STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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Town of Falmouth **Falmouth School Department** **Cumberland County** **Falmouth, Maine** **A-805-71-E-A (SM)**	**Departmental** **Findings of Fact and Order** **Air Emission License** **Amendment #1**

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 M.R.S.A., §344 and §590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

The Town of Falmouth, Falmouth School Department was issued Air Emission License A-805-71-D-A/R on May 31, 2011, permitting the operation of emission sources associated with their High School and Middle School. The current license includes four oil fired boilers, one wood chip boiler, and an emergency generator.

Falmouth School Department has requested an amendment to their license for the following:

- installation of a new 6.25 MMBtu/hr boiler, firing green wood chips;
- clarification of the maximum design capacity of the existing wood fired boiler as 8.5 MMBtu/hr, rather than the 9.9 MMBtu/hr listed in the current license;
- corrections to the existing oil boilers' maximum design capacities; and
- addition of a second existing generator to the license (located at the elementary school) and correction to the design capacity of the currently licensed generator.

The equipment addressed in this license is located at 51 Woodville Road in Falmouth, Maine.

B. Emission Equipment

The following equipment is addressed in this air emission license:

Boilers

Equipment	Campus Site	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type	Install. Date	Stack #	Changes
Boiler 1 *(existing)*	MS	4.2 *(previous license: 4.4)*	30 gal/hr *(previous license: 31.4)*	#2 fuel oil, ASTM D396	1965	1	*Revision to licensed capacity*
Boiler 2 *(existing)*	MS	4.9 *(previous license: 4.4)*	34.7 gal/hr *(previous license: 31.4)*	#2 fuel oil	1974	1	*Revision to licensed capacity*
Boiler 3 *(existing)*	HS	5.4 *(previous license: 4.2)*	38.5 gal/hr *(previous license: 30)*	#2 fuel oil	2000	2	*Revision to licensed capacity*
Boiler 4 *(existing)*	HS	5.4 *(previous license: 4.2)*	38.5 gal/hr *(previous license: 30)*	#2 fuel oil	2000	3	*Revision to licensed capacity*
Boiler 5 *(existing)*	HS	8.5 *(previous license: 9.9)*	0.9 tons/hr *(previous license: 1.0)*	Green Wood Chips	2010	4	*Revision to licensed capacity*
Boiler 6 *(new)*	MS	6.25	0.6 tons/hr	Green Wood Chips	TBD	5	*New – add to license*

Emergency Generators

Equipment	Campus Site	Maximum Capacity (MMBtu/hr)	Kilo-watt (kW)	Firing Rate (gal/hr)	Fuel Type	Install. Date	Stack #	Changes
Generator 1 *(existing)*	HS	4.7 *(previous license: 2.5)*	500	34.4 *(previous license: 18)*	Diesel	2005	7	*Revision to licensed capacity and stack #*
Generator 2 *(existing–not licensed)*	ES	4.7	500	34.4	Diesel	2010	8	*Existing – add to license*

Notes for Equipment Tables: ES = Elementary School, MS = Middle School, and HS = High School

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:

Pollutant	Current License (TPY)	Future License (TPY)	Net Change (TPY)	Sig. Level
PM	6.6	9.0	+2.4	100
PM_{10}	6.6	9.0	+2.4	100
SO_2	17.8	18	+0.2	100
NO_X	14.9	21.3	+6.4	100
CO	6.3	11.2	+4.9	100
VOC	0.6	0.6	0	50
CO_2e	N/A	<100,000	N/A	100,000

This modification is determined to be a minor modification 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.

B. Boilers 1-5

This amendment updates the maximum input rating for the existing five boilers. Physical changes have not been made to the units, but corrections are needed based on verification of the boiler nameplate information.

Boilers 1-4 are package boilers firing #2 fuel oil meeting ASTM D396 standards. Boiler 1 is a Cleaver Brooks Boiler rated at 4.2 MMBtu/hr (30 gal/hr), located at the Middle School and installed in 1965. Boiler 2 is an Iron Fireman-Webster (Whirlpower) Boiler rated at 4.9 MMBtu/hr (34.7 gal/hr), located at the Middle School and installed in 1974. Boilers 3 and 4 are each HB Boilers rated at 5.4 MMBtu/hr (38.5 gal/hr), located at the high school and installed in 2000.

Boiler 5 is a Messersmith Boiler rated at 8.5 MMBtu/hr firing green wood chips (0.9 tons/hr), located at the High School and installed in 2010.

