



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

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COMMISSIONER

**Corinth Wood Pellets, LLC
Penobscot County
Corinth, Maine
A-956-71-B-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

Corinth Wood Pellets, LLC (Corinth Wood Pellets) has requested an amendment to their air emission license for the following purposes:

1. Update the license regarding the installation of several cyclones, and in some cases baghouses, to control particulate matter emissions generated by various process equipment, including coolers, hammermills, grinders, pelletizers, and material sorting and handling operations.
2. Add language to the license reflecting the construction of a wood storage building to reduce fugitive particulate matter emissions and maintain wood quality and moisture content in an effort to improve operations and reduce emissions from the pellet making process.
3. Add language reflecting the installation of new pelletizers capable of more effectively processing spruce and hardwood allowing the facility to reduce its reliance on pine, which they have found tends to be more challenging to process than spruce or hardwood.
4. Add automatic burner controls to tie fuel feed shut-offs to rotary dryer inlet temperature readings and to tie burner chamber combustion air fan speeds to burner chamber temperature readings.
5. Update the license reflecting the replacement of the existing rotary dryer cyclones (operating on positive pressure) with new negative draft cyclones in an effort to reduce particulate matter emissions from the drying process. The new cyclones will also be accompanied by taller exhaust stacks.

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6. Add language addressing the reconfigured operating method associated with processing pine through the dryers. When processing pine or a pine mix in excess of 25% by weight, the two dryer lines are to be used in series where the pine is partially dried in the first rotary dryer and then sent through the second rotary dryer to complete the drying process. This method of operation reduces visible emissions while processing pine.
7. Change the method of determining the annual processing limit for the rotary dryers so that it is tied to the amounts of each species of wood being processed and the PM and VOC licensed annual emission limits associated with each wood species.
8. Revise language in the license indicating a reduced maximum rotary dryer inlet temperature limit when processing pine. The rotary dryer inlet temperature limit will be 650 degrees Fahrenheit (°F) when processing pine or a mix consisting of greater than 25% pine by weight instead of the 800 degree Fahrenheit (°F) limit when processing other softwood species or hardwoods.

B. Emission Equipment

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

Fuel Burning Equipment

<u>Equipment</u>	<u>Maximum Capacity (MMBtu/hr)</u>	<u>Maximum Firing Rate</u>	<u>Fuel Type, % sulfur</u>	<u>Post Comb. Controls</u>	<u>Stack #</u>
Burner #1	20	1.26 tons/hr ¹	wood chips/shavings/sawdust, %S negligible	cyclone	1
Burner #2	20	1.26 tons/hr ¹	wood chips/shavings/sawdust, %S negligible	cyclone	2

¹ Based on a 50%/50% softwood/hardwood blend @ 12% moisture by weight from the Rotary Dryer

Process Equipment

<u>Equipment</u>	<u>Max. Finished Material Process Rate</u>	<u>Pollution Control Equipment</u>	<u>Stack #</u>
Rotary Dryer #1	11.1 ² ODT/hr	cyclone	1
Rotary Dryer #2	11.1 ² ODT/hr	cyclone	2
Screening/Pellet Processing Operations	11.1 ² ODT/hr	cyclones (3)	3, 4, & 5
Feed Stock Conveying Systems	N/A	cyclones (2)	6 & 7

² Based on a moisture content of 0% by weight and referred to as oven-dried tons per hour (ODT/hr).

C. Application Classification

The modification of a minor source is considered a major 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	23	25	2	100
PM ₁₀	23	25	2	100
SO ₂	0.5	0.6	0.1	100
NO _x	4	6.5	2.5	100
CO	41	75.5	34.5	100
VOC	31	48	17	50

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 (last amended December 24, 2005). Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

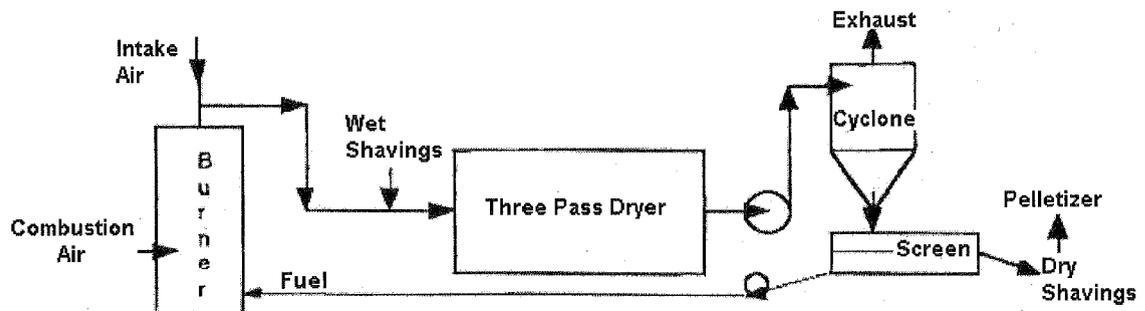
BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in *Definitions Regulation*, 06-096 CMR 100 (last amended December 24, 2005). BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

