Illinois Environmental Protection Agency
Bureau of Air, Permit Section
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Project Summary
For An Application For a Revised Construction Permit from
Patriot Renewable Fuels, LLC
For An
Ethanol Plant
In Annawan, Illinois

Site Identification No.: 073802AAD
Application No.: 06010085
Date Received: January 21, 2010

Schedule
Public Comment Period Begins: June 12, 2010
Public Hearing Date: July 29, 2010
Public Comment Period Closes: August 28, 2010

Illinois EPA Contacts
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I. Introduction

Patriot Renewable Fuels, LLC (Patriot) has applied for a revision to the air pollution control construction permit for its new ethanol plant constructed east of Annawan. Patriot has requested that the permitted production capacity of the plant be increased by 18 percent, to 130 million gallons per year, from the 110 million gallons per year authorized by the original permit. In conjunction with increased production, Patriot has also requested increases in the permitted emissions of various pollutants from certain operations at the plant. However, the plant would still be not considered construction of a major new source of emissions.

The Illinois EPA has reviewed Patriot's application for a revised permit and made preliminary determination that the application meets applicable requirements. Accordingly, the Illinois EPA has prepared a draft of the construction permit that it would propose to issue for the proposed revisions. However, before issuing the permit, the Illinois EPA is holding a public comment period and a public hearing to receive comments on the proposed issuance of a revised permit and the terms and conditions of the draft of the revised permit.

II. Background

The original construction permit for the ethanol plant, Permit 06010085, was issued on October 5, 2006. The permit requires Patriot to use appropriate equipment for effective control of emissions from the various operations at the plant, including:

Fabric filters to control particulate matter emissions from the principle grain handling operations, milling of grain, and the handling and load out of the dried feed.

A scrubber to control organic material emissions from the fermentation units at the plant. The organic material laden water from this scrubber would be reused at the plant, so that the scrubber would not be a source of wastewater.

Combustion control, with natural gas fired thermal oxidizer/boiler systems, for emissions of organic material23, carbon monoxide and particulate matter from the feed dryers, which complete the conversion of wet stillage into dry feed. These oxidizers also control organic material emissions from certain units in mash preparation area, distillation operation, and solid separation and evaporation units. Furthermore these oxidizer/boiler systems also have status as emission units, as it supplies the process steam needed to run the plant.

For organic material emissions from leaking equipment components, such as valves, flanges, pressure relief devices, pump seals, etc., involved with fermentation and the subsequent handling of product ethanol, a Leak Detection and Repair Program, with regular inspections of components for leaks and timely repairs of any leaking components.

For fugitive dust generated by vehicle traffic and wind blown dust on roadways and parking lots, by paving of plant roads and a Fugitive Dust Control Program.

III. Project Description

The Patriot has requested an increase in the permitted capacity of its new ethanol plant. The increase will not require construction of new emission units but rather be achieved through enhancements to installed equipment and changes to operating procedures. These improvements are reflected in a higher guarantee for plant capacity from the firm that designed this plant.

This increase in plant production would be accompanied by increases in amount of corn processed, feed produced, and ethanol shipped and associated increases in permitted emissions of certain units at the plant. The requested increases in emissions from the plant are not proportional to the increase in production. First, emissions from some units need not be increased as emissions from these units were originally permitted at levels that accommodate operation at the higher level of throughput. For example, feed cooler, fire pump engine and miscellaneous units are already permitted for levels of emissions consistent with operation at the request level of production.

Second, the requested increase in emissions of certain units would address both increases in permitted capacity and change in the manner in which emissions are determined. For example, oxidizer/boiler systems, ethanol loadout, biomethanator flare, and fugitive dust emissions are permitted for levels higher than the 18 percent increase requested in the production. For the oxidizer/boiler systems requested increase in NOx and CO emissions would address both increase in permitted capacity and increased emission factor to allow the oxidizer temperature flexibility. In particular, the oxidizer/boiler systems would be operating at higher operating temperature to provide additional steam required for increased capacity. For the loadout of ethanol the requested increase in VOM emissions for would address both increases in permitted capacity and a change in the manner in which VOM emissions from loadout are determined. In particular, VOM emissions for truck loadout are now based on a saturation factor of 1.0 (as opposed to 0.6 used originally), as is more appropriate for loadout when a vapor balance system may have been used for the prior cargo handled by a tank truck. To better account for the efficiency of the vapor collection capture efficiencies of 98.7 and 95 percent are now used for truck and rail loadout, respectively.

For the biomethanator flare, Patriot has requested greater flexibility to accommodate all gas being fired, as well as an increase in emissions from the increased production.

For fugitive dust, Patriot has requested road surface silt loading factor of 2.5 gram per meter square rather than 0.4 gram per meter square.

Third, emissions from certain other units would increase proportional to the increase in production. These units include fermentation scrubber, feed cooler and storage tanks.

Finally, the emissions from certain other units are permitted at lower level than originally permitted. These units include grain receiving, handling and milling operations, component leaks, and cooling tower.

