



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 11 2013

OFFICE OF
AIR AND RADIATION

Mr. Steve McNinch
Chief Executive Officer
Western Plains Energy, LLC.
3022 Cr. 18
Oakley, Kansas 67748

Dear Mr. McNinch:

You requested a determination of whether grain sorghum ethanol produced from Western Plains' proprietary process would qualify as advanced biofuel under the Renewable Fuel Standard Program (RFS). On December 21, 2012 EPA issued a response to this request based on a certain set of assumptions and constraints. This letter supersedes and replaces the previous response and the pathway defined in this letter with the conditions and associated regulatory provisions is the one applicable to the "Western Plains Process" in EMTS.

The Western Plains fuel pathway is not described under the existing approved fuel pathways in the RFS regulations. Through the petition process described under 40 CFR 80.1416, Western Plains submitted data to EPA necessary to perform a lifecycle greenhouse gas analysis of the Western Plains fuel pathway. In conducting our detailed assessment, my staff largely relied on a straightforward application of the same methodology and much of the same modeling used for the final rule published on March 26, 2010 (75 FR 14670) (the "March, 2010 RFS rule") and the subsequent supplemental preamble to the final rule signed on November 30, 2012 establishing pathways for grain sorghum ethanol in Table 1 to 40 CFR 80.1426 (the "Sorghum rule"). The difference between this analysis and the analyses completed for the March, 2010 RFS rule and the Sorghum rule is the evaluation of a modified fuel production process. The attached document "Western Plains Energy LLC Request for Fuel Pathway Determination under RFS" describes the data submitted by Western Plains, the analysis conducted by EPA, and our determination of the lifecycle greenhouse gas emissions associated with the fuel production pathway described in Western Plains' petition.

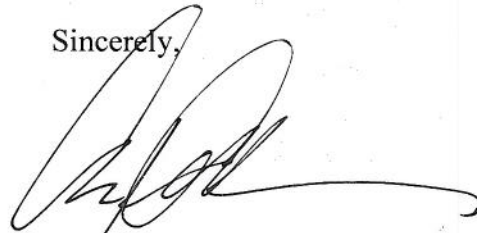
Based on our assessment, fuel produced using the Western Plains pathway with grain sorghum as a feedstock, a dry mill process that uses no more than 0.37 bushels of grain sorghum per gallon of ethanol produced (calculated as a rolling average for all gallons in the batch in question and all gallons for which D Code 5 RINs were generated over the preceding 364-day period), no more than 0.51 kWh of electricity per gallon of ethanol produced for all process electricity (using only electricity from the grid, calculated as a rolling average for all gallons in the batch in

question and all gallons for which D Code 5 RINs were generated over the preceding 364-day period), use of biogas produced from an on-site waste digester for all process energy other than drying co-product distillers grains, and use of either biogas or natural gas for drying no more than 1% of its co-product distillers grains (calculated as a rolling average for all gallons in the batch in question and all gallons for which D Code 5 RINs were generated over the preceding 364-day period), with all other DG (99% or more) sold in wet form qualifies under RFS for Advanced Biofuel (D-code 5) RINs. This is based on Western Plains meeting RFS regulations regarding grain sorghum ethanol production. This approval applies specifically to Western Plains Energy, LLC, and to the process, materials used, fuel produced, and process energy sources as specified in the petition request submitted by Western Plains.

The OTAQ Reg: Fuels Programs Registration and OTAQEMTS: OTAQ EMTS Application will be modified to allow Western Plains to register and generate RINs for the production of ethanol from the above feedstocks using a production process identified in EMTS as "Western Plains Process."

If you have additional questions about this or related issues, please contact Vincent Camobreco of my staff at 202-564-9043.

Sincerely,

A handwritten signature in black ink, appearing to read 'C. Grundler', with a long horizontal flourish extending to the right.

