



DEPARTMENT ORDER

ND OTM LLC
Penobscot County
Old Town, Maine
A-180-77-11-A

Departmental
Findings of Fact and Order
New Source Review
NSR #11

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	ND OTM LLC
LICENSE TYPE	06-096 C.M.R. ch. 115, Minor Modification
NAICS CODES	322110 Wood Pulp Manufacturing 221119 Electric Power Generation
NATURE OF BUSINESS	Pulp Manufacturing
FACILITY LOCATION	24 Portland Street, Old Town, Maine

B. NSR License Description

ND OTM LLC (ND Paper) has requested a New Source Review (NSR) license to increase the allowable low volume high concentration (LVHC) non-condensable gases (NCGs) incineration time in the #5 Power Boiler or the Biomass Boiler.

C. Emission Equipment

The following equipment is addressed in this NSR license:

Equipment	Maximum Capacity (MMBtu/hr)	Fuel Type, % sulfur
#5 Power Boiler	249	Distillate fuel, 0.0015%
		#6 fuel oil, 0.5%
Biomass Boiler	271	Natural gas, negligible
		Biomass, negligible
Biomass Boiler	265.2	Natural gas, negligible
		Natural gas, negligible

D. Definitions

Distillate Fuel means the following:

- Fuel oil that complies with the specifications for fuel oil numbers 1 or 2, as defined by the American Society for Testing and Materials (ASTM) in ASTM D396;
- Diesel fuel oil numbers 1 or 2, as defined in ASTM D975;
- Kerosene, as defined in ASTM D3699;
- Biodiesel, as defined in ASTM D6751; or
- Biodiesel blends, as defined in ASTM D7467.

E. Project Description

LVHC NCGs produced in the digester and evaporator systems are collected and controlled through incineration. Historically, the Lime Kiln has served as the primary incineration point for NCGs with the Biomass Boiler and #5 Power Boiler as backup. Air Emission License Amendment A-180-70-D-A (issued October 12, 2012) established an allowable incineration time in either the #5 Power Boiler or Biomass Boiler of up to 23.8% of the total incineration time on an annual basis.

Due to the current intermittent operation of the Lime Kiln and the pulp liquor cycle systems, ND Paper has had to rely on the #5 Power Boiler as the primary incineration point for the LVHC gases. Therefore, ND Paper is proposing to increase the allowable LVHC gas incineration time in the #5 Power Boiler and Biomass Boiler from 23.8% to 100% of the total incineration time on an annual basis. To partially offset the increase in SO₂ emissions from the additional LVHC gas incineration in the #5 Power Boiler and Biomass Boiler, ND Paper has proposed limiting the combustion of #6 fuel oil and distillate fuel in the #5 Power Boiler to a combined 8,715,000 gallons per year.

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 to increase the LVHC incineration time in the #5 Power Boiler and Biomass Boiler 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.

Because the net emission increase due to an increase in LVHC incineration time is equivalent regardless of which boiler is utilized, and no other changes in operation are proposed for the Biomass Boiler, an analysis of only the #5 Power Boiler and LVHC incineration increase is presented here.

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. ND Paper has proposed using July 1, 2010 through June 30, 2012 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. Because the #5 Power Boiler is the only emission unit affected by this modification, only #5 Power Boiler emissions have been considered in this analysis.

BAE for the #5 Power Boiler were calculated using records of fuel use and AP-42 emission factors.

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

Baseline Actual Emissions (7/2010 – 6/2012 Average)

Equipment	PM (tpy)	PM₁₀ (tpy)	PM_{2.5} (tpy)	SO₂ (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)
#5 Power Boiler	0.60	0.52	0.37	4.90	2.56	0.34	0.02
Total	0.60	0.52	0.37	4.90	2.56	0.34	0.02

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 in 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.

