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

DEPARTMENT ORDER

Irving Forest Products, Inc. **Aroostook County** **Nashville Plantation, Maine** **A-314-77-3-A**	**Departmental** **Findings of Fact and Order** **New Source Review** **NSR #3**

FINDINGS OF FACT

After review of the air emission license 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	Irving Forest Products, Inc. (Irving) – Ashland Sawmill
LICENSE TYPE	06-096 C.M.R. ch. 115, Minor Modification
NAICS CODES	321912 (cutstock, resawing, planing), 321113 (sawmill), 321999 (misc. wood product mfg.)
NATURE OF BUSINESS	Wood Products
FACILITY LOCATION	1218 Portage Road, Nashville Plantation, Maine 04732

B. NSR License Description

Irving Forest Products, Inc. (Irving) has requested a New Source Review (NSR) license to install a new biomass fired boiler and a new lumber drying kiln and to increase their VOC limit for the kiln drying of lumber from 83.4 tons/year of VOC to 93.0 tons/year of VOC.

C. Emission Equipment

The following equipment is addressed in this NSR license:

Fuel Burning Equipment

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate (tons/hr)	Fuel Type, % sulfur	Stack #
Boiler #6	23	2.6*	biomass, negl.	6

*At 4,500 Btu/lb and 50% moisture

Process Equipment

Equipment	Production Rate	Pollution Control Equipment	Stack #
Lumber Drying Kiln (new)	45 MMBF/year	-	Fugitive

In this license, Lumber Drying Kiln shall refer to the *new* Lumber Drying Kiln to be installed, *not* the two existing Lumber Drying Kilns, unless stated otherwise.

The following equipment is affected by this NSR license:

Fuel Burning Equipment

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate (tons/hr)	Fuel Type, % sulfur	Stack #
Boiler #4	25.7 [each]	2.9*	biomass, negl.	4
Boiler #5				5

*At 4,500 Btu/lb and 50% moisture

Process Equipment

Equipment	Production Rate	Pollution Control Equipment	Stack #
Lumber Drying Kilns (2)	130 MMBF/year	-	Fugitive

The installation of Boilers #4 and #5 and the two *existing* Lumber Drying Kilns were addressed in NSR license A-314-77-1-A (NSR #1, issued October 25, 2013). As required in NSR license A-314-77-1-A (issued October 25, 2013), Irving was required to submit an application to incorporate NSR #1 into their Part 70 air emission license no later than 12 months from commencement of the requested operation. This application was received by the Department on July 10, 2015, and is currently being addressed as part of the facility's Part 70 air emission license renewal.

D. Definitions

Seasonal Boiler. For the purposes of this license and as defined in *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers Area Sources*, 40 C.F.R. Part 63, Subpart JJJJJJ, *seasonal boiler* means a boiler that undergoes a shutdown for a period of at least 7 consecutive months (or 210 consecutive days) each 12-month period due to seasonal conditions, except for periodic testing. Periodic testing shall not exceed a combined total of 15 days during the 7-month shutdown. This definition only applies to boilers that would otherwise be included in the biomass subcategory or the oil subcategory of 40 C.F.R. Part 63, Subpart JJJJJJ.

E. 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 the addition of Boiler #6 and the new Lumber Drying Kiln 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.

The emission increases are determined by subtracting the baseline actual emissions of the 24 months preceding the modification (or representative 24 months) from the projected actual emissions. The results of this comparison are as follows:

Pollutant	Baseline Actual Emissions *10/14 – 9/16* (ton/year)	Projected Actual Emissions (ton/year)	Emissions Increase (ton/year)	Significant Emissions Increase Levels (ton/year)
PM	40.22	50.91	10.7	25
PM_{10}	40.22	50.91	10.7	15
$PM_{2.5}$	28.16	36.74	8.6	10
SO_2	3.35	4.67	1.3	40
NO_x	29.5	41.09	11.6	40
CO	80.45	112.05	31.6	100
VOC	57.30	96.20	38.9	40
CO_2e	< 75,000	< 75,000	< 75,000	75,000

Note: The above values are for existing Boilers #4 and #5, the two *existing* Lumber Drying Kilns, new Boiler #6, and the *new* Lumber Drying Kiln only. None of the other equipment at the facility is affected by this NSR license.

Therefore, 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 since the changes being made are not addressed or prohibited in the Part 70 air emission license. An application to incorporate the requirements of this NSR license into the Part 70 air emission license shall be submitted no later than 12 months from commencement of the requested operation.

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.

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

Facility and Project Description

Since 2014, Irving has been operating Boilers #4 and #5 to produce steam used to provide heat for both the mill facility and the existing lumber kilns; this steam production capacity of Boilers #4 and #5 has limited Irving's production capacity of kiln-dried lumber. Irving has proposed an improvement project to add a new biomass-fired boiler, Boiler #6, and a new Lumber Drying Kiln to their facility. Irving plans to install the new Lumber Drying Kiln next to the existing Lumber Drying Kilns, and to install Boiler #6 in the existing sawmill building or the existing boiler house.

