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BUREAU OF AIR, PERMIT SECTION
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PROJECT SUMMARY
FOR A CONSTRUCTION PERMIT APPLICATION
FROM
ALGONQUIAN ETHANOL PLANT, LLC.
FOR A
ETHANOL PLANT
IN PRINCETON, ILLINOIS

Site Identification No.: 011085ABN
Application No.: 06090011
Date Received: September 6, 2006

Schedule

Public Comment Period Begins: April 28, 2007
Public Comment Period Closes: May 28, 2007

Illinois EPA Contacts

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I. INTRODUCTION

Algonquian Ethanol Plant, LLC. (Algonquian Ethanol) has submitted an application to construct a fuel ethanol plant in Princeton. The construction of the proposed plant requires a permit from the Illinois EPA because the plant would be a source of emissions.

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

II. PROJECT DESCRIPTION

The principal products produced at ethanol plants are ethanol and distiller grains. The ethanol is ethyl alcohol, made primarily from corn and various other grains and can be used as an octane enhancer in fuel, an oxygenated fuel additive that can reduce the carbon monoxide emissions from the vehicle. The distiller grains are the grains with soluble that can be used as an animal feed.

Algonquian Ethanol has proposed to construct 113.7 million gallon per year dry mill ethanol plant. In this process corn is received by the rail or truck and screened for rocks and cobs before sent to storage bins. Corn is then transferred to a surge bin by conveyor and metered to a hammermill by a weigh belt feeder.

The ground corn is then sent to enzymatic processing. In the enzymatic process ground corn is turned into fine slurry by adding water, heat and enzymes. The fine slurry is then sent to liquefaction process where other enzymes are added to convert the starches into glucose sugars. Next the corn slurry is sent to fermentation process where yeast is added to begin the fermentation process.

Distillation system is utilized to separate the alcohol from the corn mash. Both streams are routed to the dehydration equipments to extract the ethanol. Ethanol is further refined to have 200 proof ethanol alcohols in molecular sieve. The ethanol is stored and denatured prior to sent out to customers. Mash stream from the dehydration equipments are sent to solids separation and evaporation equipments where excess water is removed to have "wet cake". The water, "thin stillage" is pumped to an evaporator to produce thick syrup. The wet cake and thick syrup are conveyed to dryers to remove moisture and produce dried distillers grain with solubles (DDGS). The DDGS is conveyed to a storage area for cooling and readied for shipment via rail car or truck.

Two natural gas fired dryers will be sized to dry all wet cake produced at the proposed plant. The dried feed is then cooled as it is being conveyed to the feed storage area prior to shipping to customers. Each dryer and associated cooler are controlled by oxidizers that also control emissions from certain emission units from mash preparation and distillation process and ethanol loadout operation.

Four natural gas fired boiler would be used to generate the steam required for the ethanol process. All four boilers will be equipped with low-NO_x burner.

A non-contact wet cooling tower would be used for process cooling. The PM emissions from cooling tower are controlled by mist eliminators.

Equipment components, such as valves, flanges, pump seals, etc., involved with fermentation and subsequent handling of ethanol and denaturant generates VOM emissions when they leak. These emissions will be minimized with a Leak Detection and Repair (LDAR) Program, which requires regular inspections of component for leaks and timely repairs of any leaking components.

Fugitive dust and particulate matter emissions are generated by vehicle traffic and wind blown dust on roadways, parking lots and other open areas at the plant. These emissions would be minimized with a Fugitive Dust Control Program as well as pavement of new roadways and the parking lots for the facility.

III. PROJECT EMISSIONS

The proposed fuel ethanol plant would use appropriate equipment for effective control of emissions from the various operations at the plant. Fabric filters would be used to control particulate matter emissions from the principle grain handling operations at the elevator and from milling of grain. A filter would be used to control particulate matter emissions from the handling and load out of the dried feed.

A scrubber would be used to control organic material emissions from the fermentation operations. 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 oxidizers, would be used to control emissions of organic material, carbon monoxide and particulate matter from the natural gas-fired feed dryers. These oxidizers, as well as the natural gas fired dryers, would be equipped with low-NO_x burners to minimize nitrogen oxide emissions. These oxidizer systems would also be used to control emissions from the mash preparation, distillation and ethanol loadout operations

As a result of this emission control equipment and other equipment and control measures that would be used at the source, Algonquian Ethanol has proposed to control emissions of the source so that it would not be a major source subject to the Clean Air Act Permit Program (CAAPP) after the start up of the fuel ethanol plant. Annual emissions from the source would be limited to no more than 98 tons of each criteria pollutant (particulate matter, nitrogen oxides (NO_x), carbon monoxide, etc.), 8.0 tons of any single hazardous air pollutant¹ and 20 tons of total hazardous air

¹ While most of the organic material emissions of the proposed plant would be ethanol, the plant would also have emissions of organic compounds, such as acetaldehyde, formaldehyde and methanol, which are listed as hazardous air pollutants by Section 112(b) of the federal Clean Air Act.

pollutants.² These limits are based on data for the maximum emissions of the proposed plant and represent its permitted emissions. Actual 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 plant does not operate at its capacity.

IV. 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 proposed facility will readily comply with applicable state emission standards (35 Ill. Adm. Code: Subtitle B).

Certain emissions units at the proposed plant would also be subject to the federal New Source Performance Standards (NSPS), at 40 CFR 60, which the Illinois EPA administers for source in Illinois on behalf of the United States EPA under a delegation agreement. These units include the boilers (40 CFR 60, Subpart Dc), product ethanol storage tanks (40 CFR 60, Subpart Kb) and component leaks in the distillation area (40 CFR 60, Subpart VV). These units should also readily comply with applicable NSPS standards and requirements.

V. APPLICABLE REGULATORY PROGRAMS

This facility is not considered a new major stationary source under the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. This is because the potential emissions from the proposed facility, as limited by the permit, would be less than the major source thresholds for PSD.

VI. PROPOSED PERMIT

The conditions of the draft permit for the facility contain limitations and requirements for the grain handling, fermentation system, distillation system, feed drying/cooling, ethanol storage/loading, and boilers to help assure that the facility complies with applicable regulatory requirements. The draft permit also identifies measures that must be used as good air pollution control practices to minimize emissions.

The draft permit includes enforceable limits on emissions and operation for the equipments to assure that facility remains below the levels at which it would be considered major for PSD. In addition to limiting annual emissions, the permit also includes limits on hourly emissions, annual ethanol production, and annual grain receipts.

The permit also establishes appropriate compliance procedures for the facility, including requirements for emission testing, monitoring, recordkeeping, and reporting. Emission testing is required as part of the initial shakedown and operation of the facility after completion of construction.

² The draft permit would limit emissions from the source to less than the thresholds for a major source under the Clean Air Act Permit Program (CAAPP), e.g., annual emissions of 100 tons or more of an individual criteria pollutant, with a margin of compliance to assure that the actual emissions of this source are both enforceably and practically constrained to levels below those at which it would be a major source required to have a CAAPP permit.

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

VII. REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that the proposed project meets all applicable state and federal air pollution control requirements. The Illinois EPA is therefore proposing to issue this permit.

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