ND Paper has proposed a combined fuel limit for distillate fuel and #6 fuel oil fired in the #5 Power Boiler of 8,715,000 gal/year. PAE for the #5 Power Boiler is based on this new fuel limit, firing natural gas for the remainder of the boiler operating time, and worst-case emission factors established in Air Emission Licenses A-180-70-A-I (issued December 2, 2009) and A-180-77-9-A (issued April 24, 2019). PAE for LVHC incineration in either the #5 Power Boiler or Biomass Boiler is based on LVHC combustion 8,760 hours/year, and emission factors established in Air Emission License A-180-70-A-I (issued December 2, 2009).

Projected actual emissions from the affected equipment are shown below.

Projected Actual Emissions

Equipment	PM (tpy)	PM₁₀ (tpy)	PM_{2.5} (tpy)	SO₂ (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)
#5 Power Boiler	57.03	57.03	57.03	333.62	221.10	109.98	35.23
NCG incineration in either #5 Power Boiler or Biomass Boiler	--	--	--	343.4	--	--	--
Total	57.03	57.03	57.03	677.02	221.10	109.98	35.23

3. Emission Adjustments

In determining projected actual emissions, ND Paper may exclude increases in emissions that the existing equipment could have accommodated during the baseline period and that are unrelated to the current project. This is known as the Demand Growth Exclusion. [40 C.F.R. § 52.21(b)(41)]

To determine how much of the emissions increases are attributable to the project versus market demand, ND Paper looked at what emissions would have been produced if the mill had been operating at its full licensed capacity during the baseline period.

ND Paper's current and future plans are to fully utilize the mill's existing production capacity. The #5 Power Boiler and existing production equipment are capable of physically handling the maximum production of the pulp mill within existing license limits. Therefore, the portion of the #5 Power Boiler's emissions following the project that the unit could have accommodated during the baseline period and that are unrelated to the LVHC gas incineration time increase is excludable under the Demand Growth Exclusion.

Demand Growth Exclusion Emissions Adjustments

Equipment	PM (tpy)	PM₁₀ (tpy)	PM_{2.5} (tpy)	SO₂ (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)
#5 Power Boiler	86.65	86.73	86.88	633.04	302.81	119.62	35.23
Total	86.65	86.73	86.88	633.04	302.81	119.62	35.23

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 7/10 – 6/12 (ton/year)	Projected Actual Emissions (ton/year)	Excludable Emissions (ton/year)	Emissions Increase (ton/year)	Significant Emissions Increase Levels (ton/year)
PM	0.60	57.03	86.65	-30.22	25
PM ₁₀	0.52	57.03	86.73	-30.22	15
PM _{2.5}	0.37	57.03	86.88	-30.22	10
SO ₂	4.90	677.02	633.04	39.08	40
NO _x	2.56	221.10	302.81	-84.27	40
CO	0.34	109.98	119.62	-9.98	100
VOC	0.02	35.23	54.51	-19.3	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. ND Paper has submitted an application to incorporate the requirements of this NSR license into the facility's Part 70 air emission license.

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.

B. NCG Incineration in #5 Power Boiler and Biomass Boiler

For a modified emission unit, BACT shall be applied to the regulated pollutants that will be emitted in greater amounts as a result of the modification, and BPT shall apply to other regulated pollutants for the modified unit [06-096 C.M.R. ch. 115 § 4(A)(4)(d)]. The proposed LVHC incineration time increase in the #5 Power Boiler and Biomass Boiler will result in an increase in SO₂ emissions only. ND Paper has submitted a BACT analysis addressing SO₂ emissions from the #5 Power Boiler and Biomass Boiler.

1. BACT Findings

SO₂ is formed from sulfur in the fuel and sulfur contained in the NCGs. ND Paper evaluated potentially applicable SO₂ emission control technologies as identified by researching technical literature, control equipment vendor information, and EPA's RACT/BACT/LAER Clearinghouse. ND Paper identified two methodologies for reducing SO₂ emissions: using a fuel with a lower sulfur content or add-on pollution control to desulfurize the flue gas.