Before proceeding with the control requirements for each unit a general process description is provided to identify where the equipment fits into the process.

Process Description

Corinth Wood Pellets produces wood pellets to be sold as fuel for pellet-fired wood stoves. The facility operates two wood pellet processing lines each consisting of a triple-pass rotary dryer capable of processing 11.1 ODT/hr of wood chips/shavings/sawdust (based on a moisture content of 0% by weight) utilizing a direct wood-fired burner with a maximum heat input capacity of 20 MMBtu/hr to provide the heat for the rotary dryer.

Typical Wood Pellet Processing Plant Process Diagram



Wet wood chips/shavings/sawdust are received at the facility and introduced into either one of two triple-pass rotary dryers with hot air supplied by the exhaust gas from the direct wood-fired burners. The dryers reduce the moisture content of wet wood material from approximately 50% by weight to typical moisture contents of between 6% and 12% by weight, or lower. The exhaust from each rotary dryer enters a cyclone, which separates the dried wood material from the air. The air is exhausted out of the cyclone through a stack. The dried wood material is further processed by screening equipment. The dried wood material that doesn't pass through the screen is made into pellets, bagged, and sold as wood pellet fuel. The dried sawdust-like undersized wood particles that fall through the screen are conveyed to the direct wood-fired burners for use as fuel, where they are fired in semi-suspension to enhance complete combustion.

Corinth Wood Pellets has found that the original pelletizers installed at the facility work well for pelletizing pine, but are not as effective in pelletizing spruce and hardwoods. Therefore, in an effort to improve operations and reduce emissions, Corinth Wood Pellets recently installed pelletizers better designed to process spruce and hardwoods.

B. Rotary Dryers #1 & #2 and Burners #1 & #2

Corinth Wood Pellets performs the wood drying process through the operation of two triple-pass rotary dryers (Rotary Dryers #1 & #2) each capable of processing 11.1 ODT/hr of wood chips/shavings/sawdust (based on a moisture content of 0% by weight) utilizing direct wood-fired burners (Burners #1 & #2) each with a maximum heat input capacity of 20 MMBtu/hr to provide the heat necessary to dry the wood material. The rotary dryers are used to dry wood chips/shavings/sawdust for the production of wood pellets to be sold for use in pellet-fired wood stoves.

The direct wood-fired burners are operated in a manner to maintain a burner chamber temperature of around 1400°F. Due to the combination of high combustion temperatures and the firing of dry (12% moisture by weight) wood materials in suspension, the burners produce relatively low emissions of sulfur dioxide (SO₂), carbon monoxide (CO) and volatile organic compounds (VOC). Burner chamber temperatures are not so high as to cause the creation of thermal NO_x (generally occurring at temperatures of 2000°F or higher). Ash that is generated from combustion is carried along with the hot flue gases into the rotary dryers where the gases and ash come into direct contact with the wet wood chips/shavings/sawdust being dried. This direct-contact process removes much of the ash from the exhaust stream. The gases from the rotary dryers which include the burner exhaust gases exhaust to the atmosphere after passing through a cyclone which separates the dried wood materials from the air stream. The air that is drawn out of the cyclone exhausts through a stack into the ambient air.

The manufacturer's recommended rotary dryer inlet temperature was between 750°F and 850°F. The manufacturer indicated that at higher temperatures the hot gases may cause the resin in the wood to "cook out" creating blue, hazy visible emissions from the cyclone exhaust. To prevent the emission of this blue haze, Corinth Wood Pellets' original air emission license contained a maximum rotary dryer inlet temperature of 800°F on the rotary dryers. During operation of the rotary dryers over the first year, Corinth Wood Pellets determined that while the maximum rotary dryer inlet temperature of 800°F is appropriate during the processing of most softwoods and hardwoods, it was too high when processing pine wood species. Through experimenting with different operating methods while processing pine, Corinth Wood Pellets has determined that the most effective processing method and associated operating conditions while processing pine, includes running the material through the two rotary dryers in series rather than in parallel and maintaining rotary dryer inlet temperatures no higher than 650°F.

