



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION



PAUL R. LEPAGE
GOVERNOR

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COMMISSIONER

**Kerry Inc.
Cumberland County
Portland, Maine
A-901-71-E-R**

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

FINDINGS OF FACT

After review of the air emissions license renewal 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

Kerry Inc. has applied to renew their Air Emission License permitting the operation of emission sources associated with their coffee roasting/extraction facility.

The equipment addressed in this license is located at 40 Quarry Road, Portland, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license:

Boilers

<u>Equipment</u>	<u>Maximum Capacity (MMBtu/hr)</u>	<u>Maximum Firing Rate (scf/hr)</u>	<u>Fuel Type, % sulfur</u>	<u>Manf. Date</u>	<u>Stack #</u>
Boiler #1*	4.5	4,370	Natural Gas, negligible	2004	1
Boiler #2*	4.5	4,370	Natural Gas, negligible	2004	2

*The maximum capacities of Boilers #1 and #2 have been corrected based on heat input instead of the previously reported heat output.

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Coffee Roasters

<u>Equipment</u>	<u>Maximum Capacity (MMBtu/hr)</u>	<u>Maximum Firing Rate (scf/hr)</u>	<u>Fuel Type, % sulfur</u>	<u>Stack #</u>
Coffee Roaster #1	1.6 (1.2 ton/hr)	1,550	natural gas, negligible	3
Roaster #1 Cat. Oxidizer Burner	2.2	2,108	natural gas, negligible	3
Roaster #1 Therm. Oxidizer Burner	3.0	2,941	natural gas, negligible	3
Coffee Roaster #2	1.6 (1.2 ton/hr)	1,550	natural gas, negligible	3
Roaster #2 Cat. Oxidizer Burner	2.2	2,108	natural gas, negligible	3
Roaster #2 Therm. Oxidizer Burner	3.0	2,941	natural gas, negligible	3

C. Application Classification

The application for Kerry Inc. does not include the licensing of increased emissions or the installation of new or modified equipment. Therefore, the license is considered to be a renewal of currently licensed emission units only and has been processed through *Major and Minor Source Air Emission License Regulations*, 06-096 Code of Maine Rules (CMR) 115 (as amended). With the emission limits on the coffee roasters the facility is 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 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.

B. Boilers #1 & #2

Kerry Inc. operates Boilers #1 and #2 which fire natural gas and have a maximum heat input of 4.5 MMBtu/hr each. The boilers were installed in 2004 and each vent through their own dedicated stack, Stack #1 and Stack #2 respectively.

1. 40 CFR Part 60, Subpart Dc

Due to their size, the boilers are 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.

2. 40 CFR Part 63 Subpart JJJJJ

Gas-fired boilers are exempt from *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*, 40 CFR Part 63 Subpart JJJJJ.

3. BPT Findings

The BPT emission limits for the boilers were based on the following:

- PM/PM₁₀ – 0.05 lb/MMBtu based on 06-096 CMR 115, BPT
- SO₂ – 0.6 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
- NO_x – 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 BPT emission limits for the boilers are the following:

<u>Unit</u>	<u>Pollutant</u>	<u>lb/MMBtu</u>
Boiler #1	PM	0.05
Boiler #2	PM	0.05

<u>Unit</u>	<u>PM</u> <u>(lb/hr)</u>	<u>PM₁₀</u> <u>(lb/hr)</u>	<u>SO₂</u> <u>(lb/hr)</u>	<u>NO_x</u> <u>(lb/hr)</u>	<u>CO</u> <u>(lb/hr)</u>	<u>VOC</u> <u>(lb/hr)</u>
Boiler #1	0.23	0.23	neg	0.44	0.37	0.02
Boiler #2	0.23	0.23	neg	0.44	0.37	0.02

Visible emissions from the boilers shall each not exceed 10% opacity on a 6 minute block average, except for no more than one (1) six (6) minute block average in a 3 hour period.

