



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



PAUL R. LEPAGE  
GOVERNOR

PATRICIA W. AHO  
COMMISSIONER

**FMC Corporation  
Biopolymer Division  
Know County  
Rockland, Maine  
A-366-77-6-A**

**Departmental  
Findings of Fact and Order  
New Source Review  
NSR #6**

**FINDINGS OF FACT**

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

**I. REGISTRATION**

A. Introduction

FACILITY	FMC Corporation (FMC)
LICENSE TYPE	06-096 CMR 115, Minor Modification
NAICS CODES	311999, 325412
NATURE OF BUSINESS	Refined Hydrocolloid Products
FACILITY LOCATION	Crocketts Point, P.O. Box 308, Rockland, ME

B. Amendment Description

FMC has requested to allow natural gas and #2 fuel oil to be fired in Boilers #3, #4, and #5 with natural gas as the primary fuel. #2 fuel oil will be utilized as a back-up in case natural gas is not available. Both natural gas and #2 fuel oil will replace the presently licensed #6 fuel oil. Upon completion of the fuel conversion project, #6 fuel oil will no longer be fired in these boilers.

C. Emission Equipment

The following equipment is addressed in this air emission license:

**Fuel Burning Equipment**

<u>Equipment</u>	<u>Maximum Capacity (MMBtu/hr)</u>	<u>Maximum Firing Rate</u>	<u>Fuel Type</u>	<u>Stack #</u>
#3 Boiler	85.6	1385 scfm, 610 gal/hr	Natural gas, # 2 fuel oil, 0.5% S	5-1
#4 Boiler	48.6	787 scfm, 350 gal/hr	Natural gas, # 2 fuel oil, 0.5% S	5-1
#5 Boiler	48.4	784 scfm, 346 gal/hr	Natural gas, # 2 fuel oil, 0.5% S	5-1

D. Application Classification

The application for FMC does not violate any applicable federal or state requirements and does not reduce monitoring, reporting, testing or record keeping. 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 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 (CMR) 100 (as amended).

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 test are as follows:

<b>Pollutant</b>	<b>Baseline Actual Emissions (Average of 2010 &amp; 2011) (ton/year)</b>	<b>Projected<sup>(1)</sup> Actual Emissions from #2 Fuel oil (ton/year)</b>	<b>Projected<sup>(2)</sup> Actual Emissions from Natural Gas (ton/year)</b>	<b>Net Emissions Increase based on worse case between #2 Fuel Oil and Natural gas (ton/year)</b>	<b>Significance Emissions Increase Levels (ton/year)</b>
PM	68.49	56	35	-12.5	25
PM <sub>10</sub>	63.2	52	32.3	-11.5	15
PM <sub>2.5</sub>	5.27	4.31	2.69	-0.96	10
SO <sub>2</sub>	488	352.5	0.41	-135	40
NO <sub>x</sub>	171	120	68	-51.22	40
CO	11.4	25	57.1	45.7	100
VOC	3.65	3.74	3.74	0.09	40
CO <sub>2e</sub>	59,493	113,899	83,997	54,406	75,000

Note: The above numbers are for Boilers #3, #4, and #5 only. None of the other equipment at the facility is affected by this amendment.

The following assumptions were made:

- (1) Projected actual emissions were based on the firing of #2 fuel oil equating to 1,400,000 MMBtu/yr. (Heat input of 140,000 Btu/gal was used)
- (2) Projected 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 changes 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 CMR 115 (as amended) 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 amendment 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 CMR 100 (as amended). 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 CMR 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

### **Natural Gas and #2 Fuel Oil in Boilers #3, #4, and #5**

FMC is requesting a license amendment to replace #6 fuel oil with natural gas and #2 fuel oil in Boilers #3, #4, and #5. The boilers presently burn exclusively #6 fuel oil except during periods of startup. To fire natural gas and #2 fuel oil, new dual fuel burners and the associated piping will be installed. Natural gas is to be fired as the primary fuel with #2 fuel oil as a backup fuel.

