



DEPARTMENT ORDER

**FMC Corporation
Knox County
Rockland, Maine
A-366-77-7-A**

**Departmental
Findings of Fact and Order
New Source Review
NSR #7**

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	FMC Corporation
LICENSE TYPE	06-096 C.M.R. ch. 115, Minor Modification
NAICS CODES	311999, 325412
NATURE OF BUSINESS	Refined Hydrocolloids Products
FACILITY LOCATION	Crocketts Point, P.O. Box 308, Rockland, ME

B. NSR License Description

FMC Corporation (FMC) has requested a New Source Review (NSR) license amendment to change the emission limits for NO_x for Boilers #3 and #5 when firing natural gas and the NO_x emission limit for Boiler #3 when firing distillate fuel. Previous NO_x emission limits for the boilers established in the NSR license A-366-77-6-A (issued on March 26, 2014) were based on AP-42 emission factors. Diagnostic sampling indicated that these emission factors were underestimating the emissions, later confirmed when compared to the manufacturer emission guarantees for the burners. The new emission limits are based on BACT findings.

This amendment will change the licensed NO_x emission limit to 0.17 lb/MMBtu for Boiler #3 and #5 when firing natural gas. The amendment will also change the licensed NO_x emission limit for Boiler #3 when firing distillate fuel to 0.2 lb/MMBtu.

C. Emission Equipment

The following equipment is addressed in this NSR license:

Fuel Burning Equipment

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type, % sulfur	Stack #
Boiler #3	85.6	1385 scfm	Natural Gas	5-1
		610 gal/hr	Distillate Fuel	
Boiler #5	48.4	784 scfm	Natural Gas	5-1
		346 gal/hr	Distillate Fuel	

D. Definitions

Distillate Fuel. For the purposes of this license, *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. 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 FMC does not violate any applicable federal or state requirements and does not reduce monitoring, reporting, testing, or recordkeeping requirements. However, this application does seek to modify a Best Available Control Technology (BACT) analysis performed per New Source Review.

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 average actual emissions of the 24 months preceding the modifications (or representative 24 months) from the projected future actual emissions. The results are as follows:

<u>Pollutant</u>	<u>Baseline Actual Emissions 2010 & 2011 (ton/year)</u>	<u>Projected Future Actual Emissions from Distillate Fuel (ton/year)</u>	<u>Projected Actual Emissions from Natural Gas (ton/year)</u>	<u>Net Emissions Increase based on worse case between Distillate and Natural Gas (ton/year)</u>	<u>Significant Emissions Increase Levels (ton/year)</u>
NO _x	171	140	119	-31.22	40

Note: The above values are for Boilers #3, #4, and #5 only. None of the other equipment at the facility is affected by this NSR license. (Updated Table from A-366-77-6-A issued on March 26, 2014).

The following assumptions were made:

- Average past actuals emissions were based on Boilers #3, #4, and #5 firing #6 fuel oil and the use of AP-42 emission factors.
- Projected future actual emissions were based on the firing of distillate fuel equating to 1,400,000 MMBtu/yr. (Heat input of 140,000 Btu/gal was used)
- Projected future actual emissions were based on the firing of natural gas equating to 1,400,000 MMBtu/yr. (Heat input of 1030 Btu/scf was used)

The expected emissions are below the significant emission increase levels; therefore, this amendment 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.

The annual license allowed emission limits are not changing with this amendment.

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. Project Description

In New Source Review license A-366-77-6-A (issued on March 26, 2014), Boilers #3, #4, and #5 were licensed to fire natural gas and distillate fuel instead of #6 fuel oil and licensed emission limits were on AP-42 emission factors for NO_x. The NO_x emission factors are being updated to reflect an updated BACT determination by the Department. All other emission factors will remain as licensed in A-366-77-6-A.

C. Updated NO_x Emission Limits

Boiler #3 is a Union Iron Works Combustion Engineering boiler installed in 1966 with a maximum design heat input capacity of 85.6 MMBtu/hr. Boiler #5 is also a Union Iron Works Combustion Engineering boiler installed in 1963 with a maximum design heat input capacity of 48.4 MMBtu/hr.

The proposed modification is to increase the licensed natural gas NO_x emission limits for Boilers #3 and #5 and to increase the licensed distillate fuel NO_x emission limit for Boiler #3 addressed in New Source Review License A-366-77-6-A. The proposed NO_x emission rates submitted in that application were based on EPA's AP-42 factors of 100 lb/MMscf for natural gas (Table 1.4-1 dated 7/98) and 24 lb/1000 gal for distillate fuel (Table 1.3-1 dated 5/01) respectively. These factors calculate out to 8.31 lb/hr and 4.70 lb/hr of NO_x, for Boiler #3 and #5 respectively, using natural gas with a heat content of 1030 Btu/scf; and 14.67 lb/hr of NO_x when firing distillate fuel in Boiler #3.