The currently licensed emission limits for each of the boilers change slightly with the capacity revisions. The following tables list the basis for the emission limits and the revised lb/hr emission rates:

Basis for Emission Limits

	#2 Fuel Oil		Green Wood Chips	
Pollutant	**Emission Factor**	**Basis**	**Emission Factor**	**Basis**
PM	0.12 lb/MMBtu	06-069 CMR 103	0.3 lb/MMBtu	06-069 CMR 103
PM_{10}	0.12 lb/MMBtu	06-069 CMR 103	0.3 lb/MMBtu	06-069 CMR 103
SO_2	0.5 lb/MMBtu	ASTM D396 fuel	0.025 lb/MMBtu	AP-42 Table 1.6
NO_X	0.3 lb/MMBtu	Previous license	0.22 lb/MMBtu	AP-42 Table 1.6
CO	5 lb/1000 gal	AP-42 Table 1.3	0.6 lb/MMBtu	AP-42 Table 1.6
VOC	0.34 lb/1000 gal	AP-42 Table 1.3	0.017 lb/MMBtu	AP-42 Table 1.6

Boiler 1-5 Updated Emission Limits

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler 1 (4.2 MMBtu/hr)	0.50	0.50	2.12	1.26	0.15	0.01
Boiler 2 (4.9 MMBtu/hr)	0.59	0.59	2.47	1.47	0.18	0.01
Boiler 3 (5.4 MMBtu/hr)	0.65	0.65	2.72	1.62	0.19	0.01
Boiler 4 (5.4 MMBtu/hr)	0.65	0.65	2.72	1.62	0.19	0.01
Boiler 5 (8.5 MMBtu/hr)	2.55	2.55	0.21	1.87	5.10	0.14

C. Boiler 6

Falmouth School Department has proposed to install Boiler 6, provided by Messersmith Manufacturing, rated at a maximum heat input of 6.25 MMBtu/hr (0.6 tons/hr) firing green wood chips. The heat content of the wood is estimated to be 4900 Btu/lb (higher heating value at 45% moisture content). The new boiler is intended to provide heat and hot water to the Middle School, and possibly other buildings, while displacing a large portion of the #2 fuel oil currently fired in the existing oil boilers. Boiler 6 will exhaust through its own stack, designated as stack 5, at an above ground height of 65 feet and an inside diameter of 1.75 feet.

Wood chips will be conveyed via belt conveyor from the fuel storage bunker to a metering bin. Two variable speed augers will deliver the wood chips from the metering bin to the stoker auger. The stoker auger then will convey fuel to the combustion chamber.

The Messersmith Institutional and Industrial Combustion System is a "stoker" combustor coupled with a three pass wet back packaged firebox boiler. The combustion chamber temperatures range from 1500-2000°F. Underfire and overfire air, automated combustion controls, and the boiler design itself all maximize combustion efficiency and control. The combustor is separated from the boiler with a refractory shelf, allowing for the required operating temperature range, an increased flame path, and improved mixing of combustion gases and secondary air.

The combustion unit/boiler system will be controlled with a programmable logic controller, monitoring various parameters (boiler temperature, stack temperature, air pressure, digital on/off signals, etc.) to determine the proper operating fuel feed rate. BACT, as described below, also includes the use of a multicyclone with a recirculation duct.

Due to the size of the boiler, it 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.

1. BACT Findings

Falmouth School Department submitted a BACT analysis for the proposed Boiler 6. The BACT submittal included a review of EPA's RACT/BACT/LAER Clearinghouse (RBLC); EPA's AP-42 Emissions Database; State Agencies (Maine, Connecticut, New Hampshire, Vermont,

Rhode Island, and Massachusetts); *Air Emissions Test Report: Small Biomass Energy System Particulate Matter Emissions Testing* by Gammie Air Monitoring, LLC and Vermont Air Pollution Control Division (June 2009); *Emission Controls for Small Wood-Fired Boilers*, produced for the U.S. Forest Service by Resource System Group (2010); *Controlling Emission from Wood Boilers* produced by the Northeast States for Coordinated Air Use Management (October 2008); and vendor information.

