PRELIMINARY DRAFT SUBMITTED FOR PUBLIC COMMENT
APRIL 1, 2011

Siouxland Ethanol Method 2A Pathway Application

Plant Summary

The Siouxland Ethanol (Siouxland) corn ethanol plant is located in Jackson, Nebraska. The Siouxland plant is a dry mill, ICM-designed plant with an ethanol production capacity of about 55 million gallons per year of denatured ethanol. The plant uses both natural gas and landfill gas as fuels. The plant produces both modified distillers grains with solubles (MDGS) with an average moisture content of about 50 percent, and dry distillers grains with solubles (DDGS) with an average moisture content of about 10 percent (moisture content calculated on a dry matter basis). In 2010 about 54 percent of the distillers grains were MDGS, while about 46 percent were DDGS.

Carbon Intensities of Proposed Pathways

Siouxland's Method 2A application contains 14 pathways. Seven are for the production of DDGS, while seven are for MDGS. Individual pathways within each of these two pathway groups differ from each other only by the proportions of landfill and natural gas used in each: for the DDGS pathways, landfill gas usage varies from zero to 16 percent; for the MDGS pathways, the usage range is from zero to 20 percent. Table 1, below, summarizes the land fill gas and natural gas use proportions and the carbon intensity values for the 14 proposed new pathways. The carbon intensity values in the table include a 30 gCO_2e per MJ indirect land use change component.

The Method 2A reference pathway for all 14 of Siouxland's proposed pathways is the "Midwest; Dry Mill, Dry DGS, NG [natural gas]" pathway from the LCFS Lookup Table. The carbon intensity associated with this pathway is 98.4 gCO_2e/MJ. This reference value also applies to plants producing MDGS. Because the proposed carbon intensity values for all of Siouxland proposed pathways are five or more gCO_2e/MJ below the reference pathway CI, the proposed sub-pathways meet the LCFS substantiality requirement.

Table 1: Proposed Lookup Table Entries

Fuel/Feedstock	Proposed Lookup Table Pathway Description	Carbon Intensity in gCO_2e/MJ (Including Indirect Effects)	Do Special Conditions Apply? (Y/N)[1]
Ethanol from Corn	Midwest, Dry-Mill, dry DGS, Natural Gas	88.14	Y
Ethanol from Corn	Midwest, Dry-Mill, dry DGS, Natural Gas, 6% Landfill Gas	85.91	Y
Ethanol from Corn	Midwest, Dry-Mill, dry DGS, Natural Gas, 8% Landfill Gas	85.16	Y
Ethanol from Corn	Midwest, Dry-Mill, dry DGS, Natural Gas, 10% Landfill Gas	84.41	Y
Ethanol from Corn	Midwest, Dry-Mill, dry DGS, Natural Gas, 12% Landfill Gas	83.74	Y
Ethanol from Corn	Midwest, Dry-Mill, dry DGS, Natural Gas, 14% Landfill Gas	83.06	Y
Ethanol from Corn	Midwest, Dry-Mill, dry DGS, Natural Gas, 16% Landfill Gas	82.38	Y
Ethanol from Corn	Midwest, Dry-Mill, Modified DGS, Natural Gas	83.64	Y
Ethanol from Corn	Midwest, Dry-Mill, Modified DGS, Natural Gas, 8% Landfill Gas	81.41	Y
Ethanol from Corn	Midwest, Dry-Mill, Modified DGS, Natural Gas, 10% Landfill Gas	80.66	Y
Ethanol from Corn	Midwest, Dry-Mill, Modified DGS, Natural Gas, 13% Landfill Gas	79.91	Y
Ethanol from Corn	Midwest, Dry-Mill, Modified DGS, Natural Gas, 15% Landfill Gas	79.23	Y
Ethanol from Corn	Midwest, Dry-Mill, Modified DGS, Natural Gas, 18% Landfill Gas	78.56	Y
Ethanol from Corn	Midwest, Dry-Mill, Modified DGS, Natural Gas, 20% Landfill Gas	77.88	Y

The Siouxland sub-pathways achieve lower carbon intensity values relative to the LCFS look-up table reference pathway by two principal means: 1) the plant uses landfill gas as a partial substitute for natural gas, as shown in Table 1, above, and 2) the plant was constructed from an energy-efficient design developed by ICM. Thermal energy use at the Grand Junction plant is below the 36,000 BTU per gallon value that forms the basis of the carbon intensity for the reference dry DGS pathway. Electricity use at the plant is also below the value that is

assumed for the reference pathway (1.08 kw-hr per gallon).[1] A slightly higher plant ethanol yield and shorter corn and ethanol transportation distances provide additional, but smaller, reductions in carbon intensity relative to the LCFS reference pathway carbon intensity.

Operations at the Siouxland plant will be subject to conditions designed to ensure that the carbon intensity values shown in the table above will be met during real-world operations. Four principal operating conditions must be met before Siouxland uses the pathway carbon intensities shown in Table 1. These are as follows:

1. On or before January 1st and July 1st of each year, Siouxland will select, maintain a record of, and report to ARB the two pathways under which it will be operating for the coming six-month period. One of the two pathways will be a DDGS and the other an MDGS pathway.
2. The LFG percentages that apply to the two selected pathways will act as minima: LFG purchase records supplied by Siouxland must show that monthly LFG consumption did not drop below the proportion specified in the applicable pathway description for the entire six-month reporting period.
3. The overall plant energy consumptions during the six-month reporting period will be calculated as an average. That average must be equal to or less than the energy consumption levels used to calculate the pathway CI in the CA-GREET model. Calculating energy consumption for compliance purposes will mirror the CA-GREET calculations, but CA-GREET need not be used to carry them out. The approach can be summarized as follows:

   [Because the applicant has designated this information as confidential, it is not included in this public document]

4. In the event the LFG supply to Siouxland is interrupted within any given six-month period, Siouxland shall make up all carbon deficits during that six-month period by producing a greater amount of MDGS to offset NG usage or by using a higher CI pathway during the subsequent six-month period. After fully offsetting all carbon deficits due to the LFG interruption, any excess carbon credits shall not be carried over for future use. Siouxland shall maintain records in order to document the full offsetting of any LFG interruption carbon deficit occurrences each quarter.

[1] Actual plant energy use values are classified as confidential business information and not reported herein.

Staff Analysis and Recommendation

Staff has reviewed the Siouxland application and has replicated, using the CA-GREET spreadsheet, the carbon intensity values calculated by Siouxland for its 14 proposed pathways. Siouxland has provided documentation for the energy use and ethanol production values used to calculate the carbon intensities for the 14 pathways. Staff is satisfied that the energy values in the application accurately represent the plant's energy value. Staff is satisfied that the electricity use value in the application accurately represents the plant's electricity value. Staff believes that the carbon intensity values calculated by Siouxland are, given the operating conditions described above, sustainable. Consequently, staff believes that the carbon intensity values shown in the table above accurately represent and will continue to represent the carbon intensity values of the Siouxland plant. Therefore, staff recommends that Siouxland's application for a Method 2A corn ethanol pathway be approved.