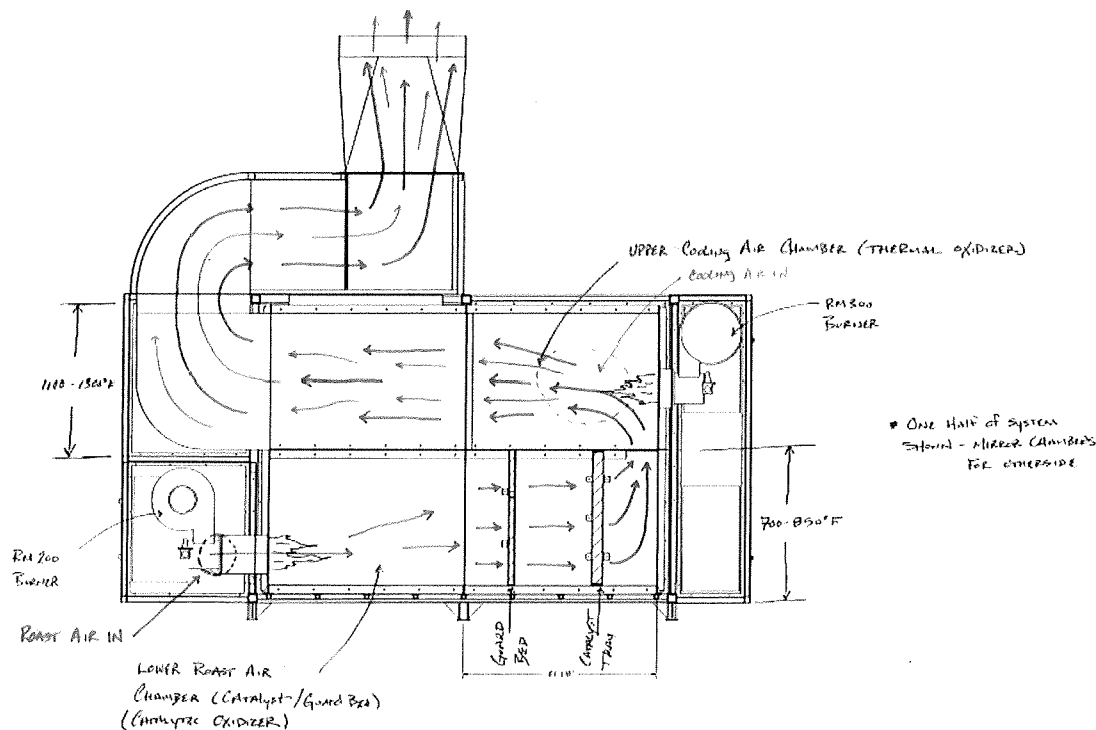
C. Coffee Roasters #1 & #2

Kerry Inc. operates two (2) coffee roasters each with a maximum heat input of 1.6 MMBtu/hr and a maximum process rate of 1.2 ton of coffee beans per hour.

When the coffee beans are roasted above 350°F chaff is released that can lead to significant amounts of particulate matter (PM). Additionally, volatile organic compounds (VOCs) start to volatilize and are emitted as well.

1. Control Equipment

Kerry Inc. uses a combination catalytic and thermal oxidizer system with pretreatment by cyclones to control emissions of PM and VOC from the coffee roasters. Each roaster vents to its own cyclone and catalytic/thermal oxidizer system. Emissions from the two roasters are then combined and exit through a single stack.



Each roaster generates two distinct emissions streams during different stages of the roasting cycle. The entire roast cycle takes about 20 minutes. The “roast air” stream is generated over the 10-15 minute period when the beans are heated. This stream contains relatively low levels of PM. The “cooling air” stream occurs for a brief period of about 2 minutes at the end of each roast and contains higher levels of PM.

The roast air passes through a cyclone to remove chaff and other large particles and then passes through a catalytic oxidizer section of the control unit. The treated exhaust from the catalytic oxidizer chamber passes through the thermal oxidizer chamber to preheat it in preparation for operation during the cooling cycle.

When there is approximately one minute remaining in the roast, the cooling air fan begins drawing cool ambient air through the cooling bin, and the thermal oxidizer begins to fire. When the roast is complete, the hot beans drop into the cooling bin. Cool air flows upwards through the beans, through a cyclone, and then through the thermal oxidizer chamber.

Kerry Inc. has worked with the control system's manufacturer to minimize visible emissions and optimize the system control logic to minimize natural gas usage.