FMC is proposing to increase their licensed Carbon Monoxide (CO) limit from the boilers from 25 tons/year to 57.1 tons/year. The Volatile Organic Compounds (VOC) limit for the facility will remain the same. In addition, FMC will be limited based on heat input based limit and not fuel use. The facility will 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.

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. Based on a comparison of criteria pollution emission factors from boilers firing oil and boilers firing natural gas, factors are lower for natural gas except for CO and VOC which are higher.

In the instance of firing #2 fuel oil instead of #6 fuel oil; there will be a reduction in all pollutants except CO. The Department finds firing #2 fuel oil and natural gas in Boilers #3, #4, and #5 is BACT.

The BACT emission limits for the boilers were based on the following:

#### #2 Fuel Oil

- PM/PM<sub>10</sub> – 0.08 lb/MMBtu based on 06-096 CMR 115
- SO<sub>2</sub> – based on firing ASTM D396 compliant #2 fuel oil (0.5% sulfur); 0.5 lb/MMBtu
- NO<sub>x</sub> – 24 lb/1000 gal based on 06-096 CMR 115
- CO – 5 lb/1000 gal based on AP-42, Table 1.3-1, dated 5/10
- VOC – 0.34 lb/1000 gal based on AP-42, Table 1.3-3, dated 5/10
- Opacity – 06-096 CMR 115, BACT

The BACT emission limits for the boilers when firing #2 fuel oil are the following:

<u>Unit</u>	<u>PM</u> <u>(lb/hr)</u>	<u>PM<sub>10</sub></u> <u>(lb/hr)</u>	<u>SO<sub>2</sub></u> <u>(lb/hr)</u>	<u>NO<sub>x</sub></u> <u>(lb/hr)</u>	<u>CO</u> <u>(lb/hr)</u>	<u>VOC</u> <u>(lb/hr)</u>
Boiler #3 (85.6 MMBtu/hr), #2 fuel	6.85	6.85	43.11	14.67	3.06	0.12
Boiler #4 (48.6 MMBtu/hr) #2 fuel	3.89	3.89	24.47	8.33	1.74	0.07
Boiler #5 (48.4 MMBtu/hr), #2 fuel	3.87	3.87	24.37	8.30	1.73	0.07

If any of the boilers are firing #2 fuel oil, the visible emissions from stack #5-1 shall not exceed 20% opacity on a 6 minute block average, except for no more than one (1) six (6) minute block average in a 3 hour period.

Natural Gas

- PM/PM<sub>10</sub> – 0.05 lb/MMBtu based on 06-096 CMR 115, BACT
- SO<sub>2</sub> – 0.6 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
- NO<sub>x</sub> – 100 lb/MMscf based on AP-42, Table 1.4-1, dated 7/98
- CO – 84 lb/MMscf based on AP-42, Table 1.4-1, dated 7/98
- VOC – 5.5 lb/MMscf based on AP-42, Table 1.4-2, dated 7/98
- Opacity – 06-096 CMR 115, BACT

The BACT emission limits for the boilers when firing natural gas are the following:

<u>Unit</u>	<u>PM</u> <u>(lb/hr)</u>	<u>PM<sub>10</sub></u> <u>(lb/hr)</u>	<u>SO<sub>2</sub></u> <u>(lb/hr)</u>	<u>NO<sub>x</sub></u> <u>(lb/hr)</u>	<u>CO</u> <u>(lb/hr)</u>	<u>VOC</u> <u>(lb/hr)</u>
Boiler #3 (85.6 MMBtu/hr) nat'l gas	4.28	4.28	0.05	8.31	6.98	0.46
Boiler #4 (48.6 MMBtu/hr) nat'l gas	2.43	2.43	0.03	4.72	3.96	0.26
Boiler #5 (48.4 MMBtu/hr) nat'l gas	2.42	2.42	0.03	4.70	3.95	0.26

If natural gas is being fired in the boilers, visible emissions from the combined stack, stack #5-1, shall not exceed 10% opacity on a 6 minute block average basis, except for no more than one (1) six (6) minute block average in a 3 hour period.