Following the fuel switchover, FMC conducted diagnostic testing which indicated the emissions were very close to the emission limits. Upon further investigation, FMC became aware that the licensed emission limits were below the burner vendor guarantees of 0.17 lb/MMBtu for NO_x when firing natural gas in Boilers #3 and #5 and below 0.20 lb/MMBtu/hr when firing distillate fuel in Boiler #3. The higher than predicted values were due to the unique characteristics of the boilers including their age, that the original boilers' designs did not include firing natural gas and distillate fuel, and that the boilers are high heat release units.

FMC has requested a NO_x emission limit of 0.17 lb/MMBtu for Boilers #3 and #5 when each unit is firing natural gas and 0.2 lb/MMBtu when firing distillate fuel in Boiler #3. These limits are representative for these types of boilers, and are lower than the emission limits when firing #6 fuel oil.

In addition, a comparison of similar Maine boilers which have converted from #6 fuel oil to natural gas (included in FMC's application dated August 11, 2016) indicates that industrial boilers of similar size and age (pre-1980) either do not have a lb/MMBtu limit or have limits ranging from 0.10 lb/MMBtu to 0.2 lb/MMBtu.

BACT for firing natural gas in the boilers is good combustion control based on similar licensed sources and information in EPA's RACT/BACT/LAER Clearing-house listing. Review of recent, similar projects did not identify any required add-on controls. The cost of additional controls to reduce NO_x from 0.17 to 0.10 lb/MMBtu indicate costs of over \$3500/ton discussed in FMC's application for this amendment. Therefore, FMC has proposed good combustion control to minimize NO_x emissions as BACT for both natural gas and distillate fuel.

The Department approves change in NO_x emission limits during the firing of natural gas and distillate fuel in #3 and #5 Boilers as described above as BACT.

The BACT NO_x emission limits for Boilers #3 and #5 when firing natural gas shall be revised to the following:

Unit	lb/MMBtu	lb/hr
Boiler #3	0.17	14.55 lb/hr
Boiler #5	0.17	8.23 lb/hr

The BACT NO_x emission limits for Boilers #3 when firing distillate fuel shall be revised to the following:

Unit	lb/MMBtu	lb/hr
Boiler #3	0.2	17.12 lb/hr

FMC will continue to have a heat input limit of 1,400,000 MMBtu/year based on the sum of heat input from natural gas and fuel oil on a 12-month rolling total basis.

The current license requirements in Air Emission License A-366-70-F-R and NSR licenses A-366-77-2-A, A-366-77-3-M, A-366-77-4-M, and A-366-77-5-M will continue to apply including recordkeeping of the type and amount of each type of fuel consumed.

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, FMC shall submit an application to incorporate this amendment into its pending Part 70 license renewal.

III. AMBIENT AIR QUALITY ANALYSIS

FMC 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. 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-366-77-7-A pursuant to the preconstruction licensing requirements of 06-096 C.M.R. ch. 115 and subject to the standard and 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 conditions shall replace Specific Condition (1) A in NSR License A-366-77-6-A upon issuance of this license:

- (1) Boilers #3, #4, and #5
- A. Fuel oil sulfur requirements
1. Prior to July 1, 2018, FMC shall fire distillate fuel with a maximum sulfur content not to exceed 0.5% by weight. [06-096 C.M.R. ch. 115, BPT/BACT]
 2. Beginning July 1, 2018, FMC 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, BPT/BACT]
 3. FMC shall keep records from the supplier documenting type of fuel oil delivered, sulfur content of the distillate fuel, and heat content of the fuel. [06-096 CMR 115, BACT]

The following NO_x limits shall replace the NO_x limits found in Specific Condition (1)G in A-366-77-6-A upon issuance of this license:

- (2)
- A. Emissions from Boiler #3 shall not exceed the following limits when firing distillate fuel:

<u>Pollutant</u>	<u>Lb/MMBtu</u>	<u>Origin and Authority</u>
NO _x	0.20	06-096 CMR 115, BACT

<u>Pollutant</u>	<u>Lb/hr</u>	<u>Origin and Authority</u>
NO _x	17.12	06-096 CMR 115, BACT

- B. Emissions from Boiler #3 shall not exceed the following limits when firing natural gas:

<u>Pollutant</u>	<u>Lb/MMBtu</u>	<u>Origin and Authority</u>
NO _x	0.17	06-096 CMR 115, BACT

<u>Pollutant</u>	<u>Lb/hr</u>	<u>Origin and Authority</u>
NO _x	14.55	06-096 CMR 115, BACT

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The following NO_x limits shall replace the NO_x limits found in Specific Condition (1)I in A-366-77-6-A upon issuance of this license

(3)

Emissions from Boiler #5 shall not exceed the following limits when firing natural gas:

<u>Pollutant</u>	<u>Lb/MMBtu</u>	<u>Origin and Authority</u>
NO _x	0.17	06-096 CMR 115, BACT

<u>Pollutant</u>	<u>Lb/hr</u>	<u>Origin and Authority</u>
NO _x	8.23	06-096 CMR 115, BACT

DONE AND DATED IN AUGUSTA, MAINE THIS 9 DAY OF November, 2016.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Core for
PAUL MERCER, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 8/18/2016

Date of application acceptance: 8/18/2016

Date filed with the Board of Environmental Protection:

This Order prepared by Lisa P. Higgins, Bureau of Air Quality.