The following table contains recently permitted sources in New England:

Summary of Comparable Licensed Sources

Location	Heat Input (MMBtu/hr)	PM/PM_{10} Control Methods	Permitted PM_{10} Limit (lb/MMBtu)	Basis for Limit
Oakland, ME	8.75	Multicyclone	0.25	BACT analysis
Houlton, ME	2.7	Multicyclone & Baghouse	0.03*	Proposed Boiler MACT and BACT analysis
Falmouth, ME	9.9	Multicyclone	0.3	BACT analysis
Paxton, MA (wood pellets)	7.0	Multicyclone	0.1	BACT analysis
Somers, CT	25.1	ESP	0.1	BACT analysis
Salisbury, CT	26.7	ESP	0.057	BACT analysis
Glocester, RI	4.6	High Efficiency Multicyclone	0.20	BACT analysis
North Scituate, RI	9.1	High Efficiency Multicyclone	0.10	BACT analysis
Groton, MA	12	Cyclone & Baghouse	0.10	State Emission Limit
Keene, NH	6.7	ESP	0.30	State Emission Limit
Montpelier, VT	6.7 & 9.3	ESP	0.20	Most Stringent Emission Rate (MSER) Analysis

* Note: The Houlton, ME facility installed the baghouse to meet the proposed Boiler MACT, with a condition that the PM emissions limit could be reevaluated and possibly modified if the Boiler MACT limits were less stringent than proposed. The numeric limit was removed from the MACT prior to finalization.

The following summarizes the BACT findings for Boiler 6:

PM/PM_{10} – Particulate emissions from fuel combustion is formed from incomplete combustion of fuel and non-combustible material in the fuel. Potential particulate matter controls for wood-fired boilers consists of add-on controls, combustion of clean fuels, good combustion practices, or a combination of options.

The evaluation of add-on controls for this boiler included mechanical collectors, dry electrostatic precipitators (ESPs), baghouses (fabric filters), electrostatic recyclones, and wet scrubbers.

Mechanical collectors separate particulate matter from an exhaust stream utilizing centrifugal force. Types of mechanical collectors include single cyclones, multicyclones, high efficiency multicyclones (HEMCs), and core separators. Single cyclones and multicyclones remove a large portion of larger particles and a smaller portion of smaller particles. Traditionally, for single cyclones and multicyclones the design control efficiency is met only at maximum load when a higher pressure drop is achieved. High efficiency multicyclones have a higher collection efficiency due to use of a higher pressure drop, however, this results in greater energy demands. In addition, a test on a smaller wood boiler with a high efficiency multiclone in North Scituate, RI resulted in a low capture efficiency when operated at low loads. Core Separator™ is a specific control design that maintains a relatively high pressure drop at all operating loads, but it is a high cost option. Messersmith Manufacturing, the Boiler 6 project vendor, has created a multicyclone which maintains pressure drop at all operating capacities. The multicyclone is connected to a recirculation duct, increasing pressure drop. Mechanical collectors are feasible for Boiler 6 and a mulitcyclone was considered BACT for particulate matter control.

Dry electrostatic precipitators (ESPs) consist of charging particles in the exhaust stream with a high voltage, oppositely charging a collection surface where the particles accumulate, removing the collected dust by a rapping process, and collecting the dust in hoppers. An electrostatic precipitator was determined not to be economically feasible due to high capital costs for a boiler of this size.

Baghouses collect particulate matter on the surface of filter bags which are periodically cleaned or replaced to maintain a high removal efficiency. Historically, baghouses have not been selected for small wood boilers due to fire hazards and the potential for filter bag clogging. Financial and technical resources are needed not only to purchase the baghouse and

replacement filter bags, but to service the unit to proactively prevent fire and/or clogging problems. Due to the cost and uncertainty of operational issues of baghouses on wood fired boilers of this size, baghouses were not considered BACT for Boiler 6.

An electrostatic recyclone consists of a single cyclone coupled with an electrified cylindrical chamber. The electrified chamber exhaust is re-circulated back to the cyclone causing particle agglomeration. As the agglomeration gets larger, particles are more likely to be captured by the cyclone component of the system. These types of units are installed in Europe, but none are currently operating in the United States and were not considered as BACT for Boiler 6.

Wet scrubbers consist of using particle inertia and pressure to transfer particles from the gas stream to a liquid stream using a wet spray. The liquid is purged and the particles removed. A wet scrubber was found to be infeasible due to the economics of the capital and ongoing operational costs; as well as the environmental issues of make-up water requirements and disposal. No wet scrubbers were found to be operational on smaller wood fired units. Wet scrubbers were not considered BACT for this project.

BACT for particulate matter emissions from Boiler 6 is the use of the efficient new Messersmith Institutional and Industrial Combustion System, a Messersmith Manufacturing multicyclone with recirculating duct, good combustion practices, and the following emission limits:

PM Emission Limit	PM_{10} Emission Limit	Emission Limit Basis
0.25 lb/MMBtu, 1.56 lb/hr	0.25 lb/MMBtu, 1.56 lb/hr	06-096 CMR 115, BACT

The limits are more stringent than the particulate matter limit found in *Fuel Burning Equipment Particulate Emission Standard*, 06-096 CMR 103 (as amended).