As a consequence of this project, Irving intends to use Boiler #6 as a seasonal boiler to heat the log pond and to provide building heat to the mill building during the winter months. This change will allow all of the steam produced by Boilers #4 and #5 to be used to dry lumber instead of being split between lumber drying and building heat as was previously done. This change, with the addition of the new Lumber Drying Kiln, will allow Irving to increase its production of kiln-dried lumber.

As a result of this project, Irving has proposed to increase their VOC limit for the kiln drying of lumber from 83.4 tons/year of VOC to 93.0 tons/year of VOC and to include a fuel use limit of 6,500 tons of biomass per year for Boiler #6. Irving has not requested to amend the licensed fuel limit for Boilers #4 and #5 combined; therefore, the licensed annual emissions from those two units will remain unchanged.

B. Boiler #6 (New)

1. Project Description

Irving proposes to install either a 23 MMBtu/hr KMW biomass boiler or a 21.5 MMBtu/hr Hurst biomass boiler, to be known as Boiler #6, during the winter of 2016-2017. Irving anticipates using Boiler #6 as a seasonal boiler during the colder months to heat the log pond and sawmill, and to provide other supplemental steam as needed. This will allow the steam from Boilers #4 and #5 to be dedicated to the drying of lumber.

Boiler #6 will fire biomass consisting of bark, wet wood, and sawdust. Irving has proposed an annual fuel limit of 6,500 tons/year of biomass (50% moisture content with a heat content of 4,500 Btu/lb) on a 12-month rolling total basis. Particulate matter emissions from Boiler #6 will be controlled with a multiple cyclone (multi-clone) collector on the unit. Boiler #6 will exhaust through its own 100 foot stack.

2. Best Available Control Technology (BACT) – Boiler #6

Irving submitted a BACT analysis for the installation of Boiler #6, which will be rated at either 21.5 MMBtu/hour or 23 MMBtu/hour. The BACT analysis is based on the worst case 23 MMBtu/hour unit. The BACT procedure consists of a five step process: (1) identify control technologies; (2) eliminate technically infeasible options; (3) rank remaining control technologies by control effectiveness; (4) evaluate the most effective controls and document results, including case-by-case consideration of energy, environmental, and economic impacts, and an evaluation of the next most effective control option if the top option is not selected as BACT; and (5) select BACT, the most effective control option not rejected in a previous step.

The following summarizes Irving's BACT analysis:

a. Identification of Currently Permitted Control Technologies

Irving identified permitted control technologies currently in use on similar units as electrostatic precipitators (ESPs), wet scrubbers, and multi-clones.

b. Particulate Matter: $PM/PM_{10}/PM_{2.5}$

(1) Particulate matter emissions from fuel combustion are formed from incomplete combustion of fuel and non-combustible material in the fuel. Potential particulate matter controls for biomass boilers consist of

add-on controls, combustion of clean fuels, good combustion practices, or a combination of options.

The identification of add-on controls for the biomass boilers included electrostatic precipitators (ESPs), wet scrubbers, baghouses (fabric filters) and multi-clones. ESPs control particulate matter emissions by applying a charge to the particles in the exhaust stream, oppositely charging a collection surface where the particles accumulate, removing the collected dust by a rapping process, and collecting the dust in hoppers. Wet scrubbers consist of using particle inertia and pressure to transfer particles from the gas stream to a liquid stream using water, purging the liquid, and removing the particles in sludge form. Baghouses collect particulate matter on the surface of filter bags typically hung from a support at the top of the baghouse and having a closed top and an open cylindrical bottom into which the exhaust gases flow upward and outward, leaving the particulate collected on the inner surface. The bags are periodically cleaned and replaced as necessary. Multi-clones or mechanical collectors are cylindrical units set up in series which remove particulate matter through centrifugal force. The exhaust gases enter each cyclone near the top and spiral down around the outer part and then spiral upward toward the top outlet, while the particulates, forced together along the outer walls, conglomerate and drop down for collection in a hopper.

(2) In step two of the BACT analysis, Irving eliminated technically infeasible control options. Irving did not pursue baghouses or fabric filters further due to the risk of fires if smoldering particulates were carried over past the multi-clone into the baghouse.

