171	natural gas	Cat. Oxidizer stack
Roll Oven	4.66	4,438	natural gas	Cat. Oxidizer stack
Muffin Oven 1	1.56	1,486	natural gas	Cat. Oxidizer stack
Muffin Oven 2	1.56	1,486	natural gas	Cat. Oxidizer stack
Catalytic Oxidizer #1	4.00	4,000	natural gas	Cat. Oxidizer stack

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 regulations. The emission increases are determined by subtracting the current licensed emissions preceding the modification from the maximum future licensed allowed emissions, as follows:

<u>Pollutant</u>	<u>Current License (TPY)</u>	<u>Future License (TPY)</u>	<u>Net Change (TPY)</u>	<u>Sig. Level</u>
PM	4.4	5.26	0.86	100
PM <sub>10</sub>	4.4	5.26	0.86	100
SO <sub>2</sub>	0.1	0.11	0.01	100
NO <sub>x</sub>	14.1	15.77	1.67	100
CO	9.5	11.46	1.96	100
VOC	39	39	0	50
CO <sub>2</sub> e	<100,000	<100,000	<100,000	100,000

This modification is determined to be a minor modification, in addition, with an operating hours restriction on the emergency generators and the facility restriction on total VOC emissions, the facility is listed below the major source thresholds and is considered a synthetic minor and has been processed as such.

## 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 as well as for those sources located in designated non-attainment areas.

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.

BPT for existing emissions equipment means that method which controls or reduces emissions to the lowest possible level considering:

- the existing state of technology;
- the effectiveness of available alternatives for reducing emissions from the source being considered; and
- the economic feasibility for the type of establishment involved.

### **Process Description**

The baking operations at Lepage consist of a bread oven, roll oven, and two muffin ovens. In bread baking, the yeast metabolizes sugar through anaerobic fermentation producing both carbon dioxide and ethanol. Ethanol is a VOC which remains in a liquid state in the bread through the pre-baking process and vaporizes when exposed to high temperatures in the oven.

Lepage recently changed ownership to Flowers Food, Inc. of Thomasville, GA (A-967-71-C-T). Due to the corporate change, Lepage anticipates an increase in production, the reformulation of certain product lines and introduction of new product lines. To address these changes, Lepage requested a short term interim VOC emissions increase as part of their most recent license renewal (A-967-71-B-N/A).

The existing operations at Lepage were permitted using a baking method described as “water brew” or “liquid brew” process in lieu of the traditional “sponge dough” or “straight dough” processes. This liquid brew process, with its low yeast content and lower fermentation time, more closely emulates the testing performed by the American Institute of Baking (AIB International).

However, the new formulations may no longer use the “water brew” or “liquid brew” method. Instead, Lepage may use the classic “straight dough” process for certain products. This process utilizes higher yeast contents and results in longer spike times, increasing VOC emissions from the four ovens. To mitigate the higher levels of VOC, Lepage is proposing to install a natural gas-fired catalytic oxidizer as BACT to reduce VOC emissions from the new recipes.

**B. Process Equipment**

Calculations to estimate emissions in license A-967-71-B-N/A used AIB emission factors relevant to the “liquid” or “wet brew” method. Lepage, under its new ownership will be incorporating the straight dough method with the higher yeast concentration and spiking times. Therefore, the AIB emission factors are no longer applicable to all formulations at the facility. To be conservative, Lepage will be calculating potential VOC emissions based on the equation developed in EPA’s Alternative Control Technology (ACT) for Bakery Oven Emissions for all existing and new formulations. This equation is also in Section 9.9.6 of U.S. EPA’s AP-42 emission factor documentation.

$$\text{VOC [lbs/ton dough baked]} = 0.95 \times Y_i + 0.195 \times T_i - 0.51 \times S - 0.86 \times T_s + 1.90$$

Where:

- Y<sub>i</sub> = initial baker’s percent of yeast
- T<sub>i</sub> = total yeast action time in hours
- S = final (spike) baker’s percent of yeast
- T<sub>s</sub> = spiking time in hours

**Emissions from Increased Production and Recipe changes  
 Before and After the Catalytic Oxidizer**

	VOC Lb/hr Pre Control (worst cast)	VOC Lb/hr After Control	VOC TPY Pre Control (worst case)	VOC TPY After Control
Bread Oven	97.42	4.87	426.69	21.33
Roll Oven	28.03	1.4	122.79	6.14
Muffin 1 Oven	25.69	1.28	112.5	5.63
Muffin 2 Oven	22.73	1.14	99.55	4.98
Total	173.87	8.69	761.53	38.08

As part of Lepage’s 2007 license application, Lepage reviewed four VOC control options: thermal oxidation, adsorption, wet scrubbing and changing the baking process. Due to its increased VOC emissions, Lepage is proposing to use a catalytic oxidizer to reduce these emissions below the Reasonably Available Control Technology (RACT) and major source thresholds of 40 and 50 tpy VOCs

respectively. The control efficiency for the oxidizer will be 95% destruction. Catalytic oxidation is widely accepted as the top control technology for commercial bakeries; a similar Maine facility, with a VOC emission of 39 tons after controls, was licensed with a catalytic oxidizer. Based on the size of the Lepage facility and the proposed emissions, the Department accepts Lepage's proposal to control VOC emissions with a catalytic oxidation unit.

