STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

Moose River Lumber Company, Inc. **Somerset County** **Moose River, Maine** **A-779-77-3-A**	**Departmental** **Findings of Fact and Order** **New Source Review** **NSR #3**

FINDINGS OF FACT

After review of the air emission license amendment application, staff investigation reports, and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes (M.R.S.) § 344 and § 590, the Maine Department of Environmental Protection (the Department) finds the following facts:

I. REGISTRATION

A. Introduction

FACILITY	Moose River Lumber Company, Inc.
LICENSE TYPE	06-096 C.M.R. ch. 115, Minor Modification
NAICS CODES	321113
NATURE OF BUSINESS	Lumber and Wood Products Manufacturer
FACILITY LOCATION	25 Tapley Road, Moose River, Maine

B. NSR License Description

Moose River Lumber Company, Inc. (MRL) has requested a New Source Review (NSR) license in order to:

1. Amend and replace NSR #2 (A-779-77-2-A issued November 30, 2017) addressing the installation of two new lumber kilns;
2. Reestablish the facility's kiln throughput limit;
3. Remove the capacity restriction on Boiler #1 when Boiler #4 is operating; and
4. Reestablish PM_{10} emission limits for Boilers #1 and #4 to include condensables and add emission limits for $PM_{2.5}$.

C. Emission Equipment

The following new equipment is addressed in this NSR License:

Process Equipment

Equipment	Maximum Production Rate	Installation Date	Pollution Control Equipment
Kiln #4*	32 MMBF/year	2017	none
Kiln #5	100 MMBF/year	2019	none

*Note: Although Kiln #4 is an existing unit, this NSR license effectively replaces NSR #2. Therefore, Kiln #4 is treated as if it were new equipment.

The following existing emission units are affected, but not modified, by this project:

Fuel Burning Equipment

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate (ton/hr)	Fuel Type, % moisture	Manuf. Date	Install. Date	Stack #
Boiler #1	15.3	1.0	Biomass, 15%	1988	1988	1
Boiler #4	29.4	2.2	Biomass, 25%	2008	2008	4

Process Equipment

Equipment	Maximum Production Rate	Installation Date	Pollution Control Equipment
Kilns #1, #2, & #3	98 MMBF/year (combined)	1988	none

D. Definitions

Biomass means any biomass-based solid fuel that is not a solid waste. This includes, but is not limited to, wood residue; wood products (*e.g.,* trees, tree stumps, tree limbs, bark, lumber, sawdust, sander dust, chips, scraps, slabs, millings, and shavings); animal manure, including litter and other bedding materials; vegetative agricultural and silvicultural materials, such as logging residues (slash), nut and grain hulls and chaff (*e.g.,* almond, walnut, peanut, rice, and wheat), bagasse, orchard prunings, corn stalks, coffee bean hulls and grounds. This definition also includes wood chips and processed pellets made from wood or other forest residues. Inclusion in this definition does not constitute a

determination that the material is not considered a solid waste. MRL should consult with the Department before adding any new biomass type to its fuel mix.

E. Project Description

MRL currently operates four lumber drying kilns (Kilns #1, #2, #3, and #4). Kilns #1, #2, and #3 were installed in 1988 and have a maximum combined throughput capacity of 98 million board feet per year (MMBF/year).

Kiln #4 was licensed and installed in 2017 (NSR #2). This licensing action also included installation of another batch lumber kiln named Kiln #5. This kiln was never installed.

MRL has proposed the installation of a new continuous feed drying kiln, also to be named Kiln #5. The facility has requested amending NSR #2 to change the previously licensed Kiln #5 from a batch kiln to a continuous feed kiln and to reestablish a new kiln throughput limit for the facility based on a revised analysis of the emission increase.

Additionally, MRL has proposed removing the capacity restriction on Boiler #1. Currently, Boiler #1 is restricted to operating at no more than 20% of its maximum capacity on a 24-hour average basis whenever Boiler #4 is also operating. This restriction was put in place based on the results of an ambient air quality analysis performed in 2008. MRL has performed additional modeling to demonstrate ambient air quality standards can be met with both Boilers #1 and #4 operating at full capacity simultaneously.

F. Application Classification

All rules, regulations, or statutes referenced in this air emission license refer to the amended version in effect as of the issued date of this license.

The application for MRL does not violate any applicable federal or state requirements and does not reduce monitoring, reporting, testing, or recordkeeping requirements.

The modification of a major source is considered a major or minor modification based on whether or not expected emissions increases exceed the "Significant Emission Increase" levels as given in *Definitions Regulation*, 06-096 Code of Maine Rules (C.M.R.) ch. 100. For a major stationary source, the expected emissions increase from each new, modified, or affected unit may be calculated as equal to the difference between the post-modification projected actual emissions and the baseline actual emissions for each NSR regulated pollutant.