(3) In step three of the BACT analysis, where the control options are ranked, Irving presents the following:

Particulate Matter Control Technology	Expected Performance Capture Efficiency	Ranking
Electrostatic Precipitator	PM: 95-99+%, PM10: 95%, PM2.5: 90%	1
Wet Scrubber	PM: 90-95%, PM10: 90-95%, PM2.5: 65-75%	2
Multi-clone	PM: 65-75%, PM10: 65-75%, PM2.5: 45-50%	3

(4) In step four of the BACT analysis, the technically feasible control options are evaluated considering economic, environmental, and energy impacts. Irving has determined that an electrostatic precipitator is not feasible for economic reasons, along with additional environmental and energy impacts; and a wet scrubber was not feasible based on significant environmental impacts due to water

management, along with not being justifiable for economic and energy considerations. The economics of installing an ESP was based on capital costs of approximately $891,000, annualized to $148,500 with annual operating costs of $33,000. An incremental PM emission reduction of less than 3.7 tons/yr from multi-clone control would result in costs of over $49,000 per ton of particulate matter reduced. ESP operations would also increase the facility's electrical use and solid waste disposal in the form of increased ash capture.

Installation of a low energy wet scrubber retrofit would include additional water use with a scrubber blow down generating effluent. Irving has no reasonable access to a wastewater treatment facility capable of processing this type waste water on a continual basis. The economic analysis for a wet scrubber results in capital costs of $441,000, annualized capital cost of $66,600, annual operating costs of $34,200, and control costs in excess of $27,000 per ton of particulate matter removed.

The proposed biomass boiler will have an enhanced multi-clone on the unit. Multi-clones are identified most often for particulate matter control for biomass boilers of this age, type, and size.

(5) The last step in a BACT analysis is the selection of BACT. BACT for particulate matter emissions from Boiler #6 is the use of a multi-clone; operation of the multi-clone whenever Boiler #6 is operating; good combustion practices; a fuel limit of 6,500 tons of biomass per year (50% moisture content with a heat content of 4500 Btu/lb), or equivalent; the boiler must be shut down for 7 consecutive months each year except for up to 15 days per year of maintenance testing to qualify as a seasonal boiler per 40 C.F.R. Part 63, Subpart JJJJJJ; and the following emission limits, with compliance based on 40 C.F.R. Part 60, Appendix A-3 Test Method 5 upon request of the Department.

	Emission Limit Basis	lb/MMBtu[1]	lb/hr
PM	Vendor guarantee	0.125	2.9
PM_{10}	Vendor guarantee	0.125	2.9
$PM_{2.5}$	Vendor guarantee	0.125	2.9

[1] New biomass boilers with a heat input capacity between 10 and 30 MMBtu/hr subject to 40 C.F.R. Part 63, Subpart JJJJJJ would traditionally be subject to a numerical emission limit of 0.07 pounds of PM per MMBtu of heat input as stated in 40 C.F.R. § 63.11201 and included in Table 1 of 40 C.F.R. Part 63, Subpart JJJJJJ; however, the wording in Table 1 exempts new biomass boilers that meet the definition of a seasonal boiler as defined in 40 C.F.R. § 63.11237. Therefore, Boiler #6 is not subject to this numerical emission limit.

c. Sulfur Dioxide: SO_2

Sulfur dioxide is formed from the combustion of sulfur present in the fuel. Control options identified for SO_2 emissions include the use of fuel with a low sulfur content, use of fuels that produce alkali ash which absorbs SO_2 (use of biomass may have some absorbing potential), sorbent injection, and SO_2 scrubbing technologies, including flue gas desulfurization or packed-bed scrubbers. All the potential controls were determined to be technically feasible, with a performance ranking as shown below:

SO_2 Control Technology	**Expected Performance Capture Efficiency**	**Ranking**
Low sulfur fuel (biomass only, no oil)	Sulfur content of biomass is extremely low compared to the sulfur content of fossil fuels	1
Sorbent injection	90-99%	2
SO_2 Scrubbing	90-99%	3

Evaluation of the technically feasible options resulted in a determination that add-on controls are not feasible for economic, energy, and environmental impact reasons. The capital cost for controls to minimize SO_2 emissions are substantial compared to firing biomass, which inherently produces low SO_2 emissions. Energy use would increase due to fan and pump electrical requirements. Environmental impacts would include chemical transport to the site, chemical storage on-site, potential chemical release risks, and waste water discharge and solid waste disposal.

BACT for sulfur dioxide emissions from Boiler #6 is the use of biomass as a fuel and the following emission limit:

	Emission Limit Basis	**lb/hr**
SO_2	AP-42, Table 1.6-2: 0.025 lb/MMBtu	0.6

d. Nitrogen Oxides: NO_x

Nitrogen oxides mainly consist of nitric oxide (NO) and nitrogen dioxide (NO_2). The two primary formation mechanisms are thermal NO_x and fuel NO_x. NO_x is formed from the oxidation of fuel-bound nitrogen in the flame and from nitrogen in the combustion air in the post flame gas. NO_x can also be formed during combustion through the reaction of hydrocarbon fragments and nitrogen in the incoming combustion air.