The Department approves allowing the firing of natural gas and #2 fuel oil in #3, #4, and #5 Boilers. Both fuels result in a reduction of most of the pollutants. The current license requirements in Air Emission License A-366-70-F-R and amendments 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.

B. Incorporation into the Part 70 Air Emission License

The requirements in this 06-096 CMR 115 New Source Review amendment shall apply to the facility upon amendment issuance. Per *Part 70 Air Emission License Regulations*, 06-096 CMR 140 (as amended), Section 1(C)(8), for a modification that has undergone NSR requirements or been processed through 06-096 CMR 115, the source must then apply for an amendment to the Part 70 license within one year of commencing the proposed operations as provided in 40 CFR Part 70.5.

C. Annual Emissions

1. FMC shall be limited to firing 10,000,000 gallons of #6 fuel oil in Boilers #3, #4, and #5 on a 12 month rolling total until the Boilers are converted to natural gas and/or #2 Fuel Oil. During the first year following the conversion the monthly MMBtu/yr value of the #6 fuel oil fired shall be used in calculating the heat input rolling average.
2. FMC shall be restricted to the following annual emissions, based on a 12 month rolling total. The tons per year limits were calculated based on a heat input limit of 1,400,000 MMBtu/yr from firing natural gas and/or #2 Fuel Oil in the boilers.
3. The Emergency Generators shall each be limited to 500 hours of operation on a 12 month rolling total.

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

	PM	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC
Boilers	150	150	1570	375	57.1	8
Unit #23 & #26	0.3	0.3	0.2	6.5	1.7	0.2
Generators	0.3	0.3	0.2	7.4	1.9	0.3
Plant Processes	-	-	-	-	-	426
<b>Total TPY</b>	<b>150.6</b>	<b>150.6</b>	<b>1570.4</b>	<b>388.9</b>	<b>60.7</b>	<b>434.5</b>

4. 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 CFR Part 52, Subpart A, §52.21 Prevention of Significant Deterioration of Air Quality rule. "Greenhouse gases" as defined in 06-096 CMR 100 (as amended) means the aggregate group of the following gases: Carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Greenhouse gases (GHG) for purposes of licensing are calculated and reported as carbon dioxide equivalents (CO<sub>2</sub> e).

Based on the facility's fuel use limit(s), the worst case emission factors from AP-42, IPCC (Intergovernmental Panel on Climate Change), and *Mandatory Greenhouse Gas Reporting*, 40 CFR Part 98, and the global warming potentials contained in 40 CFR Part 98, this modification does not exceed a significance Emissions Increase Level threshold for a major modification. Therefore, no additional licensing requirements are needed to address GHG emissions at this time.

### 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 amendment.

### ORDER

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

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

The Department hereby grants Air Emission License A-366-77-6-A pursuant to the preconstruction licensing requirements of 06-096 CMR 115 and subject to the specific conditions below.

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

### SPECIFIC CONDITIONS

- (1) **The following condition shall replace Condition (14) A. of Air Emission License A-366-70-F-R upon conversion from #6 fuel oil to #2 fuel oil and natural gas:**

Boilers #3, #4, #5

A. Fuel oil sulfur requirements

1. The #2 fuel oil fired in the boilers shall have a maximum sulfur content based on firing ASTM D396 compliant #2 fuel oil (0.5% sulfur). [06-096 CMR 115, BACT]
2. Beginning July 1, 2016, the facility shall fire #2 fuel oil with a maximum sulfur content limit of 0.005% by weight (50 ppm).  
[38 MRSA §603-A(2)(A)(3)]
3. Beginning January 1, 2018, the facility shall fire #2 fuel oil with a maximum sulfur content limit of 0.0015% by weight (15 ppm).  
[38 MRSA §603-A(2)(A)(3)]



4. FMC shall keep records from the supplier documenting type of fuel oil delivered, sulfur content of the #6 and #2 fuel oil, and nitrogen content of the #6 fuel oil when fired by weight (as documented by supplier, otherwise FMC shall test once per calendar quarter), and heat content of the fuel. [A-366-70-A-I (6/28/2002), and 06-096 CMR 115, BACT]

**The following condition shall replace Condition (14) B. of Air Emission License A-366-70-F-R upon conversion from #6 fuel oil to #2 fuel oil and natural gas:**

B.