It is not feasible to reduce the sulfur content of the NCGs. ND Paper has proposed limiting the fuel oil (which has a sulfur content of up to 0.5% by weight) fired in the #5 Power Boiler to no more than 8,715,000 gal/year. There will be no limit on the amount of natural gas (which has a near negligible sulfur content) fired in the #5 Power Boiler. The Biomass Boiler burns biomass and natural gas, both of which are inherently low sulfur fuels. No new limits will be placed on the amount of biomass or natural gas fired in the Biomass Boiler.

Flue gas desulfurization processes absorb SO₂ contained in the flue gas using an alkaline reagent, most commonly sodium hydroxide, to produce neutral salts. There are two main subcategories of flue gas desulfurization processes, dry scrubber or wet scrubber systems. Wet scrubbers have control efficiencies up to 98%, and dry scrubbers have control efficiencies up to 90%. According to an EPA Air Pollution Control Technology Fact Sheet (EPA-452/F-03-034), the capital cost for a wet scrubber system ranges from \$25,000 - \$150,000 per MMBtu in 2001 dollars. ND OTM identified several complexities associated with the retrofit of a wet scrubber on existing units that are expected to increase capital costs by nearly 30%. Also accounting for operating and maintenance costs, this equates to an annualized cost of approximately \$10,600 per ton of SO₂ controlled for the #5 Power Boiler and approximately \$13,700 per ton of SO₂ controlled for the Biomass Boiler, both in 2020 dollars. For a dry scrubber, the capital cost ranges from \$30,000 to \$150,000 per MMBtu, which equates to an average annualized cost of over \$17,000 per ton of SO₂ controlled for the #5 Power Boiler and over \$15,000 per ton of SO₂ controlled for the Biomass Boiler, both in 2020 dollars. ND Paper has determined that add-on SO₂ controls are not economically feasible.

BACT for SO₂ for the #5 Power Boiler and Biomass Boiler shall be a limit of 8,715,000 gal/year of distillate fuel and #6 fuel oil (combined) combusted in the #5 Power Boiler, and the following emission limits for SO₂ while combusting LVHC gases.

Equipment	Fuel	SO ₂ lb/hr
#5 Power Boiler	Fuel oil* without NCG incineration	126.99
	Fuel oil* with NCG incineration	205.39
	Natural gas without NCG incineration	0.16
	Natural gas with NCG incineration	78.6
Biomass Boiler	Biomass/natural gas without NCG incineration	6.6
	Biomass/natural gas with NCG incineration	85.0

*Distillate fuel, #6 fuel oil, or a combination thereof.

2. BPT Findings

Emission limits when not combusting LVHC gases and for all other pollutants are unchanged by this NSR license. Existing emission limits for all other pollutants from the #5 Power Boiler and Biomass Boiler contained in ND Paper's Part 70 Air Emission License have been determined by the Department to meet BPT.

C. 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.

D. Annual Emissions

The table below provides an estimate of facility-wide annual emissions for the purposes of calculating the facility's annual air license fee. Only licensed equipment is included, i.e., emissions from insignificant activities are excluded. Similarly, unquantifiable fugitive particulate matter emissions are not included. Emissions for the #5 Power Boiler were calculated based on a combined total 8,715,000 gal/year distillate fuel and #6 fuel oil, with the remainder of the operating time firing natural gas. Emissions from NCG incineration were calculated based on 8,760 hours NCG incineration in either the #5 Power Boiler. All other emissions are unchanged by this NSR license.

Please note, this information provides the basis for fee calculation only and should not be construed to represent a comprehensive list of license restrictions or permissions. That information is provided in the Order section of this license.