Control options identified for NO_X emissions include selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), flue gas recirculation (FGR) and combustion control practices. SCR and SNCR

technologies introduce a reagent, typically ammonia or urea, in the flue gas exhaust. The NO_X in the exhaust gases reacts with the reagents and is converted to nitrogen and water. SCR also utilizes a catalyst after the reagent injection point. Flue gas recirculation achieves a reduction of thermal NO_X by recirculating cooler exhaust gases back in the combustion area, lowering flame temperature and reducing NO_X formation. Oxygen concentration is also reduced with the dilution of the exhaust gas, which results in a lower flame temperature and lower NO_X formation. Combustion controls include optimization of combustion temperature, and fuel combustion efficiency to reduce NO_X, while limiting other pollutant emissions through complete combustion.

From the options for NO_X control, flue gas recirculation was eliminated from consideration due to the equipment needed to transport the flue gas at recirculation rates greater than 15%. A specific recirculation fan would be needed to withstand the high temperature and high particulate loading of the flue gas. The high particulate loading to the boiler is also of concern.

The following controls were determined to be technically feasible, with a performance ranking as listed:

NO_X Control Technology	**Expected Performance Reduction Efficiency**	**Ranking**
SCR	50-70%	1
SNCR	35-50%	2
Combustion Controls	Optimization of all pollutants	3

The evaluation of NO_X Control Technology resulted in a conclusion that add-on SCR and SNCR controls are primarily used on large industrial and utility boilers. Little information was available for smaller biomass units. One potential operating issue would be the need for additional PM controls because SCR increases PM emissions due to ammonia slip. Another possible operating issue is that SCR has been found to have the potential for alkali particles from biomass combustion to deactivate the catalyst over time. Environmental impacts with SCR include storage and chemical deliveries of aqueous ammonia or urea, accidental chemical release risks, ammonia slip emissions, and disposal of the catalyst. Energy impacts include the electrical loads for pumps and fans. The SNCR analysis for the biomass boiler resulted in similar findings as SCR. Environmental impacts with SNCR include storage and chemical deliveries of aqueous ammonia or urea, accidental chemical release risks, and ammonia slip emissions; while energy impacts include the load for pumps and fans. A report published by the National Council for Air and Stream Improvement (NCASI) in August 2003 stated that changing load

and fuel conditions in biomass boilers may significantly reduce SNCR effectiveness. Both SCR and SNCR are not considered economically feasible for this project.

NO_X emissions can be minimized by proper boiler operation and design practices. The key is to balance temperature and combustion stoichiometry while achieving efficient fuel combustion so emissions of other pollutants such as carbon monoxide and volatile organic compounds are not adversely increased as NO_X is decreased.

BACT for NO_X emissions from Boiler #6 shall be the use of good combustion control and the following emission limits:

	Emission Limit Basis	lb/MMBtu	lb/hr
NO_X	AP-42, Table 1.6-2	0.22	5.1

e. Carbon Monoxide and Volatile Organic Compounds: CO and VOC

Carbon monoxide and volatile organic compound emissions are a result of incomplete combustion, caused by conditions such as insufficient residence time or limited oxygen availability. Control options identified for CO and VOC emissions include combustion controls and a catalyst system, both feasible for this boiler, with the following ranking:

CO Control Technology	Expected Performance	Ranking
CO and VOC Catalyst	0.12 lb/MMBtu (CO) 0.014 lb/MMBtu (VOC)	1
Combustion Controls	0.6 lb/MMBtu (CO) 0.017 lb/MMBtu (VOC)	2

The evaluation of the CO and VOC catalyst control option included the finding that an auxiliary fuel would be needed to reheat the flue gas stream to a minimum catalytic oxidation requirement of 500° F, resulting in an environmental impact of generating additional emissions from the reheating source. The cost for a catalyst system is significant, especially since the systems are typically installed as part of a SCR-oxidation catalyst package. SCR was considered cost prohibitive for this boiler.

BACT for CO and VOC emissions from Boiler #6 shall be the use of good combustion control and the following emission limits:

	Emission Limit Basis	lb/hr
CO	AP-42, Table 1.6-2, 0.6 lb/MMBtu	13.8
VOC	AP-42, Table 1.6-3, 0.017 lb/MMBtu	0.4

f. Greenhouse Gas: GHG

Greenhouse gas emissions from small to mid-sized biomass boilers are minimized by the size and efficiency of the boiler. Based on the corresponding estimated potential GHG emissions from the unit (5,835 tons/year total), no specific GHG emission limits are required for Boiler #6 at this time.

g. Visible Emissions

BACT for visible emissions from the Boiler #6 stack shall be the following: Visible emissions shall not exceed 20% opacity on a six-minute block average basis, except for no more than two six-minute block averages in a continuous three-hour period, during which times visible emissions shall not exceed 50% opacity.

h. Fuel Use

Irving shall be limited to a total biomass fuel use limit of 6,500 tons/year (at 50% moisture content with a heat content of 4,500 Btu/lb), or equivalent Btu input, for Boiler #6 on a 12-month rolling total basis.

