

**POET, LLC.**  
**Corn Ethanol LCFS Pathway Method 2A Application**  
**(Sub-Pathway 7: Emmetsburg, Gowrie, Jewell, and Lake Crystal Plants)**

**Plant Summary**

Because POET operates a large number of corn ethanol plants that utilize a variety of production technologies, it has received staff approval to group its plants into a series of sub-pathways in its Method 2 applications. This arrangement allows POET to receive Method 2 approval for sub-pathways rather than for individual facilities. Although these sub-pathways may contain individual facilities at the time they are approved, POET may add additional facilities to them later. In order to add a facility to an existing sub-pathway, POET must submit the same categories of data on that facility as it submitted on the previously approved facilities in that sub-pathway. Following approval of that data, POET should register the new facility with the LCFS Biofuel Producer Registration program. POET's original application, submitted in December of 2010, included six sub-pathways. In the application summarized below, POET is seeking approval for a seventh sub-pathway.

POET has included four plants in its Sub-Pathway 7 proposal: Emmetsburg, Gowrie, Jewell, and Lake Crystal. Lake Crystal is located in Minnesota while the other three plants are located in Iowa. All four plants are named after the city in which they reside. All are Midwest, dry mill, natural gas-fired plants that utilize the raw starch hydrolysis (RSH) fermentation process. RSH is an enzyme-based method that reduces the amount of heat required during fermentation and eliminates the liquefaction and saccharification steps. RSH plants generally consume less energy per BTU of ethanol produced than do conventional facilities. The Sub-Pathway 7 facilities produce both wet and dry distiller's grains with solubles (DGS). Because the ratio of dry DGS (DDGS) to wet DGS (WDGS) varies over time at Sub-Pathway 7 plants, POET is seeking separate 100 percent DDGS and 100 percent WDGS pathway carbon intensities (CIs). If, in a given production period, 95 percent of the DGS is dried, 95 percent of the ethanol produced would receive the DDGS CI and the remaining five percent would receive the WDGS CI. Together, the four Sub-Pathway 7 plants produce approximately 247 million gallons of ethanol annually.

**Carbon Intensity of Ethanol Produced**

As shown in Table 1, the applicant is applying for a 100 percent dry DGS CI of 89.76 gCO<sub>2</sub>e/MJ and a 100 percent wet DGS CI of 81.41 gCO<sub>2</sub>e/MJ. Both CIs represent the highest CI value from among the four plants included in Sub-Pathway 7. Proposed Method 2A pathways must be evaluated against reference pathway CIs from the LCFS Lookup table. In the case of Sub-Pathway 7, the reference pathways are two Midwestern, natural-gas-fired, pathways. These pathways differ only in terms of DGS moisture content: the dry DGS pathway has a CI of 98.40 gCO<sub>2</sub>e/MJ while the wet DGS CI is 90.10 gCO<sub>2</sub>e/MJ. The production process for the proposed pathways must not

differ significantly from the production process specified for the reference pathways. The proposed Method 2A pathway CIs must also improve upon the reference pathway CIs by five or more gCO<sub>2</sub>e/MJ.<sup>1</sup> The POET sub-pathways meet these conditions.

POET’s sub-pathways achieve lower CI values relative to the reference pathways through reductions in energy consumption. Thermal energy use at the POET plants is below the 32,328 and 22,430 BTU per gallon energy use values that, respectively, form the basis of the carbon intensities for the reference DDGS and WDGS pathways. Electricity use at these plants is also below the level assumed for the reference pathways (1.08 kw-hr per gallon).<sup>2</sup>

The total thermal energy and electricity use values for these plants will become operating conditions upon approval by the Air Resources Board’s Executive Officer of the proposed pathway carbon intensity values: thermal energy and electricity use shall not exceed the values contained in POET’s Sub-Pathway 7 application (28,001 and 17,843 BTU/gal, respectively, for the dry and wet DGS pathways). None of the plants included in Sub-Pathway 7 can exceed these energy consumption values. Should one or more plants exceed either of these values, no fuel from the non-complying plant shall be sold in California under the Sub-Pathway 7 CI. The Sub-Pathway 7 pathway application must also be re-submitted with the non-complying plants excluded. The dry and wet DGS Sub-Pathway 7 CI values are shown in Table 1.

**Table 1. Proposed Lookup Table Entry for the Sub-Pathway 7 POET Plants**

<b>DGS Type</b>	<b>Fuel/Feedstock</b>	<b>Proposed Lookup Table Pathway Description</b>	<b>Carbon Intensity in gCO<sub>2</sub>e/MJ (Including Indirect Effects)</b>	<b>Do Special Conditions Apply? (Y/N)<sup>1</sup></b>
Dry	Ethanol/Corn	Midwest Dry Mill, 100% Dry DGS; Natural Gas, RSH	89.76	Y
Wet	Ethanol//Corn	Midwest Dry Mill, 100% Wet DGS; Natural Gas, RSH	81.41	Y

<sup>1</sup> The special condition to which this column refers is discussed in the “Carbon Intensity of the Fuel Produced” section of this summary.

<sup>1</sup> In the LCFS regulation, this 5 gCO<sub>2</sub>e/MJ threshold is referred to as the “substantiality requirement.”

<sup>2</sup> Actual plant energy use values are classified as confidential business information and not reported herein.

## **Staff Analysis and Recommendation**

Staff has reviewed the POET Sub-Pathway 7 application and has replicated, using the CA-GREET spreadsheet, the carbon intensity values calculated by POET. POET has provided documentation of each plant's thermal and electrical energy use. Staff is satisfied that the energy values presented in the application accurately represent each plant's actual thermal and electrical energy consumption. Consequently, staff believes that the carbon intensity values of 89.76 and 81.41 gCO<sub>2</sub>e/MJ for the dry and wet DGS pathways, respectively, accurately represent the maximum carbon intensity values of the POET Sub-Pathway 7 plants. Therefore, Staff recommends that the POET application for a Method 2A corn ethanol pathway be approved.