In an effort to improve operations of the rotary dryers and reduce particulate matter emissions, Corinth Wood Pellets is in the process of replacing the original cyclones (designed to operate under positive pressure) with negative pressure cyclones where the air is drawn through the cyclone as opposed to being pushed through the cyclone.

A summary of the BACT analysis for Rotary Dryers #1 & #2 and Burners #1 & #2 is the following:

1. Particulate Matter (PM & PM₁₀) and Volatile Organic Compounds (VOCs)
Particulate matter (PM & PM₁₀) and VOC emissions from the wood drying operations at Corinth Wood Pellets are addressed together because they are interrelated in how they are formed and how they are controlled. Particulate matter emissions from the wood drying process mainly occur in two ways. One way they are formed is during combustion of wood in Burners #1 & #2. These particulate matter emissions are carried into the rotary dryers with the exhaust air which is used to dry the wood. In the triple pass rotary dryers the particulate matter comes in direct contact with the wood materials being dried. The dried wood materials and hot air then pass through to a cyclone where the wood materials are separated from the air and collected for further processing. Some of this particulate matter is emitted to the ambient air through the cyclone exhaust stacks. A second way that particulate matter emissions are formed are when some of the VOCs driven off from the wood materials during the drying process condense in the ambient air after being emitted through the cyclone exhaust stacks. The cyclones currently used at Corinth Wood Pellets are effective in separating the wood materials and larger particles from the air, but are ineffective in controlling VOC emissions some

of which condense into particulate matter after being released through the cyclone stacks and coming into contact with the ambient air.

Corinth Wood Pellets investigated various options for controlling particulate matter and VOC emissions from the wood drying process including the installation and use of electrostatic precipitators (ESPs), fabric filters, thermal oxidation, exhaust gas recycle, wet scrubbers, and cyclones. Corinth Wood Pellets' evaluation of control equipment options and associated recommendations are summarized in the table below.

<u>Control Technology</u>	<u>% Control PM/PM₁₀</u>	<u>% Control VOC</u>	<u>*Cost Effectiveness (\$ per ton of PM & VOC removed)</u>	<u>Feasibility</u>
ESP/Wet ESP	99+	0	19k	Feasible, but cost prohibitive
Fabric Filter	98+	0	32k	Feasible, but cost prohibitive
Thermal Oxidation	98+	98+	10k	Feasible, but cost prohibitive
Wet Scrubber	50+	50+	5k	Feasible, but cost prohibitive & waste water impacts
Exhaust Gas Recycle	40 - 60	40 - 60	5k-7.5k	Feasible, but cost prohibitive
Cyclone	Variable	0	N/A	Proposed as BACT

* Cost effectiveness numbers were estimated by the Department based on potential reductions from licensed annual emissions levels.

Corinth Wood Pellets also investigated license limits and control strategies employed by other wood pellet manufacturing plants located in Maine and New Hampshire and found that the license limits were variable and appeared to be based on either engineering estimates or emission factors for Waferboard/Oriented Strandboard Manufacturing contained in the Environmental Protection Agency's *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources* (AP-42, Chapter 10.6.1) rather than on site-specific stack test data. The control equipment utilized at the other facilities included cyclones, the combination of a cyclone followed by a wet scrubber, and multiple centrifugal cyclones. Corinth Wood Pellets proposes that the application of ESPs, fabric filters, thermal oxidation, wet scrubbers, or exhaust gas recycle does not represent BACT for various combinations of technical feasibility, environmental impact, and economic effectiveness reasons. Corinth Wood Pellets proposes that the utilization of cyclones represents BACT for control of PM and

VOC emissions from their wood drying processes.