3. Periodic Monitoring – Boiler #6

Periodic monitoring for the Boiler #6 multi-clone shall consist of recordkeeping documenting maintenance, malfunctions, and downtime of the multi-clone.

Additionally, Irving shall maintain records documenting biomass fuel use by Boiler #6 on a monthly and 12-month rolling total basis.

4. New Source Performance Standards (NSPS): 40 C.F.R. Part 60, Subpart Dc

Due to its size and year of manufacture, Boiler #6 is subject to *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, 40 C.F.R. Part 60, Subpart Dc, for units greater than 10 MMBtu/hr manufactured after June 9, 1989. [40 C.F.R. § 60.40c]

Irving shall comply with all requirements of 40 C.F.R. Part 60, Subpart Dc applicable to Boiler #6 including, but not limited to, the following:

a. Irving shall submit notification to EPA and the Department of the date of construction, anticipated start-up, and actual start-up of Boiler #6. This

notification shall include the design heat input capacity of the boiler and the type of fuel to be combusted. [40 C.F.R. § 60.48c(a)]

b. Irving shall record and maintain records of the amount of each fuel combusted in Boiler #6 during each calendar month. [40 C.F.R. § 60.48c(g)]

c. Irving shall maintain each record for a period of two years following the date of such record. [40 C.F.R. § 60.48c(i)]

5. National Emissions Standards for Hazardous Air Pollutants (NESHAP): 40 C.F.R. Part 63, Subpart JJJJJJ

Boiler #6 is subject to the *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers Area Sources*, 40 C.F.R. Part 63, Subpart JJJJJJ. The unit is considered a new, seasonal, biomass boiler rated greater than 10 MMBtu/hr. [40 C.F.R. §§ 63.11193 and 63.11195]

A summary of the currently applicable federal 40 C.F.R. Part 63, Subpart JJJJJJ requirements is listed below. At this time, the Department has not taken delegation of this area source MACT (Maximum Achievable Control Technology) rule promulgated by EPA; however, Irving will still be subject to the requirements. 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

(1) Initial Notification of Compliance

An Initial Notification submittal to EPA shall be due no later than 120 days after the source becomes subject to the standard. [40 C.F.R. § 63.11225(a)(2)]

(2) Startup and Shutdown

Irving shall minimize the boiler's startup and shutdown periods and conduct startups and shutdowns according to the manufacturer's recommended procedures. If the manufacturer's recommended procedures are not available, Irving shall follow recommended procedures for a unit of similar design for which manufacturer's recommended procedures are available. [40 C.F.R. § 63.11201(b)]

(3) Boiler Tune-Up Program

(i) A boiler tune-up program shall be implemented. [40 C.F.R. § 63.11223]

(ii) Each tune-up shall be conducted at a frequency specified by the rule and based on the size, age, and operations of the boiler. See chart below:

Boiler Category	Tune-Up Frequency
Seasonal (see definition § 63.11237)	Every 5 years

[40 C.F.R. § 63.11223(a) and Table 2]

(iii)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, not to exceed 72 months from the previous inspection for seasonal boilers. [40 C.F.R. § 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 C.F.R. § 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. Delay of the inspection until the next scheduled shutdown is permitted, not to exceed 72 months from the previous inspection for seasonal boilers. [40 C.F.R. § 63.11223(b)(3)]
4. Optimize total emissions of CO, consistent with manufacturer's specifications. [40 C.F.R. § 63.11223(b)(4)]
5. Measure the concentration in the effluent stream of CO in parts per million by volume (ppmv), and oxygen in volume percent, before and after adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer. [40 C.F.R. § 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 30 days of start-up. [40 C.F.R. § 63.11223(b)(7)]

(iv) Tune-Up Report: A tune-up report shall be maintained onsite and, if requested, submitted to EPA. The report shall contain the following information:

1. The concentration of CO in the effluent stream (ppmv) and oxygen (volume percent) measured at high fire or typical operating load both **before** and **after** the boiler tune-up;

2. A description of any corrective actions taken as part of the tune-up of the boiler; and

3. The types and amounts of fuels used over the 12 months prior to the tune-up of the boiler, but only if the unit was physically and legally capable of using more than one type of fuel during that period. Units sharing a fuel meter may estimate the fuel use by each unit. [40 C.F.R. § 63.11223(b)(6)]