IV. Emissions

A summary of the permitted or potential emissions of Patriot's new ethanol plant is provided below. These limits are based on the maximum emissions rates predicted by Patriot in the application and operation at the requested level of production. Actual annual emissions of the plant would be less than these limits to the extent that the actual performance of the equipment is better than projected and the equipments are not utilized as much.

Summary of Permitted Emissions of the Plant (Tons/Year)

Pollutant	Original Permit	Proposed Permit
NOx	96.30	156.21
CO	98.00	148.30
VOM	98.00	118.70
PM_{10}	79.00	90.30
PM	97.40	205.70
SO_2	82.40	96.95
Individual HAP*	9.87	9.80
Total HAPs	16.81	21.97

* Acetaldehyde is the individual HAP that is emitted in the largest amount and must be effectively controlled to maintain plant status as a minor source for HAPs.

V. Applicable Emission Standards

All emission sources in Illinois must comply with the Illinois Pollution Control Board's emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The plant should readily comply with applicable state emission standards (35 Ill. Adm. Code: Subtitle B).

The oxidizer/boiler systems at the plant are subject to the federal New Source Performance Standards (NSPS), 40 CFR 60 Subpart Db, for boilers. The Illinois EPA is administering NSPS in Illinois on behalf of the United States EPA under a delegation agreement. These standards address NOX emission from boilers limiting NOX emissions to 0.1 lb/mmBtu. The boilers should readily comply with this standard.

VI. Applicable Regulatory Programs

A. Prevention of Significant Deterioration (PSD)

This plant is not considered a major stationary source under the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. In particular, ethanol plants are not in one of the 28 listed categories of sources for which the major source threshold is the potential to emit 100 tons per year or more. This is consequence of changes to the PSD rules by USEPA, in which the ethanol plants are reclassified as not being "chemical process plants".

With the requested increase in permitted capacity, the permitted emissions of the plant for NOx, CO, VOM, and PM would be more than 100 tons per year. However, due to the changes in the PSD rules as discussed above, the plant still would not considered a major PSD source because the potential emissions after the proposed changes, as limited by the permit, would be less than the applicable major source thresholds for PSD rules, which is now 250 tons per year. It should be noted that Patriot has not requested to remove any control devices because of this change in the PSD rules. However, the requested increase in emissions due to increase in production is facilitated by this change in the PSD rules.

The boilers at the plant also would not constitute a major source for purposes of PSD. First, the total heat input of the boilers, based on the supplemental heat input provided by the oxidizers is only 244 million Btu/hour. In addition, the NOx and CO emissions of the boilers at the plant, when considered by themselves, will remain below 100 tons/year, so that the boilers would not be subject to PSD even if their heat input exceeded 250 million Btu/hr.1

B. Section 112(g) of the Clean Air Act

This plant is not considered a new major source for Hazardous Air Pollutants (HAP), so that the plant is not subject to the requirements of Section 112(g) of the Clean Air Act. For this purpose, the increase in the permitted production of plant is not being considered separately from the plant as originally permitted. HAP emissions from the plant with the proposed changes would still be limited to less than 10 tons per year for individual HAP and less than 25 tons per year for aggregate HAPs.

C. Clean Air Act Permit Program (CAAPP)

After the proposed changes, the plant would be classified as a major source under Illinois' Clean Air Act Permit Program (CAAPP) pursuant to Title V of the Clean Air Act. This is because the increase in the permitted emissions has resulted in at least one

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[1] Approximately 60 percent of the emissions of the dryer/oxidizer/boiler systems are attributable to the oxidizers. [(2x122) / (4x45) + (2x122) = 57.5 percent]. The amount of NO_x emissions attributable to the oxidizers is only 90 tons/year. (150 tons/yr x 0.60 = 90 tons/yr).

pollutant in excess of 100 tons per year. Accordingly, would be required to obtain a CAAPP permit for the operation of the plant, rather than a state operating permit.

VII. Draft of Revised Permit

The revised permit for the plant would contain limitations and requirements for the grain handling, fermentation system, distillation system, feed drying/cooling, ethanol storage/loading, and oxidizer/boiler systems to help assure that the plant complies with applicable regulatory requirements. The permit would also identify measures that must be used as good air pollution control practices to minimize emissions.

The permit would includes enforceable limits on emissions and operation of emission units to assure that plant remains below the levels at which it would be considered major for PSD or emissions of HAP. In addition to limiting annual emissions, the permit would also include limits on hourly emissions, annual ethanol production, and annual grain receipts. The permit would also establish appropriate compliance procedures for the plant, including requirements for emission testing, monitoring, recordkeeping, and reporting. Emission testing is required as part of the initial shakedown and operation of the plant after completion of construction.

These measures are being imposed to assure that the emissions of the plant are accurately tracked to confirm compliance with both the short-term and annual emission limits established for them.

VIII. Request for Comments

It is the Illinois EPA's preliminary determination that the application for a revised permit meets all applicable state and federal air pollution control requirements. The Illinois EPA is therefore proposing to issue a revised permit.

Comments are requested on this proposed action by the Illinois EPA and the proposed conditions of the draft permit.