1. Baseline Actual Emissions

Baseline actual emissions (BAE) are equal to the average annual emissions from any consecutive 24-month period within the ten years prior to submittal of a complete license application. Since MRL is re-licensing the change addressed in NSR #2, the baseline period must be for a period prior to Kiln #4 coming online. Kiln #4 came online in late December 2017, and MRL has proposed using calendar years 2016-2017 (excluding any emissions from Kiln #4) as the 24-month baseline period from which to determine baseline actual emissions for all pollutants for emission units affected as part of this project. Baseline actual emissions for new equipment are considered to be zero for all pollutants.

Baseline emissions for the kilns were calculated using the reported kiln throughput in the baseline period and an emission factor developed by the University of Maine[1] of 1.283 pounds of VOC for every 1,000 board feet dried (lb/MBF).

Baseline emissions for the boilers were calculated using the reported fuel use and moisture content for each boiler in the baseline period and the licensed emission limit for each pollutant except PM_{10} and $PM_{2.5}$. The emission factors for PM_{10} and $PM_{2.5}$ were developed by prorating the total particulate matter emission limit (0.30 lb/MMBtu) to account for the actual size distribution as established in EPA's Compilation of Air Pollutant Emission Factors (AP-42), Table 1.6-5 dated 9/03. Emissions of PM_{10} were determined to represent 91% of the total particulate matter emissions and $PM_{2.5}$ to represent 54%. Once the filterable portion of each emission factor was determined, an additional 0.017 lb/MMBtu was added to account for condensable particulate emissions (per AP-42 Table 1.6-1), resulting in emission factors of 0.29 lb/MMBtu for PM_{10} and 0.179 lb/MMBtu for $PM_{2.5}$.

The results of this baseline analysis are presented in the table below.

Baseline Actual Emissions (2016 - 2017 Average)

Equipment	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)
Boiler #1	2.47	2.39	1.48	0.21	4.04	4.94	0.32
Boiler #4	26.67	25.78	15.91	2.22	30.23	53.34	1.51
Kilns #1 - #3 (combined)	–	–	–	–	–	–	46.47
Total	**29.14**	**28.17**	**17.39**	**2.43**	**34.27**	**58.28**	**48.30**

[1] R.W. Rice and L Zibilske, "Estimated VOC Losses During the Drying of Five Northeastern Species," Forest Products Journal 49, no. 11/12 (1999)

2. Projected Actual Emissions

Projected actual emissions (PAE) are the maximum actual annual emissions anticipated to occur in any one of the five years (12-month periods) following the date existing units resume regular operation after the project or any one 12-month period in the ten years following if the project involves increasing the unit's design capacity or its potential to emit of a regulated pollutant.

New emission units must use potential to emit emissions for projected actual emissions. This project includes the installation of new kilns. MRL has proposed a federally enforceable limit restricting the kilns to a throughput of 150 MMBF/year. Therefore, PAE for the kilns is based on total potential emissions from drying 150 MMBF/year.

Affected equipment includes any new or physically modified equipment as well as upstream or downstream activities such as the increased use of Boilers #1 and #4. MRL has proposed a federally enforceable limit restricting the total boiler fuel use to 25,000 ton/year. Boiler #1 fires a slightly dryer fuel mixture than Boiler #4 resulting in higher emissions per ton of wood fired. Therefore, PAE for the boilers has been based on firing Boiler #1 at 100% capacity for 8,760 hours/year and any remaining fuel being fired in Boiler #4. This results in a conservatively high PAE for the boilers.

Projected actual emissions from the affected equipment are shown below.

Projected Actual Emissions

Equipment	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)
Boilers #1 & #4 (combined)	52.77	51.01	31.49	4.40	69.86	105.54	4.46
Kilns #1 - #5 (combined)	–	–	–	–	–	–	96.23
Total	**52.77**	**51.01**	**31.49**	**4.40**	**69.86**	**105.54**	**100.69**

3. Emission Adjustments

In determining projected actual emissions, MRL excluded increases in emissions that the existing equipment could have accommodated during the baseline period and are unrelated to the current project. This is known as the Demand Growth Exclusion.

To determine how much of the emissions increases are attributable to the project versus market demand, MRL looked at what emissions would have been produced if additional orders for lumber had been received.

In the baseline period, MRL dried an average of 72.4 MMBF/year of lumber. MRL was licensed to dry up to 98 MMBF/year which Kilns #1 - #3 are capable of accommodating.