(4) Compliance Report

A compliance report shall be prepared by March 1st every five years which covers the previous five calendar years. The report shall be maintained by the source and submitted to the Department and to the EPA upon request. The report must include the items contained in 40 C.F.R. §§ 63.11225(b)(1) and (2), including the following: [40 C.F.R. § 63.11225(b)]

(i) Company name and address;

(ii) A statement of whether the source has complied with all the relevant requirements of this Subpart;

(iii) A statement certifying truth, accuracy, and completeness of the notification and signed by a responsible official and containing the official's name, title, phone number, email address, and signature;

(iv) The following certifications, as applicable:

1. "This facility complies with the requirements in 40 C.F.R. § 63.11223 to conduct tune-ups of each boiler in accordance with the frequency specified in this Subpart."
2. "No secondary materials that are solid waste were combusted in any affected unit."
3. "This facility complies with the requirement in 40 C.F.R. §§ 63.11214(d) and 63.11223(g) to minimize the boiler's time spent during startup and shutdown and to conduct startups and shutdowns according to the manufacturer's recommended procedures or procedures specified for a boiler of similar design if manufacturer's recommended procedures are not available."

b. Recordkeeping

Records shall be maintained consistent with the requirements of 40 C.F.R. Part 63, Subpart JJJJJJ including the following [40 C.F.R. § 63.11225(c)]:

(1) Copies of notifications and reports with supporting compliance documentation;
(2) 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;
(3) Records of the occurrence and duration of each malfunction of each applicable boiler; and
(4) Records of actions taken during periods of malfunction to minimize emissions, including corrective actions to restore the malfunctioning boiler.

Records shall be in a form suitable and readily available for expeditious review.

C. Lumber Drying Kiln (new)

1. Project Description

Irving intends to install the *new* Lumber Drying Kiln next to the *existing* Lumber Drying Kilns located at the facility. In the Lumber Drying Kiln, green lumber will be dried while stacked in the insulated chamber using air and heat from indirect steam. Water will be removed to attain wood moisture content below 20%. With the addition of the *new* Lumber Drying Kiln, Irving has requested to increase their VOC emission limit established in Specific Condition (3) of NSR license A-314-77-1-A (issued October 25, 2013) from 83.4 tons/year of VOC for the two *existing* Lumber Drying Kilns combined to 93 tons/year of VOC from all three Lumber Drying Kilns (new and existing) combined.

VOC emissions from the Lumber Drying Kilns were calculated using a total estimated production of 145 million board feet (MMBF)/year and an emission factor for spruce/fir kiln drying of 1.283 lb VOC/1,000 board feet (MBF) based on data from testing done at the University of Maine and recorded in *Estimated VOC Losses During the Drying of Five Northeastern Species* (R.W. Rice and L. Zibilske, 1999).

2. Best Available Control Technology (BACT) – New Lumber Drying Kiln

The control of VOC emissions from lumber kilns includes pollution prevention measures and add-on controls. Pollution prevention measures are

not applicable for this operation since no VOC containing chemicals are used. Add-on controls are not technically feasible due to the gas stream flow rates, variations in VOC emissions, and variations in moisture content during the drying cycles for various grades and species of wood, as well as large variations in venting by season. VOC control devices used in other manufacturing facility categories often include combustion devices which create additional environmental concerns.

BACT for the *new* Lumber Drying Kiln shall be inclusion in the total VOC limit for all three Lumber Drying kilns (new and existing) of 93.0 tons/year of VOC and the use of records documenting compliance which shall include the monthly kiln throughput rate and the VOC emission factor used for the specific species of wood dried.

3. Periodic Monitoring – New Lumber Drying Kiln

Periodic monitoring for the *new* Lumber Drying Kiln shall consist of recordkeeping for VOC emissions, including production records (kiln throughput) and VOC emissions from the Lumber Drying Kiln recorded on a monthly and 12-month rolling total basis. VOC emissions from drying of all spruce and fir species shall be calculated using an emission factor of 1.283 lb VOC/MBF.

D. Incorporation Into the Part 70 Air Emission License

The requirements in this 06-096 C.M.R. ch. 115 New Source Review license shall apply to the facility upon issuance. 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.

E. Annual Emissions

1. Emission Totals

Irving shall be restricted to the following annual emissions from the identified units, based on a 12-month rolling total. The tons per year limits were calculated based on a biomass annual fuel use limit of 35,000 tons/year (including sawdust, wood chips, and/or absorbent pads with 5,000 gallons/year of absorbed distillate fuel) for Boilers #4 and #5 combined, a biomass annual fuel use limit of 6,500 tons/year for Boiler #6, a VOC limit of 93.0 tons/year for all three Lumber Drying Kilns combined, and 100 hours/year of operation for Fire Pump #1:

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 #4 and #5 (combined)	47.3	47.3	33.1	3.9	34.7	94.5	2.7
Fire Pump #1	0.1	0.1	-	0.1	0.4	0.1	0.1
Lumber Drying Kilns (new *and* existing)	-	-	-	-	-	-	93.0
Boiler #6	3.7	3.7	3.7	0.7	6.4	17.6	0.5
Total TPY	**51.1**	**51.1**	**36.8**	**4.7**	**41.5**	**112.2**	**96.3**

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 C.F.R. Part 52, Subpart A, § 52.21, *Prevention of Significant Deterioration of Air Quality* rule. Greenhouse gases, as defined in 06-096 C.M.R. ch. 100 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).