The Department agrees that the application of ESPs, fabric filters, thermal oxidation, or wet scrubbers do not represent BACT for this facility, however the Department finds that the application of exhaust gas recycle in combination with cyclones may be a feasible BACT option. Since the exhaust gas recycle technology has not been commonly applied to these types of processes, the cost and control effectiveness is not well known. Therefore, the Department finds that exhaust gas recycle should be more thoroughly investigated for application at Corinth Wood Pellets. The Department will allow Corinth Wood Pellets 120 days from the issuance date of this license amendment to submit a report detailing the technical, economic, and environmental feasibility for installing exhaust gas recycle. If after reviewing this report, the Department determines that the technology does represent BACT, Corinth Wood Pellets shall have 270 days from this determination to install the technology and make it fully operational. Following installation and a shakedown period, the Department will establish new emission limits for PM/PM₁₀ and VOCs based on stack testing. Until such time as exhaust gas recycle technology is installed and new emission limits are established by the Department, the following emission limits shall apply.

Emission Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	VOC (lb/hr)
Pine wood species			
Rotary Dryers #1 & #2 Combined*	20.0	20.0	48.8
Other Softwood species (e.g., spruce & fir)			
Each Rotary Dryer	25.5	25.5	23.3
Hardwood species			
Each Rotary Dryer	30.0	30.0	11.1

* Because pine passes through the rotary dryers in series, lb/hr emission limits are on emissions from both rotary dryers combined.

2. Sulfur Dioxide (SO₂)

Sulfur dioxide (SO₂) emissions are formed as the result of wood combustion in Burners #1 & #2. Trace amounts of sulfur in wood combines with oxygen during the combustion process to form SO₂ which is emitted through the cyclone exhaust stacks. Wood has inherently low levels of sulfur resulting in low emissions of SO₂ when combusted.

Corinth Wood Pellets proposes no control as representing BACT for SO₂ emissions from the wood drying process and proposes an AP-42 based emission limit of 0.5 lb/hr.

The Department finds that no control of SO₂ and compliance with an emission limit of 0.5 lb/hr from each cyclone exhaust stack represents BACT for SO₂ emissions from the wood drying process.

3. Nitrogen Oxides (NO_x)

Nitrogen oxide (NO_x) emissions are formed as the result of wood combustion in Burners #1 & #2. Methods considered for controlling NO_x emissions from wood-fired burners typically include selective/selective non-catalytic reduction (SCR/SNCR), overfire air, steam/water injection, and good combustion practices.

Corinth Wood Pellets' evaluation of these methods of NO_x control resulted in a proposal of good combustion practices as the burners were designed to operate, with no additional control, representing BACT with a proposed emission limit of 5.7 lb/hr. Corinth Wood Pellets has also proposed to add automatic burner controls that would tie fuel feed shut-offs to rotary dryer inlet temperature readings and tie burner chamber combustion air fan speeds to burner chamber temperature readings. This will help control NO_x emissions by balancing burner operations with drying operations.

The Department finds that good combustion practices including the installation of automatic burner controls for the control of NO_x and compliance with an emission limit of 5.7 lb/hr from each cyclone exhaust stack represents BACT for NO_x emissions from the wood drying process.

4. Carbon Monoxide (CO)

Carbon monoxide (CO) emissions are formed as the result of wood combustion in Burners #1 & #2. Methods considered for controlling CO emissions from wood-fired burners typically include overfire air, steam/water injection, and good combustion/operating practices.

Corinth Wood Pellets' evaluation of these methods of CO control resulted in a proposal of good combustion/operating practices, with no additional control, representing BACT with a proposed emission limit of 65.5 lb/hr for pine and other softwood species and 50.0 lb/hr for hardwood. Corinth Wood Pellets has also proposed to add automatic burner controls that would tie fuel feed shut-offs to rotary dryer inlet temperature readings and tie burner chamber combustion air fan speeds to burner chamber temperature readings. This will help control CO emissions by balancing burner operations with drying operations.

The Department finds that good combustion/operating practices including the installation of automatic burner controls for the control of CO and compliance

with the proposed emissions limits represents BACT for CO emissions from the wood drying process.

5. Visible Emissions

Visible emissions are formed as the result of the wood drying process primarily in two ways. First, it should be noted that the water that is emitted from the cyclone exhaust stacks in the form of steam is not considered visible emissions. This steam is relatively easy to discern as it disappears into the air as it evaporates, albeit more readily into dry air than into humid air. One way in which visible emissions may occur is from the emission of particulate matter from the cyclone exhaust stacks. These emissions are being controlled primarily through the proper operation of the entire wood drying process including the wood-fired burners, the rotary dryers, and the cyclones. A second way in which visible emissions may occur is from VOC emissions from the cyclone exhaust stacks condensing after coming in contact with the ambient air. These emissions are being controlled through compliance with the maximum rotary dryer inlet temperatures depending on which species of wood is being processed and through the operation of the rotary dryers in series, instead of in parallel, when pine wood is being processed.