Christopher Grundler, Director
Office of Transportation and Air Quality

Enclosure

Western Plains Energy LLC Request for Fuel Pathway Determination under RFS

Office of Transportation and Air Quality

January 11, 2013

Summary: Western Plains Energy LLC (“Western Plains”) petitioned the Agency to approve their generation of advanced biofuel RINs (D-code 5) under the renewable fuel standard (“RFS”) program for the production of ethanol from grain sorghum. The pathway we have analyzed uses grain sorghum as a feedstock, a dry mill process that uses no more than 0.37 bushels of grain sorghum per gallon of ethanol produced (calculated as a rolling average for all gallons in the batch in question and all gallons for which D Code 5 RINs were generated over the preceding 364-day period), no more than 0.51 kWh of electricity per gallon of ethanol produced for all process electricity (using only electricity from the grid, calculated as a rolling average for all gallons in the batch in question and all gallons for which D Code 5 RINs were generated over the preceding 364-day period), use of biogas produced from an on-site waste digester for all process energy other than drying co-product distillers grains, and use of either biogas or natural gas for drying no more than 1% of its co-product distillers grains (calculated as a rolling average for all gallons in the batch in question and all gallons for which D Code 5 RINs were generated over the preceding 364-day period), with all other DG (99% or more) sold in wet form (the “Western Plains Ethanol Pathway”). For purposes of this petition response, the terms “process energy” and “process electricity” have the same meanings as described in the preamble to the final rule published on December 17, 2012 (77 FR 74592) establishing pathways for grain sorghum ethanol in Table 1 to 40 CFR 80.1426 (the “Sorghum rule”).

Through the petition process described under 40 CFR 80.1416, Western Plains submitted data to EPA to perform a lifecycle greenhouse gas emissions analysis of the Western Plains Ethanol Pathway. This analysis involved a straightforward application of the same methodology and much of the same modeling used for the final rule published on March 26, 2010 (75 FR 14670) (the “March, 2010 RFS rule”) and the subsequent Sorghum rule. The difference between this analysis and the analyses completed for the March, 2010 RFS and the Sorghum rules is the evaluation of a modified fuel production process.

The Western Plains Ethanol Pathway is the type of new pathway that EPA described in the preamble to the March, 2010 RFS rule as capable of being evaluated by comparing the applicant’s fuel pathway to pathway(s) that have already been analyzed. EPA performed its assessment based on the modeling done for the grain sorghum ethanol pathways performed as part of the Sorghum rule (the “RFS grain sorghum ethanol pathways”). The GHG impacts related to grain sorghum feedstock production for the Western Plains ethanol process is slightly lower than the corresponding impacts associated with the grain sorghum ethanol pathways analyzed in the Sorghum rule because the Western Plains ethanol process uses less grain sorghum per gallon of ethanol fuel produced. In addition, the Western Plains ethanol process consumes less total electricity for process electricity needs. The Western Plains ethanol process consumes biogas from an on-site waste digester for all process energy, other than use of natural gas for drying up to 1% of the distillers grains (DG). 99% or more of the DG are not dried, but are instead sold in wet form. Based on the data submitted and the existing modeling for the grain sorghum ethanol pathways in the Sorghum rule, EPA conducted a lifecycle assessment

and determined that the Western Plains Ethanol Pathway achieves a 50% reduction in GHG emissions compared to the gasoline fuel baseline. Based on our assessment, the fuel produced through the Western Plains Ethanol Pathway qualifies for generating RINs for advanced biofuel (D-code 5).