The quantity of CO_2e emissions from this facility is less than 100,000 tons per year, based on the following:

- the facility's fuel use and throughput limits;
- worst case emission factors from the following sources: U.S. EPA's AP-42, the Intergovernmental Panel on Climate Change (IPCC), and *Mandatory Greenhouse Gas Reporting,* 40 C.F.R. Part 98,; and
- global warming potentials contained in 40 C.F.R. Part 98.

No additional licensing actions to address GHG emissions are required at this time.

III. AMBIENT AIR QUALITY ANALYSIS

Irving previously submitted an ambient air quality analysis demonstrating that emissions from the facility, in conjunction with all other sources, do not violate ambient air quality standards. The ambient air quality analysis was documented in NSR License A-314-77-1-A, dated October 25, 2013. An additional ambient air quality analysis is not required for this NSR license.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants New Source Review License A-314-77-3-A pursuant to the preconstruction licensing requirements of 06-096 C.M.R. ch. 115 and subject to the specific 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

(1) Irving is licensed to install and operate Boiler #6 and the *new* Lumber Drying Kiln. [06-096 C.M.R. ch. 115, BACT]

(2) **Boiler #6**

A. Irving shall operate the multi-clone attached to Boiler #6 at all times the boiler is in operation. Irving shall keep records documenting maintenance, malfunctions, and downtime of the multi-clone. [06-096 C.M.R. ch. 115, BACT]

B. Fuel

1. Total fuel use for Boiler #6 shall not exceed 6,500 tons/year biomass (50% moisture content with a heat content of 4,500 Btu/lb), or equivalent Btu input, on a 12-month rolling total basis. [06-096 C.M.R. ch. 115, BACT]
2. Records of annual fuel use, calculated based on actual steam production or other method approved by the Department, shall be kept on a monthly and 12-month rolling total basis. [06-096 C.M.R. ch. 115, BACT]

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

Unit	Pollutant	lb/MMBtu	Origin and Authority
Boiler #6	PM	0.125	06-096 CMR 115, BACT

D. Emissions from Boiler #6 shall not exceed the following [06-096 C.M.R. ch. 115, BACT]:

Unit	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	SO_2 (lb/hr)	NO_x (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Boiler #6	2.9	2.9	2.9	0.6	5.1	13.8	0.4

E. Visible emission from Boiler #6 shall not exceed 20% opacity on a six-minute block average basis, except for not more than two six-minute block averages in a continuous three-hour period, during which times visible emissions shall not exceed 50% opacity. [06-096 C.M.R. ch. 115, BACT]

F. 40 C.F.R. Part 60, Subpart Dc

Irving shall comply with all requirements of 40 C.F.R. Part 60, Subpart Dc, applicable to Boiler #6 including, but not limited to, the following:

1. Irving shall submit notification to EPA and the Department of the date of construction, anticipated start-up, and actual start-up of Boiler #6. This notification shall include the design heat input capacity of the boiler and the type of fuel to be combusted. [40 C.F.R. § 60.48c(a)]
2. Irving shall record and maintain records of the amount of each fuel combusted in Boiler #6 combusted during each calendar month. [40 C.F.R. § 60.48c(g)(2)]
3. Each record shall be maintained by Irving for a period of two years following the date of such record. [40 C.F.R. § 60.48c(i)]

G. 40 C.F.R. Part 63, Subpart JJJJJJ

Irving shall comply with all requirements of 40 C.F.R. Part 63, Subpart JJJJJJ, applicable to Boiler #6 including, but not limited to, the following:

1. Compliance Dates, Notifications, and Work Practice Requirements

a. Initial Notification of Compliance

An Initial Notification submittal to EPA shall be due no later than 120 days after the source becomes subject to the standard. [40 C.F.R. § 63.11225(a)(2)]

b. Startup and Shutdown

Irving shall minimize the boiler's startup and shutdown periods and conduct startups and shutdowns according to the manufacturer's recommended procedures. If the manufacturer's recommended procedures are not available, Irving shall follow recommended procedures for a unit of similar design for which manufacturer's recommended procedures are available. [40 C.F.R. § 63.11201(b)]

c. Boiler Tune-Up Program

(1) A boiler tune-up program shall be implemented. [40 C.F.R. § 63.11223]