1. The total heat input resulting from the combustion of the #6 fuel oil, #2 fuel oil, and natural gas in Boilers 3, 4, and #5 shall not exceed 1,400,000 MMBtu on a 12-month rolling total. The actual heat value of the natural gas, as provided by the supplier, may be used instead of the 0.00103 MMBtu/scf value listed in the equation below. The following shall be used to determine the monthly heat input into all of the boilers:

$$\left(\frac{\text{gal\#6FuelOil}}{\text{month}}\right)\left(\frac{0.15\text{MMBtu}}{\text{gal\#6FuelOil}}\right) + \left(\frac{\text{gal\#2FuelOil}}{\text{month}}\right)\left(\frac{0.14\text{MMBtu}}{\text{\#2FuelOil}}\right) + \left(\frac{\text{scf nat. gas}}{\text{month}}\right)\left(\frac{0.00103\text{MMBtu}}{\text{scf nat. gas}}\right) = \frac{\text{MMBtu heat input to boilers}}{\text{month}}$$

2. FMC shall operate fuel flow meters on Boilers #3, #4 and #5 to demonstrate compliance. Records detailing fuel usage in each boiler and the calculated total heat input to the boilers shall be maintained on a monthly basis, in addition to a 12-month rolling total. [A-366-70-A-I (6/28/2002) and 06-096 CMR 115, BACT]

The following condition shall replace Condition (14) G. of Air Emission License A-366-70-F-R upon conversion from #6 fuel oil to #2 fuel oil and natural gas :

G.

1. Emissions from Boiler #3 shall not exceed the following limits when firing #2 fuel oil:

<u>Pollutant</u>	<u>Lb/MMBtu</u>	<u>Origin and Authority</u>
PM	0.08	06-096 CMR 115, BACT
NO <sub>x</sub>	0.17	06-096 CMR 115, BACT

<u>Pollutant</u>	<u>Lb/hr</u>	<u>Origin and Authority</u>
PM	6.85	06-096 CMR 115, BACT
PM <sub>10</sub>	6.85	06-096 CMR 115, BACT
SO <sub>2</sub>	43.11	06-096 CMR 115, BACT
NO <sub>x</sub>	14.67	06-096 CMR 115, BACT
CO	3.06	06-096 CMR 115, BACT
VOC	0.12	06-096 CMR 115, BACT

2. 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>
PM	0.05	06-096 CMR 115, BACT
NO <sub>x</sub>	0.10	06-096 CMR 115, BACT

<u>Pollutant</u>	<u>Lb/hr</u>	<u>Origin and Authority</u>
PM	4.28	06-096 CMR 115, BACT
PM <sub>10</sub>	4.28	06-096 CMR 115, BACT
SO <sub>2</sub>	0.05	06-096 CMR 115, BACT
NO <sub>x</sub>	8.31	06-096 CMR 115, BACT
CO	6.98	06-096 CMR 115, BACT
VOC	0.46	06-096 CMR 115, BACT

The following condition shall replace Condition (14) H. of Air Emission License A-366-70-F-R upon conversion from #6 fuel oil to #2 fuel oil and natural gas

H.