To dry this additional lumber, the boilers would have needed to provide additional heat to the kilns. However, the additional heat required is not a linear relationship. The kilns have a certain amount of fixed heat load needed to operate, regardless of the amount of lumber loaded into the kiln. This fixed load includes the heat required to initially heat the fixed volume of the kilns and building envelope losses. The kilns also have a variable heat load dependent on the amount of lumber loaded into the kiln. Drying additional lumber involves supplying more heat to warm up and evaporate the water in the lumber. Based on information found in the 1991 edition of Dry Kiln Operators Manual[2] and a 2012 Drying Technology article[3], it has been estimated that 84% of the heat required to operate a kiln is variable.

To determine likely boiler emissions from drying 98 MMBF/year of lumber, MRL calculated a fuel factor for each boiler that represented the amount of fuel consumed per MMBF dried in the baseline period. MRL then assumed any additional lumber could have been dried using only the variable heat load, i.e., fuel factor that was 84% of the original. Using this methodology in order to dry 98 MMBF/year, MRL would have fired an additional 318.0 tpy of fuel in Boiler #1 and 3,918.8 tpy of fuel in Boiler #4. This additional fuel use could have been accommodated under the facility's existing air emission license.

Based on the analysis outlined above, the following emissions are excludable under the Demand Grown Exclusion:

Demand Growth Exclusion Emissions Adjustments

Equipment	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)
Boiler #1	0.73	0.71	0.44	0.06	1.19	1.46	0.09
Boiler #4	7.88	7.62	4.70	0.66	8.93	15.77	0.45
Kilns #1 - #3 (combined)	–	–	–	–	–	–	16.40
Total	**8.61**	**8.33**	**5.14**	**0.72**	**10.12**	**17.23**	**16.94**

[2] Simpson, William T., ed. *Dry Kiln Operators Manual*. Madison, WI: U.S. Dep. of Agriculture, 1991, Chapter 11, Fig. 11-2

[3] "Energy Consumption in Industrial Drying of Radiata Pine." *Drying Technology*, vol. 30, no. 7, 2012, pp. 774–779

4. Emissions Increases

Emissions increases are calculated by subtracting BAE and excludable emissions from the PAE. The emission increase is then compared to the significant emissions increase levels.

Pollutant	Baseline Actual Emissions 2016-2017 (ton/year)	Projected Actual Emissions (ton/year)	Excludable Emissions (ton/year)	Emissions Increase (ton/year)	Significant Emissions Increase Levels (ton/year)
PM	29.14	52.77	8.61	15.03	25
PM_{10}	28.17	51.01	8.33	14.52	15
$PM_{2.5}$	17.39	31.49	5.14	8.97	10
SO_2	2.43	4.40	0.72	1.26	40
NO_x	34.27	69.86	10.12	24.47	40
CO	58.28	105.54	17.23	30.03	100
VOC	48.30	100.69	16.94	35.45	40

5. Classification

Since emissions increases do not exceed significant emissions increase levels, this NSR license is determined to be a minor modification under *Minor and Major Source Air Emission License Regulations,* 06-096 C.M.R. ch. 115. An application to incorporate the requirements of this NSR license into the Part 70 air emission license has been submitted to the Department.

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 C.M.R. ch. 100. 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 06-096 C.M.R. ch. 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

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

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

B. Kilns #4 and #5

In NSR #2, MRL licensed the installation of two new batch lumber kilns (Kilns #4 and #5) each with a throughput capacity of 32 MMBF/year. In order for the project to stay below significant emissions increase levels, Kilns #4 and #5 were limited to a combined annual throughput of 33.5 MMBF/year on a 12-month rolling total basis.

Construction on Kiln #5 was not started within 18 months of issuance of NSR #2. MRL has requested an extension to construct this equipment. Additionally, MRL has proposed the amendment of NSR #2 to redefine the project in the following ways:

- Changing Kiln #5 from a batch kiln to a continuous kiln with a throughput capacity of up to 100 MMBF/year; and
- Instead of limiting the annual throughput of Kilns #4 and #5 separate from the other kilns, increasing the facility-wide throughput limit to 150.0 MMBF/year.

The only criteria pollutant emitted from the kilns is VOC which is driven out of the wood during the drying process. MRL predominantly dries spruce and fir. Emissions from the kilns were calculated based on an emission factor developed by the University of Maine[4] of 1.283 pounds of VOC for every 1,000 board feet dried.

Add-on controls for emissions of VOC from the kilns, including thermal oxidizers and scrubbers, are not economically feasible because of the low pollutant concentration, the high moisture content, and the high volume of the vent exhaust gases.