*Catalytic Oxidizer*

Lepage plans to install a catalytic oxidizer in late spring/early summer of 2014. The catalytic oxidizer shall be capable of a destruction efficiency of 95%. The unit has a nominal capacity of 4000 scf/hr and a burner capacity of 4 MMBtu/hr firing natural gas. VOC emissions will be collected from the Bread Oven, the Roll Oven, and the Muffin Ovens and sent to the catalytic oxidizer.

BACT Findings

The BACT emission limits for the catalytic oxidizer were based on the following:

Natural Gas

- PM/PM<sub>10</sub> – 0.05 lb/MMBtu based on 06-096 CMR 115, BPT
- 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
- Opacity – 06-096 CMR 101

The BACT emission limits for the catalytic oxidizer are the following:

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)
Catalytic Oxidizer #1	0.2	0.2	0.01	0.39	0.33	0.02

Visible emissions from the catalytic oxidizer shall not exceed 20% opacity on a 6 minute block average, except for no more than one (1) six (6) minute block average in a 3 hour period.

1. Periodic Monitoring

Lepage shall capture and control emissions from the baking equipment with the catalytic oxidizer to achieve a destruction efficiency of 95%.

Lepage shall monitor and record the inlet and outlet temperature of the catalytic oxidizer.

2. 40 CFR Part 63 Subpart JJJJJ

The catalytic oxidizer is not subject to Subpart JJJJJ since the catalytic oxidizer is not considered a “boiler”.

C. Annual Emissions

1. Lepage has the following annual emissions based on the following:

- Licensed natural gas fired units operating 8,760 hours per year
- Generators #1, #2, and #3 each limited to 500 hours of operation per year based on a 12 month rolling total firing diesel with a maximum sulfur content of 15 ppm sulfur.
- Lepage is limited to a total of 39 tons of VOC per year for the entire facility based on a 12 month rolling total basis.
- Assumed 95% destruction efficiency for the VOC emissions from the ovens

Total Licensed Annual Emissions for the Facility

**Tons/year**

(used to calculate the annual license fee)

	PM	PM <sub>10</sub> / PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC
Bread Oven (Combustion)	1.43	1.43	0.02	2.70	2.27	0.15
Roll Oven (Combustion)	1.03	1.03	0.01	1.94	1.63	0.11
Muffin Oven 1 (Combustion)	0.34	0.34	0.01	0.65	0.55	0.04
Muffin Oven 2 (Combustion)	0.34	0.34	0.01	0.65	0.55	0.04
Bread Oven* (Vent)	-	-	-	-	-	21.33
Roll Oven* (Vent)	-	-	-	-	-	6.14
Muffin Oven 1* (Vent)	-	-	-	-	-	5.63
Muffin Oven 2* (Vent)	-	-	-	-	-	4.98
Catalytic Oxidizer	0.88	0.88	0.01	1.72	1.44	0.09
Boiler #1	0.37	0.37	0.01	0.70	0.6	0.04
Boiler #2	0.37	0.37	0.01	0.70	0.6	0.04
Generator #1	0.26	0.26	0.01	2.91	1.9	0.19
Generator #2	0.12	0.12	0.01	1.9	0.96	0.09
Generator #3	0.12	0.12	0.01	1.9	0.96	0.09
<b>Total TPY</b>	<b>5.26</b>	<b>5.26</b>	<b>0.11</b>	<b>15.77</b>	<b>11.46</b>	<b>39.0</b>

\*based on 95% control efficiency of catalytic oxidizer

## 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 (CO<sub>2</sub>e).

Based on the facility's fuel use, the worst case emission factors from AP-42, IPCC (Intergovernmental Panel on Climate Change), and *Mandatory Greenhouse Gas Reporting*, 40 CFR Part 98, and the global warming potentials contained in 40 CFR Part 98, Lepage is below the major source threshold of 100,000 tons of CO<sub>2</sub>e per year. Therefore, no additional licensing requirements are needed to address GHG emissions at this time.

### III. AMBIENT AIR QUALITY ANALYSIS

The level of ambient air quality impact modeling required for a minor source shall be determined by the Department on a case-by case basis. In accordance with 06-096 CMR 115, an ambient air quality impact analysis is not required for a minor source if the total 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 facility licensed emissions 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.

The Department has determined that an ambient air quality impact analysis is not required for the facility and that Ambient Air Quality Standards (AAQS) will not be exceeded.

## 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-967-71-D-A subject to the conditions found in Air Emission License A-967-71-B-N/A and A-967-71-C-T, and in the following conditions.