The catalytic oxidizer fires when the roast temperature is above 250°F and remains on until the roast is complete or the catalytic oxidizer temperature exceeds 600°F. The thermal oxidizer begins firing during the roasting period once the roaster temperature reaches 410°F and continues firing for two minutes after the beans drop into the cooling bin. A certified visible emissions test was performed on June 20, 2014 to demonstrate Kerry Inc.'s ability to control visible emissions to within license limits based on this control logic.

2. BPT Findings

Due to the variability in the process and the difficulty of verifying actual emissions, a conservative control efficiency for the control equipment of 90% has been assumed. The emissions factors stated below are assumed to represent worst-case emissions.

The BPT emission limits for each of the coffee roasters (including control equipment) were based on the following:

PM/PM ₁₀	– 0.12 lb/ton based on AP-42, Table 9.13.2-1 dated 9/95
SO ₂	– Determined to be negligible based on the firing of natural gas in the coffee roasters and control unit.
NO _x	– 100 lb/MMscf based on AP-42 dated 7/98 for the coffee roaster burners and manufacturer data for the catalytic (70 ppm) and thermal (60 ppm) oxidizers.
CO	– 0.55 lb/ton based on AP-42, Table 9.13.2-2 dated 9/95
VOC	– 0.047 lb/ton based on AP-42, Table 9.13.2-2 dated 9/95
Opacity	– 06-096 CMR 115, BPT

The BPT emission limits for the coffee roasters are the following:

<u>Unit</u>	<u>PM (lb/hr)</u>	<u>PM₁₀ (lb/hr)</u>	<u>SO₂ (lb/hr)</u>	<u>NO_x (lb/hr)</u>	<u>CO (lb/hr)</u>	<u>VOC (lb/hr)</u>
Coffee Roaster #1	0.15	0.15	neg	0.58	0.68	0.06
Coffee Roaster #2	0.15	0.15	neg	0.58	0.68	0.06

Operation of the control system in the manner described above is determined to meet BPT for control of PM and VOC from the coffee roasters.

Visible emissions from the coffee roaster combined stack (Stack #3) 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.

D. Annual Emissions

1. Total Annual Emissions

Kerry Inc. shall be restricted to the following annual emissions, based on a calendar year. The tons per year limits were calculated based on operation of the coffee roasters and boilers for 8760 hours per year.

Total Licensed Annual Emissions for the Facility

Tons/year

(used to calculate the annual license fee)

	PM	PM₁₀	SO₂	NO_x	CO	VOC
Boiler #1	1.0	1.0	neg	1.9	1.6	0.1
Boiler #2	1.0	1.0	neg	1.9	1.6	0.1
Coffee Roaster #1	0.7	0.7	neg	2.5	3.0	0.3
Coffee Roaster #2	0.7	0.7	neg	2.5	3.0	0.3
Total TPY	3.4	3.4	neg	8.8	9.2	0.8

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).

Based on the facility's fuel use limit(s), 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, Kerry Inc. is below the major source threshold of 100,000 tons of CO₂e 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 licensed annual emissions of any pollutant released do not exceed the following levels and there are no extenuating circumstances:

<u>Pollutant</u>	<u>Tons/Year</u>
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.

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-901-71-E-R subject to 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.

STANDARD CONDITIONS

- (1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions (38 M.R.S.A. §347-C).
- (2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115. [06-096 CMR 115]
- (3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both. [06-096 CMR 115]
- (4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive dust, and shall submit a description of the program to the Department upon request. [06-096 CMR 115]
- (5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S.A. §353-A. [06-096 CMR 115]
- (6) The license does not convey any property rights of any sort, or any exclusive privilege. [06-096 CMR 115]
- (7) The licensee shall maintain and operate all emission units and air pollution systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions. [06-096 CMR 115]
- (8) The licensee shall maintain sufficient records to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request. [06-096 CMR 115]
- (9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for a renewal of a license or amendment shall not stay any condition of the license. [06-096 CMR 115]

- (10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license. [06-096 CMR 115]
- (11) In accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department, the licensee shall:
- A. perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:
 - 1. within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or
 - 2. pursuant to any other requirement of this license to perform stack testing.
 - B. install or make provisions to install test ports that meet the criteria of 40 CFR Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and
 - C. submit a written report to the Department within thirty (30) days from date of test completion.
- [06-096 CMR 115]
- (12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:
- A. within thirty (30) days following receipt of such test results, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department; and
 - B. the days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and
 - C. the licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.
- [06-096 CMR 115]
- (13) Notwithstanding any other provisions in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of

establishing whether a person has violated or is in violation of any statute, regulation, or Part 70 license requirement. [06-096 CMR 115]