In order to limit emissions increases from this project to below significant emissions increase levels, MRL has proposed an annual throughput limit for Kilns #1 – #5 of 150.0 MMBF per year (all kilns combined). Therefore, BACT for VOC emissions from Kilns #1 – #5 shall be a combined throughput limit of 150.0 MMBF per year based on a 12-month rolling total. Compliance shall be demonstrated by monthly and 12-month rolling total records of the board feet of lumber dried in Kilns #1 – #5.

[4] R.W. Rice and L Zibilske, "Estimated VOC Losses During the Drying of Five Northeastern Species," Forest Products Journal 49, no. 11/12 (1999)

C. Boilers #1 and #4

1. Capacity Restriction

Boiler #1 currently has a 20% capacity restriction during periods of time when Boiler #4 is in operation. This restriction was put in place based on screening level air dispersion modeling performed in 2008. With installation of Kilns #4 and #5 and the corresponding increase in the facility-wide kiln throughput, MRL has proposed removing the capacity restriction on Boiler #1.

MRL has submitted an air dispersion modeling analysis demonstrating that emissions from the facility, in conjunction with all other sources, do not violate ambient air quality standards when the capacity restriction is removed.

2. Particulate Emission Limits

A previous BACT analysis for Boilers #1 and #4 established PM_{10} lb/MMBtu emission limits equal to that used for PM. However, this limit did not include condensable particulate. Since the definition of PM_{10} now includes condensable emissions, the PM_{10} emission limits have been adjusted accordingly as described below under the authority of BPT. These changes result in lower PM_{10} limits than previously licensed. Additionally, $PM_{2.5}$ limits have been added.

Emission limits for PM_{10} and $PM_{2.5}$ were calculated by taking the filterable PM emission limit (0.30 lb/MMBtu), prorating it by the fraction of total particulate that is PM_{10} or $PM_{2.5}$ (as applicable), and adding 0.017 lb/MMBtu for the condensable portion. The fraction of filterable PM which is PM_{10} is 91% and the fraction of filterable PM which is $PM_{2.5}$ is 54% based on the cumulative particle size distribution listed in AP-42, Table 1.6-5 dated 9/03. The condensable particulate emission rate was based on AP-42 Table 1.6-1 dated 9/03.

Therefore, based on the inclusion of condensable particulate, the following emission limits are determined to be BPT for PM_{10} and $PM_{2.5}$ from Boilers #1 and #4:

Equipment	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)
Boiler #1	4.44	2.74
Boiler #4	8.53	5.26

Compliance shall be demonstrated in accordance with appropriate test methods upon request by the Department.

3. Annual Fuel Limit

In order to limit emissions increases from this project to below significant emissions increase levels, MRL has proposed an annual fuel limit for Boilers #1 and #4 of 25,000 ton/year (both boilers combined).

The fuel mixes fired in each boiler have different moisture contents resulting in a different heat content per ton of fuel. The highest annual emissions would occur from firing Boiler #1 at 100% capacity for 8,760 hours/year and firing the remaining fuel in Boiler #4. Although this scenario is unlikely to occur, it has been conservatively used to calculate the facility's future potential to emit.

Therefore, BPT for Boilers #1 and #4 shall include a combined annual fuel limit of 25,000 ton/year based on a 12-month rolling total basis. Compliance shall be demonstrated through monthly and 12-month rolling total records of fuel use.

D. HAP Emissions

1. Kilns

Emission factors for HAPs from the drying of lumber are included in the *Handbook of Substance-Specific Information of National Pollutant Release Inventory Reporting*, also known as the "NPRI Handbook," issued by the National Council for Air and Stream Improvement (NCASI). The NPRI Handbook is designed to assist NCASI's Canadian members with reporting requirements under Environment Canada's NPRI program which is similar to EPA's Toxics Release Inventory (TRI) reporting program. Additionally, Environment Canada publishes these same emission factors on their website for use in emissions reporting.

The NPRI Handbook provided emissions data for white spruce and black spruce. To establish appropriate emission factors for the predominant wood species processed at MRL (red spruce and fir), the average of the data for white and black spruce was used. This is consistent with the methodology used for other similar facilities within the state.

2. Boilers

HAP emissions from the boilers were based on emission factors found in NCASI's *Technical Bulletin No. 1013: A Comprehensive Compilation and Review of Wood-Fired Boiler Emissions*, published March 2013.

3. Total HAP Emissions

Based on the emission factors outlined above, a fuel limit of 25,000 ton/year for the boilers, and a kiln throughput limit of 150.0 MMBF/year, MRL will be limited to a maximum single HAP emission of less than 9.9 tpy and total HAP emissions of less than 24.9 tpy.