This document is organized as follows:

- *Section I. Required Information and Criteria for Petition Requests:* This section contains information on the background and purpose of the petition process, the criteria EPA uses to evaluate the petitions and the information that is required to be provided under the petition process as outlined in 40 CFR 80.1416. This section is not specific to Western Plains' request and applies to all petitions submitted pursuant to 40 CFR 80.1416.
- *Section II. Available Information:* This section contains background information on Western Plains and describes the information that Western Plains provided and how it complies with the petition requirements outlined in Section I.
- *Section III. Analysis and Discussion:* This section describes the lifecycle analysis done for the Western Plains Ethanol Pathway and identifies how it differs from the analysis done for the grain sorghum ethanol pathway analyzed as part of the Sorghum rule. This section also describes how we have applied the lifecycle results to determine the appropriate D-Code for the Western Plains Ethanol Pathway.
- *Section IV. Conditions and Associated Regulatory Provisions:* This section describes the regulatory provisions associated with this petition.
- *Section V. Public Participation:* This section describes how this petition is an extension of the analysis done as part of the March, 2010 RFS and Sorghum rulemaking.
- *Section VI. Conclusion:* This section summarizes our conclusions regarding Western Plains' petition, including the D-code Western Plains may use in generating RINs for fuel produced using the Western Plains Ethanol Pathway.

I. Required Information and Criteria for Petition Requests

A. Background and Purpose of Petition Process

As a result of changes to the Renewable Fuel Standard program in Clean Air Act ("CAA") Section 211(o) required by the Energy Security and Independence Act of 2007 ("EISA"), EPA adopted new regulations, published at 40 CFR § 80.1400 et. seq. that specify the types of renewable fuels eligible to participate in the RFS program and the procedures by which renewable fuel producers and importers could generate Renewable Identification Numbers ("RINs") for the qualifying renewable fuels they produce through approved fuel pathways. See 75 FR 14670 (March 26, 2010); 75 FR 26026 (May 10, 2010); 75 FR 37733 (June 30, 2010); 75 FR 59622 (September 28, 2010); 75 FR 76790 (December 9, 2010); 75 FR 79964 (December 21, 2010); 77 FR 1320 (January 9, 2012); and 77 FR 74592 (December 17, 2012).

Pursuant to § 80.1426(f) (1) of the RFS regulations:

Applicable pathways. D-codes shall be used in RINs generated by producers or importers of renewable fuel according to the pathways listed in Table 1 to this section, subparagraph 6 of this section, or as approved by the Administrator.

Table 1 to § 80.1426 lists the three critical components of a fuel pathway: (1) fuel type; (2) feedstock; and (3) production process. Each specific combination of the three components, or fuel pathway, is assigned a D-code. EPA may also independently approve additional fuel pathways not currently listed in Table 1 for participation in the RFS program, or a third party may petition for EPA to evaluate a new fuel pathway in accordance with § 80.1416.

The petition process under § 80.1416 allows parties to request that EPA evaluate a new fuel pathway's lifecycle GHG reduction and provide a determination of the D-code for which the new pathway may be eligible. EPA will extend a similar approval to other petitioners utilizing the same fuel pathway as Western Plains upon verification that the pathway is indeed the same, assuming all other requirements are met.

B. Required Information in Petitions

As specified in 40 CFR 80.1416(b)(1), petitions must include all of the following information, and should also include as appropriate supporting documents such as independent studies, engineering estimates, industry survey data, and reports or other documents supporting any claims:

- The information specified under § 80.76 (Registration of refiners, importers or oxygenate blenders).
- A technical justification that includes a description of the renewable fuel, feedstock(s), and production process. The justification must include process modeling flow charts.
- A mass balance for the pathway, including feedstocks, fuels produced, co-products, and waste materials production.
- Information on co-products, including their expected use and market value.
- An energy balance for the pathway, including a list of any energy and process heat inputs and outputs used in the pathway, including such sources produced off site or by another entity.
- Any other relevant information, including information pertaining to energy saving technologies or other process improvements.
- Other additional information as requested by the Administrator to complete the lifecycle greenhouse gas assessment of the new fuel pathway.