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

### SPECIFIC CONDITIONS

**This Condition will replace condition (21) in Air Emission License A-967-71-B-N/A:**

#### (21) VOC Emission Limits

- A. Lepage shall be limited to 39 tons of VOC per year for the entire facility. Total VOC emissions from the Bread Oven, the Roll Oven, the Muffin Ovens and the catalytic oxidizer, combined shall be limited to 38.5 tons of VOC per year on a 12 month rolling total basis.
- B. Lepage shall maintain records of baking production in each yeast leavened production line. Records shall include the following:
  - a. initial yeast as a percent of flour;
  - b. total fermentation time in hours (yeast action time);
  - c. yeast spike as a percent of flour;
  - d. spike time in hours
  - e. ethanol emission factor (lbs VOC/ton product) and
  - f. total amount of product produced (production in tons).

Lepage shall calculate and record total yeast leavened product production VOC emission (tons every calendar month and on a 12-month rolling total basis) using the following equation:

$$\text{VOC [lbs/ton dough baked]} = 0.95 \times Y_i + 0.195 \times T_i - 0.51 \times S - 0.86 \times T_s + 1.90$$

Where:

- Y<sub>i</sub> = initial baker's percent of yeast
- T<sub>i</sub> = total yeast action time in hours
- S = final (spike) baker's percent of yeast
- T<sub>s</sub> = spiking time in hours

- C. Lepage shall keep records of production amounts from each oven documenting the type and quantity of product put through the bread oven, the roll oven and the muffin ovens.

**The following is a new condition in Air Emission License A-967-71-B-N/A:**

**(25) Catalytic Oxidizer #1**

- A. Lepage shall install a Catalytic Oxidizer by late Fall of 2014 to capture and control VOC emissions from Bread Oven, Roll Oven, Muffin Oven 1 and Muffin Oven 2 utilizing the Catalytic Oxidizer #1 except during malfunction and breakdown conditions. [06-096 CMR 115, BACT]
- B. Emissions shall not exceed the following [06-096 CMR 115, BACT]:

Equipment	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)
Catalytic Oxidizer #1	0.2	0.2	0.01	0.39	0.33	0.02

- C. Visible emissions from Catalytic Oxidizer #1 shall each not exceed 20% opacity on a six (6) minute block average, except for no more than one (1) six (6) minute block average in a continuous 3-hour period.  
[06-096 CMR 101]

- D. Lepage shall operate Catalytic Oxidizer #1 such that it achieves a VOC destruction efficiency of 95%. Compliance shall be demonstrated by stack testing of Catalytic Oxidizer #1 within 6 months from the date of startup and at least once every 5 years thereafter. Testing shall be conducted in accordance with EPA Test Method 25A or other method approved by the Department. Establish and adhere to temperature ranges as established during the testing. [06-096 CMR 115, BACT]
- E. Lepage shall monitor and record the following as specified, for the catalytic oxidizer to demonstrate compliance with the inlet and outlet catalytic oxidizer temperature limits establish the most recent stack test:

Parameter for Catalytic Oxidizer	Monitor	Record
inlet temperature to the catalytic oxidizer	Continuously*	Continuously*
outlet temperature from the catalytic oxidizer	Continuously*	Continuously*

\* continuously means monitoring and recording at least one reading per minute and averaged hourly  
[06-096 CMR 115, BACT]

- F. Lepage shall perform annual core testing of the catalyst and replace the catalyst material in accordance with the manufacturer's recommendations.  
[06-096 CMR 115, BACT]
- G. Catalytic Oxidizer #1 shall be operated and maintained according to the manufacturer's specifications.
- H. Lepage shall maintain records of the date and number of hours of each malfunction or breakdown event for Catalytic Oxidizer #1. Lepage shall calculate and record uncontrolled VOC emissions for each oven during each malfunction or breakdown.
- I. For the equipment parameter monitoring (catalytic oxidizer inlet and outlet temperature) and recording, required by this license, the licensee shall maintain records of the most current six year period and the records shall include
1. Documentation which shows monitor operational status during all source operating time, including specifics for calibration and audits;
  2. Catalytic Oxidizer #1 inlet and outlet temperature data shall be made available to the Department upon request;

Lepage Bakeries Cedar Street, LLC  
Androscoggin County  
Lewiston, Maine  
A-967-71-D-A (SM)

11

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

3. Records of the initial performance test and any subsequent test demonstrating the destruction efficiency of each catalytic oxidizer including the minimum inlet temperature to the oxidizer catalytic bed and initial destruction efficiency including operational information affecting the capture of the unit must be recorded; and
4. Records of annual core testing of the oxidizer catalyst.

DONE AND DATED IN AUGUSTA, MAINE THIS 7 DAY OF May, 2014.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Mauro Allen Robert Corne for  
PATRICIA W. AHO, COMMISSIONER

**The term of this amendment shall be concurrent with the term of Air Emission License A-967-71-B-N/A.**

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 12/23/2013

Date of application acceptance: 12/30/2013

Date filed with the Board of Environmental Protection:

This Order prepared by Lisa P. Higgins, Bureau of Air Quality.