E. Incorporation Into the Part 70 Air Emission License

Per *Part 70 Air Emission License Regulations*, 06-096 C.M.R. ch. 140 § 1(C)(8), for a modification at the facility that has undergone NSR requirements or been processed through 06-096 C.M.R. ch. 115, the source must apply for an amendment to their Part 70 license within one year of commencing the proposed operations, as provided in 40 C.F.R. Part 70.5. An application to incorporate the requirements of this NSR license into the Part 70 air emission license has been submitted to the Department.

F. Annual Emissions

MRL shall be restricted to the following annual emissions, based on a 12-month rolling total. The tons per year limits were calculated based on the following:

- A fuel limit of 25,000 ton/year for both boilers combined, emissions based on firing Boiler #1 at 100% for 8,760 hours/year and firing the remaining fuel in Boiler #4;
- Operating Generator #1 for 100 hours/year; and
- A facility-wide kiln throughput limit of 150.0 MMBF/year.

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

	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	VOC
Boilers #1 & #4	52.8	51.0	31.5	4.4	69.9	105.5	4.5
Generator #1	–	–	–	–	0.4	0.1	–
Kilns #1 - #5	–	–	–	–	–	–	96.2
Total TPY	**52.8**	**51.0**	**31.5**	**4.4**	**70.3**	**105.6**	**100.7**

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

III. AMBIENT AIR QUALITY ANALYSIS

A. Overview

A refined dispersion modeling analysis was performed to demonstrate that emissions from MRL, in conjunction with other sources, will not cause or contribute to violations of National Ambient Air Quality Standards (NAAQS) for SO_2, PM_{10}, $PM_{2.5}$, NO_2 or CO or to Class II increments for SO_2, PM_{10}, $PM_{2.5}$ or NO_2.

Since the current licensing action is classified as a minor modification, it has been determined by MEDEP-BAQ that an assessment of Class I Air Quality Related Values (AQRVs) is not required.

B. Model Inputs

The AERMOD-PRIME dispersion model was used to address NAAQS and increment impacts in all areas. The modeling analysis accounted for the potential of building wake and cavity effects on emissions from all modeled stacks that are below their calculated formula GEP stack heights.

All modeling was performed in accordance with all applicable requirements of the Maine Department of Environmental Protection, Bureau of Air Quality (MEDEP-BAQ) and the United States Environmental Protection Agency (USEPA). The most-recent regulatory version of the AERMOD-PRIME model and its associated processors were used to conduct the analyses.

A valid five-year hourly off-site meteorological database was used in the AERMOD refined modeling analysis. ASOS wind data was collected at height of 10 meters at the Berlin New Hampshire NWS meteorological monitoring site during the period of 2013 - 2017. The following parameters and their associated heights were as follows:

TABLE III-1 : Meteorological Parameters and Collection Heights

Parameter	Sensor Height(s)
Scalar Wind Speed	10 meters
Scalar Wind Direction	10 meters
Temperature	2 meters

Each year of meteorological data met the 90% data recovery requirement, both singularly and jointly.

All missing data were interpolated or coded as missing, per USEPA guidance.

The surface meteorological data was combined with concurrent hourly cloud cover and upper-air data obtained from the Caribou National Weather Service (NWS). Missing cloud

cover and/or upper-air data values were interpolated or coded as missing, per USEPA guidance.

All necessary representative micrometeorological surface variables for inclusion into AERMET (surface roughness, Bowen ratio and albedo) were calculated using the AERSURFACE utility program and from procedures recommended by USEPA.

Point-source parameters, used in the modeling for MRL, are listed in Table III-2.

TABLE III-2 : MRL Point Source Stack Parameters

Stack	Stack Base Elevation (m)	Stack Height (m)	GEP Stack Height (m)	Stack Diameter (m)	UTM Easting NAD83 (m)	UTM Northing NAD83 (m)
CURRENT						
• Boiler #1 Stack	365.20	21.34	38.68	0.60	402,561	5,055,453
• Boiler #4 Stack	364.47	21.95	30.47	0.75	402,592	5,055,485
2010 BASELINE ($PM_{2.5}$ INCREMENT)						
• Boiler #4 Stack	364.47	21.95	30.47	0.75	402,592	5,055,485
• MRL conservatively assumed no baseline credit for Boiler #1, which served primarily as a back-up to Boiler #4						
1987 BASELINE (NO_2 INCREMENT)						
• MRL conservatively assumed no credit for MRL sources that existed in the 1987 baseline year.						
1977 BASELINE (SO_2/PM_{10} INCREMENT)						
• No MRL sources existed in the 1977 baseline year; no baseline credits to be taken.						