Corinth Wood Pellets did not propose a visible emissions limit in this application. The visible emissions limit contained in air emission license A-956-71-A-N came from Maine's *Visible Emissions Regulation*, 06-096 CMR 101, which limits visible emissions from similar sources to 30% on a 6-minute block average basis, except for no more than two 6-minute block averages in a 3-hour period.

Now that Corinth Wood Pellets has operated for some time, the Department has found that the visible emissions limit contained in the existing air emission license is not restrictive enough to prevent the occurrence of a public nuisance. Therefore, the Department finds that the visible emissions limit from the cyclone exhaust stacks should be reduced to 20% opacity on a 6-minute block average basis, except for no more than one 6-minute block average in a 1-hour period.

C. Screening/Pellet Processing Operations

Screening/pellet processing operations at the facility include screens, conveyors, hammermills, pelletizers, coolers, and storage and bagging operations. A majority of these operations and the equipment associated with these operations are located within a building. Corinth Wood Pellets has installed and operates three cyclones with collection points at various places within the building in an effort to control and reduce particulate matter emissions from these operations. Controlled emissions from these operations are released to the ambient air through the exhaust stacks associated with each of the three cyclones.

The Department finds that the proper operation and maintenance of these cyclones in accordance with manufacturer's recommendations and compliance with the visible emissions limits contained in finding II.E. or II.F. below, as appropriate, represents BACT for control of particulate matter emissions from most of these Screening/Pellet Processing Operations.

The Department has found that PM emissions from the hammermill are not effectively controlled through the use of a cyclone and is requiring through this license amendment that Corinth Wood Pellets install and operate a baghouse to meet BACT and more effectively control PM emissions from this process.

D. Feed Stock Conveying Systems

Feed Stock Conveying Systems at the facility include the storage of wood to be processed (whether in a storage building, bins, or in the open), conveyors, hammermill (bliss-overs), blowhog, and the movement of feedstock materials by yard equipment. Corinth Wood Pellets recently installed a building to be used as temporary storage for the wood brought into the facility before being processed into pellets. The purpose of the storage building is to help reduce fugitive PM emissions during the storage of the wood and to maintain the quality of the feed stock to help stabilize combustion and drying operations in an effort to reduce emissions. The particulate matter emissions associated with some of the other operations are collected at various points and controlled through two cyclones. Controlled emissions from these operations are released to the ambient air through the exhaust stacks associated with each cyclone.

The Department finds that use of the storage building along with the proper operation and maintenance of the cyclones in accordance with manufacturer's recommendations and compliance with the visible emissions limits contained in finding II.E. or II.F. below, as appropriate, represents BACT for control of particulate matter emissions from these Feed Stock Conveying Systems.

E. Fugitive Emissions

Visible emissions from fugitive emission sources located at the facility (including fuel/wood material stockpiles and roadways) shall not exceed 20 percent opacity, except for no more than five (5) minutes in any 1-hour period. Compliance shall be determined by an aggregate of the individual fifteen (15)-second opacity observations which exceed 20 percent in any one (1) hour.

F. General Process Emissions

Visible emissions from any general process source (not otherwise addressed in this license) shall not exceed an opacity of 20% on a six (6) minute block average

basis, except for no more than one (1) six (6) minute block average in a 1-hour period.

G. Annual Emissions

Corinth Wood Pellets shall be restricted to the following annual emissions, based on a 12 month rolling total:

**Total Licensed Annual Emissions from Rotary Dryers #1 & #2 and Burners #1 & #2
Tons/year
(used to calculate the annual license fee)**

	PM	PM ₁₀	SO ₂	NO _x	CO*	VOC	HAPS (Individual/ Total)
Rotary Dryers #1 & #2 and Burners #1 & #2	25	25	0.6	6.5	75.5	48	9.9/24.9
Total TPY	25	25	0.6	6.5	75.5*	48	9.9/24.9

* note: CO emissions are not included in determining the annual license fee

III. AMBIENT AIR QUALITY ANALYSIS

In accordance with 06-096 CMR 115, the level of air quality analyses required for a source shall be determined on a case-by case basis. Modeling and monitoring are not required for a source when the total licensed annual emissions of any pollutant released do not exceed the following levels:

<u>Pollutant</u>	<u>Tons/Year</u>
PM	25
PM ₁₀	25
SO ₂	50
NO _x	100
CO	250

Based on the total licensed annual emissions, Corinth Wood Pellets is below the emissions level required for modeling and monitoring.