SO_2 – Sulfur dioxide is formed from the combustion of sulfur present in the fuel. Control options for SO_2 include removing the sulfur from the flue gas by adding a caustic scrubbing solution or restricting the sulfur content of the fuel. Wood is an inherently low sulfur content fuel. A wet scrubbing system, with associated annual operating costs for caustic, energy, operation, and maintenance, is economically infeasible for this size boiler.

BACT for SO_2 emissions from Boiler 6 shall be the utilization of clean, green wood chips (a low sulfur fuel) and the following emission limit:

SO_2 Emission Limit	Emission Limit Basis
0.16 lb/hr	AP-42 Table 1.6, dated 9/03 (0.025 lb/MMBtu)

NO_X – Nitrogen oxide is generated from fuel NO_X and thermal NO_X. Reducing NO_X formation includes firing a low nitrogen content fuel to minimize fuel NO_X and maintaining specific combustion temperatures to minimize thermal NO_X. Add-on NO_X control options consist of selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR). Combustion control techniques for NO_X emission reductions include staged combustion, burner modifications, low excess firing air, flue gas recirculation, and combustion of clean fuels.

Add-on SCR and SNCR controls are primarily used on large industrial and utility boilers. SCR and SNCR reduce NO_X emissions through the injection of urea or ammonia in the gas exhaust stream under specific temperature ranges; specifically 1600-2100°F for SNCR and 575-800°F for SCR. The specific temperature range requirements, the need for a continuously high operating load, and the cost for SNCR and SCR do not make it feasible for these controls to be installed on Boiler 6.

BACT for NO_X emissions from Boiler 6 shall be the installation of a new, efficient boiler, good combustion and maintenance practices (including automated operating controls, equipment sensors, tune-ups, raking the grates as needed, and staged combustion), the use of clean wood fuel, and the following emission limits:

NO_X Emission Limit	Emission Limit Basis
1.38 lb/hr	AP-42 Table 1.6, dated 9/03 (0.22 lb/MMBtu)

CO – Carbon monoxide emissions are a result of incomplete combustion, caused by conditions such as insufficient residence time or limited oxygen availability. CO emissions from boilers are typically minimized by good combustion, although oxidation catalyst systems have been used on larger units.

BACT for CO emissions from Boiler 6 shall be the installation of a new, efficient boiler, good combustion and maintenance practices (including automated operating controls, equipment sensors, tune-ups, raking the grates as needed, and staged combustion), the use of clean wood fuel, and the following emission limit:

CO Emission Limit	Emission Limit Basis
1.13 lb/hr	06-096 CMR 115, BACT (0.18 lb/MMBtu)

VOC – Volatile organic compound emissions are a result of incomplete combustion. Add-on controls for VOC emissions include thermal oxidizers, oxidation catalysts, and venturi scrubbers. However, VOC emissions from boilers are typically minimized by good combustion.

BACT for VOC emissions from Boiler 6 shall be the installation of a new, efficient boiler, good combustion and maintenance practices (including automated operating controls, equipment sensors, tune-ups, raking the grates as needed, and staged combustion), the use of clean wood fuel, the use of a multicyclone with a recirculation duct to collect VOCs which condense on solid particles, and the following emission limit:

VOC Emission Limit	Emission Limit Basis
0.11 lb/hr	AP-42 Table 1.6, dated 9/03 (0.017 lb/MMBtu)

GHG – Greenhouse gas emissions are minimized from small to mid-sized units by the use of lower carbon content fuel. Wood chips are classified as biogenic and EPA has deferred addressing biogenic (wood/biomass) related GHG emissions for at least another two years until they have completed an analysis of the carbon neutrality of various types of biogenic fuel. Based on the size and efficiency of the boiler, and the corresponding estimated small potential GHG emissions from the unit, no specific GHG emission limits are required for Boiler 6 at this time.

Opacity - Visible emissions from Boiler 6 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.

Additional BACT findings –

The requirements applicable to Boiler 6 in 40 CFR Part 63, Subpart JJJJJJ, including work practice standards and compliance, recordkeeping, and reporting requirements shall be considered BACT for Boiler 6.

The fuel limit total for Boiler 6 and Boiler 5 shall be limited to 3000 tons/year of clean, green wood chips at 45% moisture content and 4900 Btu/lb heat content, or equivalent, based on a 12-month rolling total. Compliance with the fuel use limit may be based on delivery records,

calculation of fuel use through auger rotations, calculations based on steam production, or other methods as approved by the Department.

Periodic Monitoring -

Periodic monitoring for Boiler 6 shall include recordkeeping to document fuel use on a monthly and 12-month rolling total basis.