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

	PM	PM ₁₀	SO ₂	NO _x	CO	VOC
#5 Power Boiler	57.03	57.03	333.6	221.10	109.98	35.23
Biomass Boiler	35.0	35.0	29.0	290.3	929.3	19.7
NCG incineration in either #5 Power Boiler or Biomass Boiler	--	--	343.4	--	--	--
Gas Turbine	1.1	1.1	0.5	20.9	12.8	5.7
#4 Recovery Boiler	177.2	177.2	768.3	812.3	1,396.6	92.4
#4 Smelt Tank	33.07	33.07	14.61	0.28	0.28	0.28
Lime Kiln	144.1	144.1	31.1	157.7	357.8	5.3
Total Services Backup Sump Pump	0.1	0.1	0.02	1.4	0.3	0.1
Water Intake Emergency Generator	0.2	0.2	0.002	2.2	0.2	0.1
Power House Fire Backup Pump	0.1	0.1	0.02	1.5	0.3	0.1
#4 Turbine Backup Generator	0.09	0.09	0.02	1.3	0.3	0.1
Backup gen. for Biomass Boiler	0.1	0.1	0.14	5.1	1.4	0.3
Screw Press Steam Generator	2.2	2.2	5.5	81.1	17.5	6.6
Biorefinery	--	--	--	--	--	2.5
Total TPY	450.3	450.3	1,526.2	1,595.2	2,826.8	168.4

III. AMBIENT AIR QUALITY ANALYSIS

The permittee previously submitted an ambient air quality impact analysis demonstrating that emissions from the facility, in conjunction with all other sources, do not violate ambient air quality standards (AAQS). An additional ambient air quality impact 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-180-77-11-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) #5 Power Boiler LVHC Incineration

A. Fuel

1. Combined total distillate fuel and #6 fuel oil use for the #5 Power Boiler shall not exceed 8,715,000 gal/year, based on a 12-month rolling total basis. [06-096 C.M.R. ch. 115, BACT]
 2. ND Paper shall not purchase or otherwise obtain distillate fuel with a maximum sulfur content that exceeds 0.0015% by weight (15 ppm). [06-096 C.M.R. ch. 115, BACT]
 3. ND Paper shall not purchase or otherwise obtain #6 fuel oil with a maximum sulfur content that exceeds 0.5% by weight. [06-096 C.M.R. ch. 115, BACT]
 4. Compliance shall be demonstrated by fuel records showing the quantity, type, and the percent sulfur of the fuel delivered or fuel used (if applicable). Records of annual fuel use shall be kept on a monthly and 12-month rolling total basis. Fuel sulfur content compliance shall be demonstrated by fuel delivery receipts from the supplier, fuel supplier certification, certificate of analysis, or testing of the tank containing the fuel to be fired. [06-096 C.M.R. ch. 115, BACT]
- B. ND Paper is licensed to fire low volume high concentration (LVHC) non-condensable gases (NCGs) in the #5 Power Boiler. [06-096 C.M.R. ch. 115, BACT]

C. SO₂ emissions from the #5 Power Boiler shall not exceed the following limits:

Fuel	SO ₂ lb/hr
Fuel oil* without NCG incineration	126.99
Fuel oil* with NCG incineration	205.39
Natural gas without NCG incineration	0.16
Natural gas with NCG incineration	78.6

*Distillate fuel, #6 fuel oil, or a combination thereof.

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

(2) **Biomass Boiler LVHC Incineration**

A. ND Paper is licensed to fire low volume high concentration (LVHC) non-condensable gases (NCGs) in the Biomass Boiler. [06-096 C.M.R. ch. 115, BACT]

B. SO₂ emissions from the Biomass Boiler shall not exceed the following limits:

Operating Mode	SO ₂ lb/hr
Not incinerating NCGs	6.6
Incinerating NCGs	85

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

DONE AND DATED IN AUGUSTA, MAINE THIS 24th DAY OF SEPTEMBER, 2020.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:  for
MELANIE LOYZIM, ACTING COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: June 3, 2020

Date of application acceptance: June 15, 2020

Date filed with the Board of Environmental Protection:

This Order prepared by Benjamin Goundie, Bureau of Air Quality.

FILED
SEP 24, 2020
State of Maine
Board of Environmental Protection