Emission parameters for NAAQS and increment modeling are listed in Table III-3. Modeling was performed for three load cases, which represent various operational scenarios for MRL.

For the purpose of determining maximum predicted impacts, the following assumptions were used:

- All NO_x emissions were conservatively assumed to convert to NO_2 (USEPA Tier I Method).
- All particulate emissions were conservatively assumed to convert to PM_{10} and $PM_{2.5}$.

TABLE III-3 : Stack Emission Parameters

Stack	Averaging Periods	SO_2 (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	NO_x (g/s)	CO (g/s)	Stack Temp (K)	Stack Velocity (m/s)
MAXIMUM LICENSE ALLOWED								
• Boiler #1 Stack	All	0.05	0.61	0.33	0.95	1.16	491.48	10.09
• Boiler #4 Stack	All	0.09	1.17	0.63	1.26	2.22	533.15	17.19
2012 BASELINE ($PM_{2.5}$ INCREMENT)								
• Boiler #4 Stack	24-Hour	-	-	0.55	-	-	533.15	12.89
• MRL conservatively assumed no baseline credit to be used for the annual $PM_{2.5}$ averaging period.								
1987 BASELINE (NO_2 INCREMENT)								
• MRL conservatively assumed no credit for MRL sources that existed in the 1987 baseline year.								
1977 BASELINE (SO_2/PM_{10} INCREMENT)								
• No MRL sources existed in the 1977 baseline year; no baseline credits to be taken.								

C. Single Source Modeling Impacts

The significant impact model results for MRL are shown in Table III-4. Maximum predicted impacts that exceed their respective significance level are indicated in boldface type. For comparison to the Class II significance levels, the impacts for 24-hour $PM_{2.5}$, annual $PM_{2.5}$ and 1-hour NO_2 were conservatively based on the maximum High-1st-High predicted values, averaged over five-years of meteorological data. All other pollutants/averaging periods were conservatively based on their maximum High-1st-High predicted values. No additional modeling was required for pollutants that did not exceed their respective significance levels.

TABLE III-4 : Maximum AERMOD-PRIME Significant Impact Results from MRL

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (m)	Receptor UTM N (m)	Receptor Elevation (m)	Class II Significance Level ($\mu g/m^3$)	Load Case
SO_2	1-hour	6.39	402,019	5,057,405	415.51	7.9	Maximum
	3-hour	3.82	401,819	5,056,805	415.73	25	Maximum
	24-hour	1.99	402,734	5,055,230	364.18	5	Maximum
	Annual	0.17	402,794	5,055,320	364.07	1	Maximum
PM_{10}	24-hour	**26.75**	402,734	5,055,230	364.18	5	Maximum
	Annual	**2.25**	402754	5,055,390	361.59	1	Maximum
$PM_{2.5}$	24-hour	**8.20**	402,444	5,055,700	369.13	1.2	Maximum
	Annual	**0.99**	402,794	5,055,320	364.07	0.3	Maximum
NO_2	1-hour	**98.05**	402,019	5,057,405	415.51	7.5	Maximum
	Annual	**2.70**	402,764	5,055,360	361.17	1	Maximum
CO	1-hour	153.30	404,319	5,056,905	422.17	2,000	Maximum
	8-hour	54.70	402,019	5,057,405	415.51	500	Maximum

D. Combined Source Modeling Impacts

As indicated in boldface type in Table III-4, other sources not explicitly included in the modeling analysis must be accounted for by using representative background concentrations for the surrounding area.

Background concentrations, listed in Table III-5, are derived from representative rural background data for use in the Central Maine region.

TABLE III-5 : Background Concentrations

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)
PM_{10}	24-hour	47
	Annual	11
$PM_{2.5}$	24-hour	17
	Annual	5
NO_2	1-hour	43
	Annual	4

MEDEP examined other nearby sources to determine if any impacts would be significant in or near MRL's significant impact area. Due to the MRL's location and extent of the predicted significant impact area, MEDEP has determined that no other sources would be included in combined-source modeling.

The maximum modeled impacts, which were explicitly normalized to the form of their respective NAAQS, were added with conservative rural background concentrations to demonstrate compliance with NAAQS, as shown in Table III-6.

Because all pollutant/averaging period impacts using this method meet NAAQS, no further NAAQS modeling analyses need to be performed.

TABLE III-6 : Maximum Combined Source Impacts ($\mu g/m^3$)

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (m)	Receptor UTM N (m)	Receptor Elevation (m)	Back-Ground ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
PM_{10}	24-hour	19.63	402,454	5,055,630	369.08	47	66.63	150
	Annual	2.08	402,754	5,055,390	361.59	11	13.08	50
$PM_{2.5}$	24-hour	5.11	402,464	5,055,700	369.00	17	22.11	35
	Annual	0.99	402,794	5,055,320	364.07	5	5.99	15
NO_2	1-hour	82.97	402,019	5,057,405	415.51	43	125.97	188
	Annual	2.70	402,764	5,055,360	361.17	4	6.70	100

E. Class II Increment

The AERMOD-PRIME model was also used to predict maximum Class II increment impacts.