2. 40 CFR Part 63 Subpart JJJJJJ

Boiler 6 is subject to the *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources* (40 CFR Part 63 Subpart JJJJJJ). The unit is considered a new boiler rated less than 10 MMBtu/hr.

A summary of the currently applicable federal 40 CFR Part 63 Subpart JJJJJJ requirements is listed below. The rule is currently undergoing revisions. At this time, the Maine Department of Environmental Protection has not taken delegation of this area source MACT (Maximum Achievable Control Technology) rule promulgated by EPA, however Falmouth School Department is subject to the requirements for Boiler 6 since the requirements are considered BACT. Notification forms and additional rule information can be found on the following website:
http://www.epa.gov/ttn/atw/boiler/boilerpg.html.

a. Compliance Dates, Notifications, and Work Practice Requirements

i. Initial Notification of Compliance
An Initial Notification shall be submittal to EPA within 120 days after the source becomes subject to the standard. [40 CFR Part 63.11225(a)(2)]

ii. Boiler Tune-Up Program

(a) A boiler tune-up program shall be implemented upon startup of the boiler [40 CFR Part 63.11196(c)]

(b) The boiler tune-up program, conducted to demonstrate continuous compliance, shall be performed as specified below:

1. As applicable, inspect the burner, and clean or replace any component of the burner as necessary. Delay of the burner inspection until the next scheduled shutdown is permitted; however, the burner must be inspected at least once every 36 months. [40 CFR Part 63.11223(b)(1)]

2. Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern, consistent with the manufacturer's specifications. [40 CFR Part 63.11223(b)(2)]
3. Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure it is correctly calibrated and functioning properly. [40 CFR Part 63.11223(b)(3)]
4. Optimize total emissions of CO, consistent with manufacturer's specifications. [40 CFR Part 63.11223(b)(4)]
5. Measure the concentration in the effluent stream of CO in parts per million (ppm), by volume, and oxygen in volume percent, before and after adjustments are made. [40 CFR Part 63.11223(b)(5)]
6. If a unit is not operating on the required date for a tune-up, the tune-up must be conducted within one week of start-up. [40 CFR Part 63.11223(b)(7)]

(c) A Notification of Compliance Status shall be submitted to EPA no later than 120 days after conducting the initial boiler tune-up. [40 CFR Part 63.11225(a)(4) and 40 CFR Part 63.11214(b)]

(d) The facility shall implement a boiler tune-up program after the initial tune-up and initial compliance report has been submitted.
1. Each tune-up shall be conducted at a frequency specified by the rule and based on the size and age of the boiler. [40 CFR Part 63.11223(a)]
2. The tune-up compliance report shall be maintained onsite and, if requested, submitted to EPA. The report shall contain the concentration of CO in the effluent stream (ppmv) and oxygen in volume percent, measured before and after the boiler tune-up, a description of any corrective actions taken as part of the tune-up of the boiler, and the type and amount of fuel used over the 12 months prior to the tune-up of the boiler. [40 CFR Part 63.11223(b)(6)] The compliance report shall also include the company name and address; a compliance statement signed by a responsible official certifying truth, accuracy, and completeness; and a description of any deviations and corrective actions. [40 CFR Part 63.11225(b)]

b. Recordkeeping

Records shall be maintained consistent with the requirements of 40 CFR Part 63 Subpart JJJJJJ including the following [40 CFR Part 63.11225(c)]: copies of notifications and reports with supporting compliance documentation; identification of each boiler, the date of tune-up,

procedures followed for tune-up, and the manufacturer's specifications to which the boiler was tuned; documentation of fuel type(s) used monthly by each boiler; the occurrence and duration of each malfunction of the boiler; and actions taken during periods of malfunction to minimize emissions and actions taken to restore the malfunctioning boiler to its usual manner of operation. Records shall be in a form suitable and readily available for expeditious review.

D. Emergency Generators 1 and 2

Falmouth School Department operates 2 emergency generators. The 500 kW emergency Cummins generators are each rated at a maximum heat input of 4.7 MMBtu/hr (34.4 gal/hr) and fire diesel fuel oil with a sulfur content of 0.0015%, by weight. Emergency Generator 1, manufactured in 2005, is located at the high school and Emergency Generator 2, manufactured in 2010, is located at the elementary school.

This license amendment updates the information in the previous license for Emergency Generator 1 and adds Emergency Generator 2 as a licensed unit.