- (14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emissions and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation. [06-096 CMR 115]
- (15) Upon written request from the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such a manner as the Department shall prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status. [06-096 CMR 115]

SPECIFIC CONDITIONS

(16) Boilers #1 & #2

- A. Kerry Inc. shall fire only natural gas in Boilers #1 and #2. [06-096 CMR 115, BPT]
- B. Emissions shall not exceed the following:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
Boiler #1	PM	0.05	06-096 CMR 115, BPT
Boiler #2	PM	0.05	06-096 CMR 115, BPT

- C. Emissions shall not exceed the following [06-096 CMR 115, BPT]:

Emission Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler #1	0.23	0.23	neg	0.44	0.37	0.02
Boiler #2	0.23	0.23	neg	0.44	0.37	0.02

- D. Visible emissions from Boilers #1 and #2 shall each not exceed 10% 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]

(17) **Coffee Roasters #1 & #2**

- A. Kerry Inc. shall fire only natural gas in Coffee Roasters #1 and #2 and in the associated catalytic and thermal oxidizers. [06-096 CMR 115, BPT]
- B. Emissions shall not exceed the following [06-096 CMR 115, BPT]:

Emission Unit	PM (lb/hr)	PM₁₀ (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Coffee Roaster #1	0.15	0.15	0.58	0.68	0.06
Coffee Roaster #2	0.15	0.15	0.58	0.68	0.06

- C. Visible emissions from the coffee roaster combined stack (Stack #3) shall 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 115, BPT]
- D. Kerry Inc. shall operate the cyclones at all times the associated coffee roaster is operating. The catalytic and thermal oxidizer systems shall be operated, per the established control system logic, at all times the associated coffee roaster is operating. [06-096 CMR 115, BPT]
- E. Kerry Inc. shall monitor the temperature in each catalytic oxidizer and thermal oxidizer section of the control unit. During the roasting period, the catalytic oxidizer burner shall fire when the roaster temperature is above 250°F and remain on until the roast is complete or the catalytic oxidizer temperature reaches a minimum temperature of 600°F. Prior to the cooling period, the thermal oxidizer burner shall fire when the roaster temperature reaches 410°F and remain on for two (2) minutes after the beans drop into the cooling bin. Kerry Inc. shall continuously monitor the temperature in each chamber while in operation and record the temperature of the catalytic oxidizer chamber during the roasting period and the temperature of the thermal oxidizer during a cooling period at least once per shift. [06-096 CMR 115, BPT]
- F. Kerry Inc. shall continuously monitor the pressure drop across each catalyst bed while in operation and record the pressure drop across each catalyst bed at least once per shift. If the pressure rises to 0.8"WC or greater, Kerry Inc. shall shut down the roasters, perform a visual inspection of the control equipment, and clean the catalyst beds if necessary. [06-096 CMR 115, BACT]
- G. Kerry Inc. shall perform a visual inspection of the cyclones and oxidizers, including the catalyst bed, at least once every three years. Kerry Inc. shall maintain records of the inspections as well as any maintenance (routine or otherwise) performed on the control equipment. [06-096 CMR 115, BPT]

Kerry Inc.
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- (18) Kerry Inc. shall notify the Department within 48 hours and submit a report to the Department on a quarterly basis if a malfunction or breakdown in any component causes a violation of any emission standard (38 M.R.S.A. §605).

DONE AND DATED IN AUGUSTA, MAINE THIS 3 DAY OF October, 2014.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Patricia W. Aho
PATRICIA W. AHO, COMMISSIONER

The term of this license shall be ten (10) years from the signature date above.

[Note: If a complete renewal application, as determined by the Department, is submitted prior to expiration of this license, then pursuant to Title 5 MRSA §10002, all terms and conditions of the license shall remain in effect until the Department takes final action on the renewal of the license.]

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 8/27/14

Date of application acceptance: 9/2/14

Date filed with the Board of Environmental Protection:

This Order prepared by Lynn Muzzey, Bureau of Air Quality.

