

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

Project Summary  
For a Construction Permit Application from  
Illinois River Energy, LLC  
For Revisions to the Construction Permit  
For Its Fuel Ethanol Plant  
In Rochelle, Illinois

Site Identification No.: 141050ABP  
Application No.: 06060083  
Date Received: December 20, 2010

Schedule

Public Comment Period Begins: February 12, 2012  
Public Comment Period Closes: March 13, 2012

Illinois EPA Contacts

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I. Introduction

Illinois River Energy, LLC (Illinois River) has applied for a revision to the air pollution control construction permit for its fuel ethanol plant in Rochelle. In particular, Illinois River has requested that the permitted production capacity of the plant be increased to 125 million gallons per year, from the 115 gallons per year authorized by the expansion project permit.

The Illinois EPA has reviewed Illinois River'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 02120027, was issued on January 28, 2004. This permit allowed production capacity of 60 million gallons per year. In 2007, Illinois River was issued a construction permit, Construction Permit 06060083, for expansion of this plant. This expansion project with its permitted production capacity of 55 million gallons per year, increased the permitted capacity of the plant to 115 million gallons per year from the original construction permit.

The original construction permit and the expansion project permit required Illinois River 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 (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 oxidizer/boiler systems 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 are minimized by paving of plant roads and a Fugitive Dust Control Program.

### III. Project Description

Illinois River has now requested that the permitted production capacity of the plant be increased to 125 million gallons per year from 115 million gallons per year authorized by the expansion project permit. The increase will not require construction of new emission units but rather be achieved through enhancements to installed equipment and changes to operating procedures.

The 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.

In conjunction with increase in production, Illinois River has also requested changes in the permitted emissions of various pollutants from certain operation at the plant. However, plant wide emission other than for volatile organic material (VOM), as permitted in the revised permit, are lower than currently permitted levels.

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 grain handling and processing system<sup>1</sup>, fermentation scrubbers, oxidizer/boiler systems, component leaks, bio-methanator and miscellaneous units are already permitted for levels of emissions consistent with operation at the requested 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 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 existing rail loadout operation are now based on emission being controlled by the existing flare (as opposed to minimizing emissions by submerged loading and use of dedicated rail cars, which previously handled ethanol). For cooling tower the requested increase in PM emissions would be based on the maximum circulation rate of the towers (as oppose to estimated circulation rates in the original construction permit).

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<sup>1</sup> Construction Permit 10100043 issued on November 30, 2010 allowed several changes to grain handling and processing system including the particulate matter emissions from grain handling and processing system for expansion project permit.

For the fire pump engine, Illinois River has requested increase in permitted operating hours to 500 hours per year from 200 hours per year permitted in the original construction permit. However emissions of all pollutants would not be increased as it is now estimated based on manufacturer's guaranteed data for the engine.

Third, emissions from certain other units would increase proportional to the increase in production. These units include storage tanks and fugitive emissions from the plant roads and parking area.

Finally, the emissions from certain other units are permitted at lower level than originally permitted. These units include dry feed loadout operations.

IV. Emissions

A summary of the future permitted or potential emissions of plant is provided below in Table 1. These limits are based on the maximum emission rates predicted by Illinois River 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 equipment does not operate at capacity.

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

Pollutant	Existing Permit	Proposed Permit	Change
NO <sub>x</sub>	187.91	187.73	-0.18
CO	183.04	182.91	-0.13
VOM	188.24	189.31	+1.07
PM/PM <sub>10</sub>	167.65	163.54	-4.11
SO <sub>2</sub>	85.82	85.47	-0.35
Acetaldehyde	9.977	9.752	-0.225
Total HAPs, Other Than Acetaldehyde	9.012	8.52	-0.492
Total HAPs	18.989	18.272	-0.717

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<sub>x</sub> emission from boilers which limits NO<sub>x</sub> 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 project addressed by this revised permit, i.e., the further increase in the permitted overall production of the plant to 125 million gallons/year, is not being a major project subject to the requirements of the federal rules for Prevention of Significant Deterioration (PSD), 40 CFR 52.21. In particular:

- i. For purpose of plant-wide applicability, including emissions of oxidizer/boiler systems at the plant, this is because:
  - a. The Permitted emissions of each regulated PSD pollutant other than greenhouse gases (GHG) from plant would be less than the major source threshold for the PSD rules, (i.e., less than 250 tons per year).
  - b. The increase in GHG emissions from the proposed project, excluding biogenic CO<sub>2</sub> is not significant. In particular, the potential increase in GHG emission, i.e., difference between the potential GHG emission after the proposed project and the historic emission is 41,500 tons CO<sub>2</sub>e per year, which is less than the significant level, i.e., 75,000 tons/year.
- ii. For purpose of fossil fuel-fired boilers at the plant<sup>2</sup>, i.e., oxidizer/boiler systems, this is because:
  - a. The permitted emissions of each oxidizer/boiler system, i.e., the system that is part of the original plant and the system that is part of the expansion plant, would each be less than major source threshold of the PSD rules for pollutants other than GHG, (i.e., less than 100 tons per year).
  - b. The increases in emission of NO<sub>x</sub>, CO, and PM/PM<sub>10</sub>/PM<sub>2.5</sub> are not significant. In particular, the increases in NO<sub>x</sub>, CO, and PM/PM<sub>10</sub>/PM<sub>2.5</sub> emissions, i.e., difference between the potential emission, as permitted, after the proposed project and the historic emissions are 32.8, 14.8, and 3.1 tons per year, respectively. These are less than the significant level for emissions of NO<sub>x</sub>, CO, and PM/PM<sub>10</sub>/PM<sub>2.5</sub>, i.e., 40, 100, and 25/15/10 tons/year, respectively.

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<sup>2</sup> For purposes of the PSD rules, the boilers at the plant, as a group, are considered a "major stationary source". This is because the combined heat input of these boilers totals more than 250 million Btu/hour as permitted in Construction Permit 11040038, issued in December 2011. Under the PSD rules, the major source threshold for "fossil fuel boilers" with heat input totaling more than 250 million Btu/hour is 100 tons per year of any PSD pollutant other than GHG as provided by 40 CFR 52.21(b)(1)(i)(a).

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

The revised 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 revised permit also establishes appropriate compliance procedures for the plant, including requirements for emission testing for fermentation scrubbers and oxidizer/boiler systems at increased production capacity, 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 federal and state rules for 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.

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