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,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-956-71-B-A subject to the conditions found in Air Emission License A-956-71-A-N (unless modified below), and to the following modified and new conditions listed below.

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.

MODIFIED CONDITIONS

The following shall replace Condition (16) of License A-956-71-A-N:

(16) Rotary Dryers #1 & #2 and Burners #1 & #2

- A. Rotary Dryers #1 & #2 shall not exceed combined 12-month rolling total processing rates that cause either one of the following two equations to be incorrect. These processing rates shall include the wood that passes through the rotary dryer which also includes the fraction that is returned to Burners #1 & #2. The amount of wood processed as well as the type in terms of pine, other softwood, and hardwood shall be determined and recorded on a monthly and 12-month rolling total basis. The 12-month rolling total processing rates shall be determined based on monthly raw material consumption determinations calculated using wood delivery receipts, recorded moisture contents, and weekly raw material inventory records. This method of determining the 12-month rolling total processing rates began on January 1, 2009 and shall continue until the Department determines an alternative method is more appropriate.

VOC Equation

$$([\text{Oven Dry Tons (ODT) of Pine Processed}] * 4.4 \text{ lbs of VOC/ODT} + [\text{ODT of Other Softwoods Processed}] * 2.1 \text{ lbs of VOC/ODT} + [\text{ODT of Hardwood Processed}] * 1 \text{ lb of VOC/ODT}) / 2000 \text{ lbs/ton must be } \leq 48 \text{ TPY (tons per year) of VOCs}$$

PM Equation

([Oven Dry Tons (ODT) of Pine Processed] * 1.8 lbs of PM/ODT + [ODT of Other Softwoods Processed] * 2.3 lbs of PM/ODT + [ODT of Hardwood Processed] * 2.7 lbs of PM/ODT)/2000 lbs/ton must be \leq 25 TPY (tons per year) of PM

Lower lb/ODT limits (no less than 1.1 lb/ODT) may be utilized in the PM Equation above upon written request from Corinth Wood Pellets and confirmation by stack test results. Such use of lower PM emission factors are subject to approval by the Department.

Note: Oven-dried tons (ODT) refers to a moisture content of 0% by weight.

[06-096 CMR 115, BACT]

- B. Burners #1 & #2 are licensed to fire clean wood/woodwaste materials which may include woodchips, wood shavings, and sawdust. [06-096 CMR 115, BACT]
- C. Emissions from each (except as noted) Rotary Dryer (#1 & #2) cyclone exhaust stack shall not exceed the following emission limits as associated with each particular species of wood being processed [06-096 CMR 115, BACT]:

Emission Unit	PM (lb/ODT)	PM ₁₀ (lb/ODT)	SO ₂ (lb/MMBtu)	NO _x (lb/ODT)	CO (lb/ODT)	VOC (lb/ODT)
Pine wood species						
Rotary Dryers Combined*	1.8	1.8	0.025	0.51	5.9	4.4
Other Softwood species (e.g., spruce & fir)						
Each Rotary Dryer	2.3	2.3	0.025	0.51	5.9	2.1
Hardwood species						
Each Rotary Dryer	2.7	2.7	0.025	0.51	4.5	1.0

Emission Unit	PM (lb/hr)	PM ₁₀ (lb/hr)	SO ₂ (lb/hr)	NO _x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Pine wood species						
Rotary Dryers #1 & #2 Combined*	20.0	20.0	0.5	5.7	65.5	48.8
Other Softwood species (e.g., spruce & fir)						
Each Rotary Dryer	25.5	25.5	0.5	5.7	65.5	23.3
Hardwood species						
Each Rotary Dryer	30.0	30.0	0.5	5.7	50.0	11.1

* Because pine passes through the rotary dryers in series, lb/hr emission limits are on emissions from both rotary dryers combined.