1. BPT Findings

The BPT emission limits for the generators are based on the following:

Basis for Emission Limits

Pollutant	Diesel Fuel Oil	
	Emission Factor	**Basis**
PM	0.12 lb/MMBtu	06-069 CMR 103
PM_{10}	0.12 lb/MMBtu	06-069 CMR 103
SO_2	0.0015 lb/MMBtu	0.0015% sulfur diesel fuel
NO_X	3.2 lb/MMBtu	AP-42 Table 3.4 (dated 10/96)
CO	0.85 lb/MMBtu	AP-42 Table 3.4 (dated 10/96)
VOC	0.09 lb/MMBtu	AP-42 Table 3.4 (dated 10/96)

The BPT emission limits for the generators are the following:

Emergency Generator Emission Limits

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Emergency Generator 1 (4.7 MMBtu/hr)	0.56	0.56	0.007	15.04	4.00	0.42
Emergency Generator 2 (4.7 MMBtu/hr)	0.56	0.56	0.007	15.04	4.00	0.42

Additional BPT requirements for the generators include the following:

Opacity – Visible emissions from each of the diesel emergency generators shall not exceed 20% opacity on a 6 minute block average, except for no more than two (2) six (6) minute block averages in a 3 hour period.

Each of the emergency generators shall be limited to 500 hours of operation a year, based on a 12 month rolling total. Falmouth School Department shall keep records of the hours of operation for each unit.

For Generator 1, within the 500 hour per year operating limit, the unit shall be limited to no more than 15 hours of demand response (peak load reduction operation) for each 12-month rolling total. Falmouth School Department shall keep records of demand response operation which includes the date, the hours of operation for the generator, and documentation from a third party indicating that Falmouth School Department was advised to reduce its load for predicted peak system demand during those dates and times. For Generator 2, the requirements of 40 CFR Part 60, Subpart IIII shall apply, as summarized below.

2. 40 CFR Part 63, Subpart ZZZZ – not applicable

The federal regulation 40 CFR Part 63, Subpart ZZZZ, *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines* is not applicable to the emergency generators listed above. The units are considered existing, emergency stationary reciprocating internal combustion engines at an area HAP source; however, they are considered exempt from the requirements of Subpart ZZZZ since they are categorized as institutional emergency engines.

3. 40 CFR Part 60, Subpart IIII – applicable to Emergency Generator 2

The federal regulation 40 CFR Part 60, Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE)* is applicable to the Emergency Generator 2 listed above since the unit was ordered after July 11, 2005 and manufactured after April 1, 2006.

Emergency Definition:

Emergency stationary internal combustion engine is defined in 40 CFR Part 60, Subpart IIII as any stationary internal combustion engine whose operation is limited to emergency situations and required testing and maintenance. Examples include stationary ICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary ICE used to pump water in the case of fire or flood, etc. Stationary CI ICE used to supply power to an electric grid or that supply power as part of a financial arrangement with another entity are not considered to be emergency engines.

40 CFR Part 60, Subpart IIII Requirements:

Emergency Generator 2 shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in 40 CFR §60.4202. [40 CFR §60.4205(b)]

The diesel fuel fired in Emergency Generator 2 shall not exceed 15 ppm sulfur (0.0015% sulfur). [40 CFR §60.4207(b)]

A non-resettable hour meter shall be installed and operated on Emergency Generator 2. [40 CFR §60.4209(a)]

Emergency Generator 2 shall be operated and maintained according to the manufacturer's emission-related written instructions or procedures developed by Falmouth School Department that are approved by the engine manufacturer. Falmouth School Department may only change those emission-related settings that are permitted by the manufacturer. [40 CFR §60.4211(a)]

Emergency Generator 2 shall be limited to 100 hours/year for maintenance and testing. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving or

generating income or a financial arrangement with another entity). [40 CFR §60.4211(f)]

No initial notification is required for emergency engines. [40 CFR §60.4214(b)]

E. Annual Emissions

1. Total Annual Emissions

Falmouth School Department shall be restricted to the following annual emissions, based on a 12-month rolling total. The tons per year limits were calculated based on 500,000 gal/yr #2 fuel oil, 3000 tons/yr wood chips (45% moisture, 4900 Btu/lb), and 500 hrs/yr for each generator:

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
Boilers 1-4	4.2	4.2	17.6	10.5	1.3	0.09
Boilers 5 and 6	4.5	4.5	0.4	3.3	8.9	0.3
Generators 1 and 2	0.3	0.3	0.004	7.5	1.0	0.2
Total TPY	**9.0**	**9.0**	**18.0**	**21.3**	**11.2**	**0.6**

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_2e).

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, Falmouth School Department is below the major source threshold of 100,000 tons of CO_2e

per year. Therefore, no additional licensing requirements are needed to address GHG emissions at this time.