Results of the Class II increment analysis are shown in Table III-7. All modeled maximum increment impacts were below increment standards for all averaging periods. Because all predicted increment impacts meet increment standards, no additional Class II SO_2, PM_{10}, $PM_{2.5}$ and NO_2 increment modeling needed to be performed.

TABLE III-7 : Class II Increment Consumption

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (m)	Receptor UTM N (m)	Receptor Elevation (m)	Class II Increment ($\mu g/m^3$)
SO_2	3-hour	3.82	401,819	5,056,805	415.73	512
	24-hour	1.99	402,734	5,055,230	364.18	91
	Annual	0.17	402,794	5,055,320	364.07	20
PM_{10}	24-hour	19.63	402,454	5,055,630	369.08	30
	Annual	2.25	402,754	5,055,390	361.59	17
$PM_{2.5}$	24-hour	4.49	402,444	5,055,630	368.55	9
	Annual	1.08	402,804	5,055,320	363.75	4
NO_2	Annual	2.70	402,764	5,055,360	361.17	25

F. Summary

In summary, it has been demonstrated that MRL will not cause or contribute to a violation of any SO_2, PM_{10}, $PM_{2.5}$, NO_2 or CO NAAQS or to an exceedance of Class II increments for SO_2, PM_{10}, $PM_{2.5}$ or NO_2.

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 New Source Review License A-779-77-3-A pursuant to the preconstruction licensing requirements of 06-096 C.M.R. ch. 115 and subject to the special conditions below.

Severability. The invalidity or unenforceability of any provision of this License or part thereof 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 All Specific Conditions of Air Emission Licenses A-779-77-1-A, A-779-77-2-A, and any previously issued NSR licenses. All Specific Conditions are being replaced both to address changes to the boilers and kilns and to remove obsolete Conditions. Where emission limits or requirements have been set by a previous licensing action, references to the originating license are provided.

(1) Boilers #1 and #4

A. Boilers #1 and #4 are licensed to fire biomass.
[06-096 C.M.R. ch. 115, BACT (A-779-77-1-A)]

B. Boilers #1 and #4 shall not exceed a combined annual fuel usage of 25,000 ton/year (12-month rolling total basis) of biomass. MRL shall keep records of fuel usage in each boiler on a monthly and 12-month rolling total basis. [06-096 C.M.R. ch. 115, BPT]

C. Emission Limits

1. Emissions from Boiler #1 shall not exceed the following limits:

Pollutant	lb/MMBtu	Origin and Authority	Enforceability
PM	0.30	06-096 C.M.R. ch. 103, § 2(B)(4)(a)	**Federally Enforceable**

Pollutant	lb/hr	Origin and Authority	Enforceability
PM	4.59	06-096 C.M.R. ch. 115, BACT (A-779-77-1-A)	**Federally Enforceable**
PM_{10}	4.44	06-096 C.M.R. ch. 115, BPT	**Federally Enforceable**
$PM_{2.5}$	2.74	06-096 C.M.R. ch. 115, BPT	**Federally Enforceable**
SO_2	0.38	06-096 C.M.R. ch. 115, BACT (A-779-77-1-A)	**Federally Enforceable**
NO_x	7.50	06-096 C.M.R. ch. 115, BACT (A-779-77-1-A)	**Federally Enforceable**
CO	9.18	06-096 C.M.R. ch. 115, BACT (A-779-77-1-A)	**Federally Enforceable**
VOC	2.61	06-096 C.M.R. ch. 115, BACT (A-779-77-1-A)	**Federally Enforceable**

2. Emissions from Boiler #4 shall not exceed the following limits:

Pollutant	lb/MMBtu	Origin and Authority	Enforceability
PM	0.30	06-096 C.M.R. ch. 103, § 2(B)(4)(a)	**Federally Enforceable**

Pollutant	lb/hr	Origin and Authority	Enforceability
PM	8.82	06-096 C.M.R. ch. 115, BACT (A-779-77-1-A)	**Federally Enforceable**
PM_{10}	8.53	06-096 C.M.R. ch. 115, BPT	**Federally Enforceable**
$PM_{2.5}$	5.26	06-096 C.M.R. ch. 115, BPT	**Federally Enforceable**
SO_2	0.73	06-096 C.M.R. ch. 115, BACT (A-779-77-1-A)	**Federally Enforceable**
NO_x	9.99	06-096 C.M.R. ch. 115, BACT (A-779-77-1-A)	**Federally Enforceable**
CO	17.63	06-096 C.M.R. ch. 115, BACT (A-779-77-1-A)	**Federally Enforceable**
VOC	0.50	06-096 C.M.R. ch. 115, BACT (A-779-77-1-A)	**Federally Enforceable**