(2) Each tune-up shall be conducted at a frequency specified by the rule and based on the size, age, and operations of the boiler. See chart below:

Boiler Category	**Tune-Up Frequency**
Seasonal (see definition § 63.11237)	Every 5 years

[40 C.F.R. § 63.11223(a) and Table 2]

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

(i) 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, not to exceed 72 months from the previous inspection for seasonal boilers. [40 C.F.R. § 63.11223(b)(1)]

(ii) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern, consistent with the manufacturer's specifications. [40 C.F.R. § 63.11223(b)(2)]

(iii) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure it is correctly calibrated and functioning properly. Delay of the inspection until the next scheduled shutdown is permitted, not to exceed 72 months from the previous inspection for seasonal boilers. [40 C.F.R. § 63.11223(b)(3)]

(iv) Optimize total emissions of CO, consistent with manufacturer's specifications. [40 C.F.R. § 63.11223(b)(4)]

(v) Measure the concentration in the effluent stream of CO in parts per million by volume (ppmv), and oxygen in volume percent, before and after adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable CO analyzer. [40 C.F.R. § 63.11223(b)(5)]

(vi) If a unit is not operating on the required date for a tune-up, the tune-up must be conducted within 30 days of start-up. [40 C.F.R. § 63.11223(b)(7)]

(4) Tune-Up Report: A tune-up report shall be maintained onsite and, if requested, submitted to EPA. The report shall contain the following information:

(i) The concentration of CO in the effluent stream (ppmv) and oxygen (volume percent) measured at high fire or typical operating load both **before** and **after** the boiler tune-up;

(ii) A description of any corrective actions taken as part of the tune-up of the boiler; and

(iii) The types and amounts of fuels used over the 12 months prior to the tune-up of the boiler, but only if the unit was physically and legally capable of using more than one type of fuel during that period. Units sharing a fuel meter may estimate the fuel use by each unit. [40 C.F.R. § 63.11223(b)(6)]

d. Compliance Report

A compliance report shall be prepared by March 1st every five years which covers the previous five calendar years. The report shall be maintained by the source and submitted to the Department and to the EPA upon request. The report must include the items contained in 40 C.F.R. §§ 63.11225(b)(1) and (2), including the following: [40 C.F.R. § 63.11225(b)]

(1) Company name and address;
(2) A statement of whether the source has complied with all the relevant requirements of this Subpart;
(3) A statement certifying truth, accuracy, and completeness of the notification and signed by a responsible official and containing the official's name, title, phone number, email address, and signature;
(4) The following certifications, as applicable:
  (i) "This facility complies with the requirements in 40 C.F.R. § 63.11223 to conduct tune-ups of each boiler in accordance with the frequency specified in this Subpart."
  (ii) "No secondary materials that are solid waste were combusted in any affected unit."
  (iii)"This facility complies with the requirement in 40 C.F.R. §§ 63.11214(d) and 63.11223(g) to minimize the boiler's time spent during startup and shutdown and to conduct startups and shutdowns according to the manufacturer's recommended procedures or procedures specified for a boiler of similar design if manufacturer's recommended procedures are not available."

2. Recordkeeping

Records shall be maintained consistent with the requirements of 40 C.F.R. Part 63, Subpart JJJJJJ including the following [40 C.F.R. § 63.11225(c)]:

a. Copies of notifications and reports with supporting compliance documentation;
b. 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;
c. Records of the occurrence and duration of each malfunction of each applicable boiler; and
d. Records of actions taken during periods of malfunction to minimize emissions, including corrective actions to restore the malfunctioning boiler.

Records shall be in a form suitable and readily available for expeditious review.

Specific Condition (3) of this NSR license shall replace Specific Condition (3) from NSR license A-314-77-1-A (issued October 25, 2013).

(3) **Lumber Drying Kilns** (2 existing kilns and 1 new kiln)

Irving shall be limited to 93.0 tons/year VOC from all three Lumber Drying Kilns on a 12-month rolling total basis. Records documenting compliance shall include the monthly kiln throughput and the VOC emission factor used for each specific species of wood dried. [06-096 C.M.R. ch. 115, BACT]

(4) Irving shall submit an application to incorporate this NSR license into the facility's Part 70 air emission license no later than 12 months from commencement of the requested operation. [06-096 C.M.R. ch. 140 § 1(C)(8)]

DONE AND DATED IN AUGUSTA, MAINE THIS 6 DAY OF November , 2016.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cone for
PAUL MERCER, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 10/13/2016
Date of application acceptance: 10/13/2016

Date filed with the Board of Environmental Protection:

This Order prepared by Jonathan E. Rice, Bureau of Air Quality.

Filed
NOV 07 2016
State of Maine
Board of Environmental Protection