III. AMBIENT AIR QUALITY ANALYSIS

According to 06-096 CMR 115, the level of air quality analyses required for a minor source shall be determined on a case-by case basis. Modeling is not required for if the total emissions of any pollutant released do not exceed the following and there are no extenuating circumstances:

Pollutant	Tons/Year
PM	25
PM_{10}	25
SO_2	50
NO_x	100
CO	250

Based on the total facility licensed emissions, Falmouth School Department is below the emissions level required for modeling.

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-805-71-E-A subject to the conditions found in Air Emission License A-805-71-D-R/A 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

The following shall replace condition (16) in air emission license A-805-71-D-R/A:

(16) **Boilers 1-4**

A. Fuel

1. Total fuel use for facility's oil fired boilers shall not exceed 500,000 gal/yr of #2 fuel oil, based on a 12 month rolling total basis. [06-096 CMR 115, BPT]
2. Prior to January 1, 2016, the facility shall fire ASTM D396 compliant #2 fuel oil (max. sulfur content of 0.5% by weight). [06-096 CMR 115, BPT]
3. Beginning January 1, 2016, the facility shall fire #2 fuel oil with a maximum sulfur content limit of 0.005% by weight (50 ppm). [38 MRSA §603-A(2)(A)(3)]
4. Beginning January 1, 2018, the facility shall fire #2 fuel oil with a maximum sulfur content limit of 0.0015% by weight (15 ppm). [38 MRSA §603-A(2)(A)(3)]
5. Compliance shall be demonstrated by fuel records from the supplier showing the type and quantity of the fuel delivered. Records of annual fuel use shall be kept on a monthly and 12-month rolling total basis. [06-096 CMR 115, BPT]

B. Emissions from Boilers 1-4 shall not exceed the following:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
Boiler 1	PM	0.12	06-096 CMR 103, Section 2(B)(1)(a)
Boiler 2	PM	0.12	06-096 CMR 103, Section 2(B)(1)(a)
Boiler 3	PM	0.12	06-096 CMR 103, Section 2(B)(1)(a)
Boiler 4	PM	0.12	06-096 CMR 103, Section 2(B)(1)(a)

C. Emissions from Boilers 1-4 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 (4.2 MMBtu/hr)	0.50	0.50	2.12	1.26	0.15	0.01
Boiler 2 (4.9 MMBtu/hr)	0.59	0.59	2.47	1.47	0.18	0.01
Boiler 3 (5.4 MMBtu/hr)	0.65	0.65	2.72	1.62	0.19	0.01
Boiler 4 (5.4 MMBtu/hr)	0.65	0.65	2.72	1.62	0.19	0.01

D. Visible emissions from each of the Boilers 1-4 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 101]

The following shall replace condition (17) in air emission license A-805-71-D-R/A:

(17) **Boiler 5**

A. Total wood fuel use for Boiler 5 and Boiler 6 combined shall not exceed 3000 tons/yr of wet wood (45% moisture), or equivalent, on a 12-month rolling total basis. Compliance with the fuel use limit may be based on delivery records (including the number of wood chip truckloads delivered and the weight of the wood per delivery), calculation of fuel use through auger rotations, calculations based on steam production, or other methods as approved by the Department. Records of annual fuel use shall be kept on a monthly and 12-month rolling total basis. [06-096 CMR 115, BPT]

B. Falmouth School Department shall operate a multicyclone on Boiler 5 for particulate matter control. Falmouth School Department shall maintain a log detailing all routine and non-routine maintenance on the multicyclone. The

log shall include the date and description of the maintenance performed. [06-096 CMR 115, BPT]

C. Emissions from Boiler 5 shall not exceed the following:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
Boiler 5	PM	0.3	06-096 CMR 103, Section 2(B)(4)(a)

D. Emissions from Boiler 5 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 5 (8.5 MMBtu/hr)	2.55	2.55	0.21	1.87	5.10	0.14

E. Visible emissions from Boiler 5 shall not exceed 20% opacity on a six (6) minute block average, except for no more than two (2) six (6) minute block average in a continuous 3-hour period. [06-096 CMR 115, BPT]

The following shall replace condition (18) in air emission license A-805-71-D-R/A:

(18) **Emergency Generators 1 and 2**

A. Emergency Generators 1 and 2 are each limited to 500 hours per year total operation, based on a 12 month rolling total. Compliance shall be demonstrated by a written log of all generator operating hours. [06-096 CMR 115, BPT]