3. Visible emissions from Boilers #1 and #4 shall each not exceed 30% opacity on a six (6) minute block average basis, except for periods of startup, shutdown, and malfunction during which time MRL may elect to demonstrate compliance by complying with all of the following work practice standards in lieu of the numerical opacity standard.

   a. MRL shall maintain a log (written or electronic) of the date, time, and duration of all operating time, startups, shutdowns, and malfunctions for each boiler (Boilers #1 and #4).

   b. MRL shall develop and implement a written startup and shutdown plan for Boilers #1 and #4.

   c. The duration of startups, shutdowns, or malfunctions shall not exceed one hour per occurrence.

   d. Boilers #1 and #4 shall be operated at all times in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Department that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the unit.

   [06-096 C.M.R. ch. 115, BPT]

D. Control Equipment

1. MRL shall control particulate matter emissions from Boiler #1 by use of a cyclone with fly ash re-injection. [06-096 C.M.R. ch. 115, BPT]
2. MRL shall inspect the cyclone at least once per month. [06-096 C.M.R. ch. 115, BPT]
3. MRL shall control particulate matter emissions from Boiler #4 by use of two multiclones in series with fly ash re-injection. [06-096 C.M.R. ch. 115, BPT]
4. MRL shall inspect the multiclones at least once per month. [06-096 C.M.R. ch. 115, BPT]

E. Emission Limit Compliance Methods

Compliance with the emission limits for Boilers #1 and #4 shall be demonstrated in accordance with appropriate test methods upon request by the Department. [06-096 C.M.R. ch. 115, BPT]

F. Periodic Monitoring

MRL shall monitor and record the following periodic monitors for Boilers #1 and #4 and their associated air pollution control equipment:

1. Tons of wood fired in Boilers #1 and #4 (each) on a monthly and 12-month rolling total basis based on auger rotations. [40 C.F.R. § 60.48c(g)(2) and 06-096 C.M.R. ch. 115, BPT]
2. Records of all cyclone monthly inspections and any maintenance activities performed. [06-096 C.M.R. ch. 115, BPT]
3. Records of all multiclone monthly inspections and any maintenance activities performed. [06-096 C.M.R. ch. 115, BPT]

(2) Drying Kilns

A. MRL shall be limited to drying a total of 150,000,000 BF (150.0 MMBF) of lumber per year in the facility's drying kilns based on a 12-month rolling total. [06-096 C.M.R. ch. 115, BACT]

B. MRL shall maintain records indicating the quantity of wood dried (in BF) and VOC emissions. VOC emissions shall be calculated using an emission factor of 1.283 pounds of VOC per 1,000 BF. The kiln records shall be maintained on a monthly and a 12-month rolling total basis. [06-096 C.M.R. ch. 115, BPT]

C. Prior to drying any species of wood other than spruce and fir in the kilns, MRL shall contact the Department for approval of an alternative emission factor appropriate for the species the facility intends to dry. [06-096 C.M.R. ch. 115, BPT]

(3) Wood Chip and Wood Dust Handling System

A. Visible emissions from the wood chip and wood dust handling systems, including the wood chip and sawdust transfer systems (blower systems and conveyor systems), the dust cyclone, and chip and dust collection buildings and silo, shall not exceed an opacity of 20% on a 6-minute block average basis. [06-096 C.M.R. ch. 115, BPT]

B. MRL shall establish a system of maintenance, inspection and repair for the wood chip and wood dust handling system, which shall include a monthly inspection of the system. [06-096 C.M.R. ch. 115, BPT]

C. Periodic Monitoring

MRL shall monitor and record the following periodic monitors for the wood chip and wood dust handling system:

1. Records of monthly inspections of the wood chip and wood dust handling system. [06-096 C.M.R. ch. 115, BPT]
2. Records of all wood chip and wood dust handling system maintenance activities. [06-096 C.M.R. ch. 115, BPT]

DONE AND DATED IN AUGUSTA, MAINE THIS 9th DAY OF July , 2019.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____ for
GERALD D. REID, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 12/27/18
Date of application acceptance: 1/3/19

Date filed with the Board of Environmental Protection:

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

Filed
JUL 09 2019
State of Maine
Board of Environmental Protection