1. Emissions from Boiler #4 shall not exceed the following limits when firing #2 fuel oil:

<u>Pollutant</u>	<u>Lb/MMBtu</u>	<u>Origin and Authority</u>
PM	0.08	06-096 CMR 115, BACT
NO <sub>x</sub>	0.17	06-096 CMR 115, BACT

<u>Pollutant</u>	<u>Lb/hr</u>	<u>Origin and Authority</u>
PM	3.89	06-096 CMR 115, BACT
PM <sub>10</sub>	3.89	06-096 CMR 115, BACT
SO <sub>2</sub>	24.47	06-096 CMR 115, BACT
NO <sub>x</sub>	8.33	06-096 CMR 115, BACT
CO	1.74	06-096 CMR 115, BACT
VOC	0.07	06-096 CMR 115, BACT

2. Emissions from Boiler #4 shall not exceed the following limits when firing natural gas:

<u>Pollutant</u>	<u>Lb/MMBtu</u>	<u>Origin and Authority</u>
PM	0.05	06-096 CMR 115, BACT
NO <sub>x</sub>	0.10	06-096 CMR 115, BACT

<u>Pollutant</u>	<u>Lb/hr</u>	<u>Origin and Authority</u>
PM	2.43	06-096 CMR 115, BACT
PM <sub>10</sub>	2.43	06-096 CMR 115, BACT
SO <sub>2</sub>	0.03	06-096 CMR 115, BACT
NO <sub>x</sub>	4.72	06-096 CMR 115, BACT
CO	3.96	06-096 CMR 115, BACT
VOC	0.26	06-096 CMR 115, BACT

The following condition shall replace Condition (14) I. Air Emission License A-366-70-F-R upon conversion from #6 fuel oil to #2 fuel oil and natural gas:

I.

1. Emissions from Boiler #5 shall not exceed the following limits when firing #2 fuel oil:

<u>Pollutant</u>	<u>Lb/MMBtu</u>	<u>Origin and Authority</u>
PM	0.08	06-096 CMR 115, BACT
NO <sub>x</sub>	0.17	06-096 CMR 115, BACT

<b>Pollutant</b>	<b>Lb/hr</b>	<b>Origin and Authority</b>
PM	3.87	06-096 CMR 115, BACT
PM <sub>10</sub>	3.87	06-096 CMR 115, BACT
SO <sub>2</sub>	24.37	06-096 CMR 115, BACT
NO <sub>x</sub>	8.3	06-096 CMR 115, BACT
CO	1.73	06-096 CMR 115, BACT
VOC	0.07	06-096 CMR 115, BACT

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

<b>Pollutant</b>	<b>Lb/MMBtu</b>	<b>Origin and Authority</b>
PM	0.05	06-096 CMR 115, BACT
NO <sub>x</sub>	0.10	06-096 CMR 115, BACT

<b>Pollutant</b>	<b>Lb/hr</b>	<b>Origin and Authority</b>
PM	2.42	06-096 CMR 115, BACT
PM <sub>10</sub>	2.42	06-096 CMR 115, BACT
SO <sub>2</sub>	0.03	06-096 CMR 115, BACT
NO <sub>x</sub>	4.70	06-096 CMR 115, BACT
CO	3.95	06-096 CMR 115, BACT
VOC	0.26	06-096 CMR 115, BACT

**The following condition shall replace Condition (14) J. Air Emission License A-366-70-F-R upon conversion from #6 fuel oil to #2 fuel oil and natural gas:**

**J. Visible Emissions**

1. If any of FMC's boilers are firing #2 fuel oil, the visible emissions from stack #5-1 shall not exceed 20% opacity on a 6 minute block average, except for no more than one (1) six (6) minute block average in a 3 hour period. [06-096 CMR 115, BACT]
2. If natural gas is being fired in FMC's boilers, visible emissions from stack #5-1 shall not exceed 10% opacity on a 6 minute block average basis, except for no more than one (1) six (6) minute block average in a 3 hour period. [06-096 CMR 115, BACT]

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- (2) FMC shall submit an application to incorporate this amendment into the Part 70 air emission license no later than 12 months from commencement of the requested operation. [06-096 CMR 140, Section 1(C)(8)]

DONE AND DATED IN AUGUSTA, MAINE THIS 26 DAY OF March, 2014.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: *Marc Allen Robert Cove for*  
PATRICIA W. AHO, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 1/30/2014

Date of application acceptance: 2/3/2014

Date filed with the Board of Environmental Protection:

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