B. The fuel oil sulfur content for Emergency Generators 1 and 2 shall be limited to 0.0015% sulfur, by weight. Compliance shall be demonstrated by fuel records from the supplier documenting the type of fuel delivered and the sulfur content of the fuel. [06-096 CMR 115, BPT]

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

Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Emergency Generator 1 (4.7 MMBtu/hr)	0.56	0.56	0.007	15.04	4.00	0.42
Emergency Generator 2 (4.7 MMBtu/hr)	0.56	0.56	0.007	15.04	4.00	0.42

D. Visible emissions from each emergency generator shall not exceed 20% opacity on a six (6) minute block average, except for no more than two (2) six (6) minute block averages in a continuous 3-hour period. [06-096 CMR 101]

E. Emergency Generator 1 shall be limited to no more than 15 hours of demand response (peak load reduction operation) within the 500 hours operating limit for each 12-month rolling total timeframe. Falmouth School Department shall keep records of demand response operation which includes the date, the hours of operation for the generator, and documentation from a third party indicating that Falmouth School Department was advised to reduce its load for predicted peak system demand during those dates and times. [06-096 CMR 115]

F. Emergency Generator 2 shall meet the applicable requirements of 40 CFR Part 60, Subpart IIII, including the following:

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

2. The diesel fuel fired in the generator shall not exceed 15 ppm sulfur (0.0015% sulfur). Compliance with the fuel sulfur content limit shall be based on fuel records from the supplier documenting the type of fuel delivered and the sulfur content of the fuel. [40 CFR §60.4207(b) and 06-096 CMR 115]

3. A non-resettable hour meter shall be installed and operated on the generator. [40 CFR §60.4209(a)]

4. The generator shall be limited to 100 hours/year for maintenance and testing. This limit is based on a 12 month rolling total. Compliance shall be demonstrated by a written log of all generator operating hours. [40 CFR §60.4211(e) and 06-096 CMR 115]

5. The generator shall be operated and maintained according to the manufacturer's written instructions or procedures developed by Falmouth School Department that are approved by the engine manufacturer. Falmouth School Department may only change those settings that are permitted by the manufacturer. [40 CFR §60.4211(a)]

The following is a new condition:

(20) **Boiler 6**

A. Total wood fuel use for Boiler 6 and Boiler 5 combined shall not exceed 3000 tons/yr of wet, clean wood chips (45% moisture and 4900 Btu/lb), or equivalent, on a 12-month rolling total basis. Compliance with the fuel use limit may be based on delivery records (including the number of wood chip truckloads delivered and the weight of the wood per delivery), calculation of fuel use through auger rotations, calculations based on steam production, or other methods as approved by the Department. Records of annual fuel use shall be kept on a monthly and 12-month rolling total basis. [06-096 CMR 115, BACT]

B. Falmouth School Department shall operate a multicyclone with a recirculation duct on Boiler 6 for particulate matter control. Falmouth School Department shall maintain a log detailing all routine and non-routine maintenance on the multicyclone. The log shall include the date and description of the maintenance performed. [06-096 CMR 115, BACT]

C. Emissions from Boiler 6 shall not exceed the following:

Emission Unit	Pollutant	lb/MMBtu	Origin and Authority
Boiler 6	PM	0.25	06-096 CMR 103, Section 2(B)(4)(a)

D. Emissions from Boiler 6 shall not exceed the following [06-096 CMR 115, BACT]:

Emission Unit	PM (lb/hr)	PM_{10} (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler 6 (6.25 MMBtu/hr)	1.56	1.56	0.16	1.38	1.13	0.11

E. Visible emissions from Boiler 6 shall not exceed 20% opacity on a six (6) minute block average, except for no more than two (2) six (6) minute block average in a continuous 3-hour period. [06-096 CMR 115, BACT]

F. 40 CFR Part 63 Subpart JJJJJJ

Falmouth School Department shall comply with all of the requirements of 40 CFR Part 63, Subpart JJJJJJ applicable to Boiler 6 including, but not limited to, the following: submittal of an Initial Notification, a Notice of Intent, and a Notice of Compliance; tune-ups; recordkeeping; and reporting. [40 CFR Part 63, Subpart JJJJJJ and 06-096 CMR 115, BACT]

DONE AND DATED IN AUGUSTA, MAINE THIS 26th DAY OF June , 2012.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Melanie Loyzim for
PATRICIA W. AHO, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-805-71-D-R/A.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: April 2, 2012
Date of application acceptance: April 4, 2012

Date filed with the Board of Environmental Protection:

This Order prepared by Kathleen E. Tarbuck, Bureau of Air Quality.

Filed
JUN 27 2012
State of Maine
Board of Environmental Protection