- D. When processing pine or a mix comprised of greater than a 25% pine wood Corinth Wood Pellets shall operate Rotary Dryers #1 & #2 in series (meaning that after the wood passes through one rotary dryer it then also passes through the other). Corinth Wood Pellets shall train each of its lead drying line operators how to monitor and determine whether or not the fraction of pine being processed is above or below 25% by weight. Corinth Wood Pellets shall record in a log the date, time, and duration of any periods when greater than 25% pine is processed and certify that the rotary dryers are operated in series during these periods and that the temperature limit contained in condition (16)E below is not exceeded.
 [06-096 CMR 115, BACT]
- E. The temperature of the drying gases, generated by the wood-fired burners, at the inlet of each rotary dryer shall not exceed 800°F when processing hardwood and softwood species other than pine or a pine mix less than 25% by weight and shall not exceed 650°F when processing all pine or a pine mix greater than 25% by weight. These rotary dryer inlet temperature limits apply at all times the rotary dryers are processing wood, except during periods of startup, shutdown, or malfunction. Compliance with temperature limits shall be based on 30 minute block averages, except that no more than one 30 minute period per day may exceed the limit by an amount of no more than 50°F more than the applicable limit. [06-096 CMR 115, BACT]
- F. Within 60 days of issuance of this license the inlet temperature of each rotary dryer shall be monitored and recorded on a continuous basis. Temperature readings shall be reduced to one minute block averages which shall then be used to determine the 30 minute block average values. A valid one minute

block average shall consist of at least one recorded value each minute and the 30 minute block average shall consist of all one minute averages recorded during each 30 minute period. Each temperature monitoring and recording system shall be installed, operated, maintained, and calibrated in accordance with the manufacturer's recommendations. Corinth Wood Pellets shall maintain a log documenting all maintenance and calibration activities performed on these temperature monitoring and recording systems. Corinth Wood Pellets shall develop a written quality assurance/quality control (QA/QC) Plan, for the Department's review and approval, that specifies the maintenance, calibration, and recordkeeping procedures that will be used to ensure the quality of the data being displayed and recorded. The temperature monitoring and recording systems shall meet the parameter monitor uptime requirements contained in condition (29) below. [06-096 CMR 115, BACT]

G. Visible emissions from either Rotary Dryer cyclone exhaust stack (Stack #1 or #2) shall not exceed 20% opacity on a 6-minute block average basis, except for no more than one 6-minute block average in a 1-hour period. [06-096 CMR 101]

H. Exhaust gases from Burners #1 & #2 shall be directed through the rotary dryers and associated cyclones except during periods of startup, shutdown, or malfunction when the exhaust gases may be diverted through the associated bypass stack. These periods shall be limited to no more than one (1) hour per event. If the startup, shutdown, or malfunction event lasts longer than 1 hour, Corinth Wood Pellets shall either shut the unit down for at least a one hour period or the opacity limit in Condition (16)G above shall apply to the visible emissions from the bypass stack. [06-096 CMR 115, BACT]

The following shall replace Condition (17) of License A-956-71-A-N:

(17) Fugitive Emissions

Visible emissions from fugitive emission sources located at the facility (including fugitive emissions sources associated with any Screening/Pellet Processing Operations, Feed Stock Conveying Systems, fuel/feed stock stockpiles, or roadways) shall not exceed 20 percent opacity, except for no more than five (5) minutes in any 1-hour period. Compliance shall be determined by an aggregate of the individual fifteen (15)-second opacity observations which exceed 20 percent in any one (1) hour. [06-096 CMR 101]

The following shall replace Condition (18) of License A-956-71-A-N:

(18) General Process Sources

Visible emissions from any general process source (including general process sources associated with any Screening/Pellet Processing Operations or any Feed

Stock Conveying Systems) shall not exceed an opacity of 20% on a six (6) minute block average basis, except for no more than one (1) six (6) minute block average in a 1-hour period. [06-096 CMR 101]

