

Illinois Environmental Protection Agency
Bureau of Air, Permit Section
Springfield, Illinois

Project Summary
For a Construction Permit Application from
Patriot Renewable Fuels, LLC
For Revisions to the Construction Permit
For Its Fuel Ethanol Plant
In Annawan, Illinois

Site Identification No.: 073802AAD
Application No.: 06010085
Date Received: May 5, 2011

Schedule

Public Comment Period Begins: July 15, 2011
Public Comment Period Closes: August 14, 2011

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 fuel ethanol plant east of Annawan. In particular, Patriot has requested changes to the provisions of the permit for the two oxidizer/boiler systems to reflect a higher heat input capacity and associated changes to other provisions of the permit.

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 to receive comments on the proposed issuance of the revised construction permit and the terms and conditions of the draft of the revised construction permit.

II. Background

The original construction permit for the ethanol plant, Permit 06010085, was issued on October 5, 2006. This permit was later revised in 2010 to increase permitted production capacity of the plant to 130 million gallons per year, from 110 million gallons per year authorized by the original permit. 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 material, 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

Patriot has requested changes to the provisions of the permit for the two oxidizer/boiler systems that would enable the plant to increase the production of the ethanol as allowed in the revised permit previously issued on September 8, 2010.

Patriot has further evaluated the oxidizer/boiler systems and determined that their rated capacities are 145 million Btu/hr, each, rather than 122 million Btu/hr, as reflected in the current permit. The higher heat input capacity would not require physical changes to the oxidizer/boiler systems but rather be achieved through combination of increasing the speed of combustion air fan, increasing fuel pressure, and possibly changes to burner setting to increase fuel flow to the burners. The changes to the oxidizer/boiler systems would also be accompanied by an increase in the amount of natural gas fired and associated increase in permitted emissions of certain pollutants from the systems.

Emissions of sulfur dioxide(SO₂) , individual hazardous air pollutant (HAP) other than acetaldehyde, and total HAP from the oxidizer/boiler systems would have minimal increases from the changes. Nitrogen oxide (NO_x), carbon monoxide (CO), particulate matter (PM), and volatile organic material (VOM) emissions from the oxidizer/boiler systems need not be increased as emissions from these systems were previously permitted at levels that accommodated operation at the higher level of heat input.

These changes do not result in any other changes to the operation of this ethanol plant that would increase its permitted corn input, feed production and ethanol production capacity, above the levels addressed by previously issued permit.

IV. Emissions

A summary of the future permitted or potential emissions of plant is provided below Table 1. These limits are based on the maximum emissions rates predicted by Patriot in the application for 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 equipments does not operate at capacity.

Table 1: Summary of Permitted Emissions of the Plant (Tons/Year)

Pollutant	Existing Permit	Proposed Permit	Change
NOx	156.21	156.21	-
CO	148.30	148.30	-
VOM	118.70	118.70	-
PM/PM ₁₀ *	62.33	62.33	-
SO ₂	96.95	97.07	0.12
Acetaldehyde	9.801	9.801	-
Total HAPs, Other Than Acetaldehyde	12.172	12.542	0.37
Total HAPs	21.973	22.343	0.37

* Excludes fugitive emissions from roadways and open areas.

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 NO_x emission from boilers limiting NO_x emissions to 0.1 lb/mmBtu. The boilers should readily comply with this standard.

VI. Applicable Regulatory Programs

A. Prevention of Significant Deterioration (PSD)

The plant is not a major stationary source under the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21, for the pollutants other than greenhouse gases (GHGs). This is because:

- i. The potential emissions of each PSD pollutant other than GHG from the plant, as limited by the permit, would be less than the major source threshold of the PSD rules (i.e., less than 250 tons per year).
- ii. The oxidizer/boiler systems, as a group, will not be major sources of emissions for purposes of PSD. This is because the potential emissions of each PSD pollutant other than GHG from the group of boilers would be less than the major source threshold of the PSD rules (i.e., 100 tons per year).

Note: For purposes of PSD, "fossil fuel boilers" with heat input totaling more than 250 mmBtu/hr with potential to emit 100 tons per year or more of any PSD pollutant other than GHG would be considered a "major stationary source", as defined by 40 CFR 52.21(b)(1)(i)(a). As a result of the increase in capacity of the oxidizer/boiler systems, the combined firing rate of the boilers at the plant is now greater than 250 mmBtu/hr.

The requested revision to the permit is not a major project for emissions of GHGs pursuant to 40 CFR 52.21(b)(49)(v)(b). Although the plant is major for emissions of GHGs, with the potential to emit over 100,000 tons/year of GHGs other than biogenic CO₂, the increase in emissions of GHGs from the increase in rated capacity of the oxidizer/boiler systems is accompanied by an increase in emissions that is less than 75,000 tons per year of carbon dioxide equivalents.

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

This plant is not a 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. This is because 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)

The plant would continue to be classified as a major source under Illinois' Clean Air Act Permit Program (CAAPP) pursuant to Title V of the Clean Air Act after revisions. This is because the plant would be permitted to emit more than 100 tons per year for several pollutants. Accordingly, would be required to obtain a CAAPP permit for the operation of the plant, rather than a state operating permit.

VII. Draft Permit of Revised Permit

The revised permit for the plant would set forth the air pollution control requirements that apply to the plant. These requirements include the applicable emission standards that apply to the plant. They also include the measures that must be used as good air pollution control practices to minimize emissions.

The permit would also establish enforceable limitations on the amount of emissions for which the plant is permitted following the changes. In addition to annual limitations on emissions, the permit includes short-term emission limitations and operational limitations, as needed to provide practical enforceability of the annual emission limitations.

The permit also establishes appropriate compliance procedures for the plant, including requirements for emission testing, required work

practices, operational monitoring, recordkeeping, and reporting. These measures are imposed to assure that the operation and emissions of the plant are appropriately tracked to confirm compliance with both the short-term and annual emission limits established for individual emission units.

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.