NEW CONDITIONS

- (24) Corinth Wood Pellets shall install automatic burner control systems on Burners #1 & #2 that tie fuel feed shut-offs to rotary dryer inlet temperature readings and that tie burner chamber combustion air fan speeds to burner chamber temperature readings. Such automatic burner control systems shall be installed and operational no later than 60 days from the issuance date of this license amendment. [06-096 CMR 115, BACT]
- (25) Corinth Wood Pellets shall install negative draft cyclones to control PM emissions from each of the rotary dryers. The negative draft cyclones shall be installed and operational no later than 120 days from the issuance of this license amendment.
- (26) Corinth Wood Pellets shall complete a more thorough analysis of the technical, energy, economic, and environmental feasibility of installing and operating exhaust gas recycle technology on its wood drying lines. Corinth Wood Pellets shall complete and submit this analysis to the Department no later than 120 days from the issuance date of this license amendment. If, based on its review of this analysis, the Department determines that this technology represents BACT, then Corinth Wood Pellets shall design and install exhaust gas recycle systems on each of its wood drying lines. Such systems shall be fully operational no later than 270 days from the date of the Department's determination that the technology represents BACT. [06-096 CMR 115, BACT]
- (27) If exhaust gas recycle technology is required to be installed by the Department in accordance with condition (25) above, Corinth Wood Pellets shall perform stack testing for PM, NO_x, CO, and VOC emissions from the Rotary Dryer (#1 & #2) cyclone exhaust stacks no later than 90 days after both exhaust gas recycle systems become fully operational. Stack testing shall be conducted in accordance with the *Department of Environmental Protection Bureau of Air Quality Control Air Emission Compliance Test Protocol* and 40 CFR Part 60, Appendix A. [06-096 CMR 115, BACT]
- (28) Corinth Wood Pellets shall install and operate a baghouse to control PM emissions from the hammermill. The baghouse shall be installed and operational no later than 60 days from the issuance of this license amendment.

(29) **Parameter Monitors**

Each parameter monitor must record accurate and reliable data. If the parameter monitor is recording accurate and reliable data less than 98% of the source operating time within any quarter of the calendar year, the Department may initiate enforcement action and may include in that enforcement action any period of time that the parameter monitor was not recording accurate and reliable data during that quarter unless the licensee can demonstrate to the satisfaction of the Department that the failure of the system to record accurate and reliable data was due to the performance of established quality assurance and quality control procedures or unavoidable malfunctions. [06-096 CMR 115, BPT]

(30) Corinth Wood Pellets shall maintain a log documenting maintenance activities performed on the major equipment located at the facility, including the direct wood-fired burners (Burners #1 and #2) and the triple-pass rotary dryers (Rotary Dryers #1 and #2). [06-096 CMR 115, BPT]

(31) Corinth Wood Pellets shall not cause visible emissions (not including water vapor), measured as any opacity totaling twelve minutes or longer in any one hour period, to occur at ground level over any land or surrounding any buildings not owned by Corinth Wood Pellets. Opacity from an unobscured source under this condition shall be determined pursuant to the Environmental Protection Agency's (EPA's) Method 22 - Visual determination of fugitive emissions from material sources and smoke emissions from flares contained in 40 CFR Part 60, Appendix A. [06-096 CMR 115, BPT]

(32) Corinth Wood Pellets shall develop and submit for approval by the Department a best management practice (BMP) plan for the control and minimization of fugitive particulate matter emissions from the facility. The BMP plan shall be developed and submitted to the Department no later than 120 days from the issuance date of this license amendment. Upon the Department's approval of the BMP plan, Corinth Wood Pellets shall adhere to the commitments made in the BMP plan. [06-096 CMR 115, BPT]

(33) Corinth Wood Pellets shall employ and have on-site at least one person who is trained and certified in determining visible emissions in accordance with EPA Test Methods 9 and 22. These certified employees shall have the authority and shall exercise such authority to shut down any process or activity at the facility that is causing or contributing to excess visible emissions. Beginning no later than November 1, 2009 an employee certified in determining visible emissions shall be on-site at all times the facility is operating.

Corinth Wood Pellets, LLC
Penobscot County
Corinth, Maine
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- (34) Corinth Wood Pellets shall perform testing to demonstrate compliance with the PM, CO, NO_x, and VOC emission limits contained in Condition (16)C for the Rotary Dryer (#1 and #2) cyclone exhaust stacks. Such testing shall be conducted for the operating scenarios approved by the Department and in accordance with the *Department of Environmental Protection Bureau of Air Quality Control Air Emission Compliance Test Protocol* and 40 CFR Part 60, Appendix A. All testing shall be completed within 90 days of the new negative draft cyclones becoming fully operational or within 360 days of the issuance date of this license amendment, whichever comes first.

DONE AND DATED IN AUGUSTA, MAINE THIS 24th DAY OF June, 2009.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: James P. Brooks Jr.
DAVID P. LITTELL, COMMISSIONER

The term of this amendment shall be concurrent with the term of Air Emission License A-956-71-A-N.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: September 12, 2008

Date of application acceptance: October 3, 2008

Date filed with the Board of Environmental Protection: _____

This Order prepared by Eric Kennedy, Bureau of Air Quality.