In addition to the requirements stated above, parties who use a feedstock not previously evaluated by EPA must also include the following, and should also include as appropriate supporting information such as state, county, or regional crop data, commodity reports, independent studies, industry or farm survey data, and reports or other documents supporting any claims:

- Type of feedstock and description of how it meets the definition of renewable biomass.
- Market value of the feedstock.
- List of other uses for the feedstock.
- List of chemical inputs needed to produce the renewable biomass source of the feedstock and prepare the renewable biomass for processing into feedstock.
- Energy needed to obtain the feedstock and deliver it to the facility. If applicable, identify energy needed to plant and harvest the source of the feedstock and modify the source to create the feedstock.
- Current and projected yields of the feedstock that will be used to produce the fuels.
- Other additional information as requested by the Administrator to complete the lifecycle greenhouse gas assessment of the new fuel pathway.

II. Available Information

A. Background on Western Plains

Western Plains submitted a petition requesting authorization to generate D-code 5 RINs for fuel produced through the Western Plains Ethanol Pathway. A petition is required because the Western Plains Ethanol Pathway is not included as an approved advanced biofuel pathway in Table 1 to §80.1426 of the RFS regulations. Table 1 includes an advanced biofuel pathway for ethanol from grain sorghum, but requires that fuel producers use a combination of dry mill process, using only biogas from landfills, waste treatment plants, and/or waste digesters for process energy and for on-site production of all electricity used at the site other than up to 0.15 kWh of electricity from the grid per gallon of ethanol produced, calculated on a per batch basis. Western Plains uses grain sorghum as a feedstock and a dry mill process, but does not qualify for the existing grain sorghum advanced biofuel pathway in Table 1 to §80.1426 because it uses some natural gas to dry co-product distillers grains, does not produce electricity on-site using biogas, and uses more than 0.15 kWh of electricity from the grid per gallon of ethanol produced.

Ethanol produced pursuant to the Western Plains Ethanol Pathway does qualify under the existing grain sorghum renewable fuel pathway under Table 1 to §80.1426 for the generation of D-Code 6 RINs. That pathway only requires a dry mill process using biogas from landfills, waste treatment plants, and/or waste digesters, and/or natural gas, for process energy. However, Western Plains would like to generate D-Code 5 RINs as an advanced biofuel, so we have considered whether their product satisfies the requirement that advanced biofuel has lifecycle GHG emissions that are at least 50% less than the petroleum fuel replaced.

B. Information Available Through Existing Modeling

A fuel pathway under the RFS regulations is defined by three components: (1) fuel type; (2) feedstock; and (3) production process. For the pathway addressed in Western Plains' petition, Western Plains would use a feedstock that has already been analyzed as part of the Sorghum rule, as noted in

Table 1. As a result, no new feedstock modeling was required as modeling for grain sorghum was already done as part of the Sorghum rule. Similarly, no new emissions impact modeling of using ethanol as a transportation fuel was required as that was already done as part of the March, 2010 RFS rule. This petition only requires EPA to evaluate a modified fuel production process for an existing fuel type.

Table 1: Excerpts of Existing Fuel Pathways from 40 CFR 80.1426

Fuel Type	Feedstock	Production Process Requirements	D-Code
Ethanol	Grain Sorghum	Dry mill process using biogas from landfills, waste treatment plants, and/or waste digesters, and/or natural gas, for process energy	6
Ethanol	Grain Sorghum	Dry mill process, using only biogas from landfills, waste treatment plants, and/or waste digesters for process energy and for on-site production of all electricity used at the site other than up to 0.15 kWh of electricity from the grid per gallon of ethanol produced, calculated on a per batch basis.	5

The same analytical approach that was used to evaluate the lifecycle GHG emissions of the existing pathways noted above was used to analyze the Western Plains Ethanol Pathway. The preambles to the March, 2010 RFS and Sorghum rules describe the modeling approach used to estimate lifecycle GHG emissions from grain sorghum ethanol. The rules describe the models and data used as well as the input and output streams from those models to calculate the emissions for each of the lifecycle stages. To modify the grain sorghum ethanol analysis to reflect the Western Plains Ethanol Pathway, the only change required was replacing the grain ethanol production process data with the Western Plains process data. This resulted in the following changes to the modeling (described in more detail in the following sections):

- Amount of grain sorghum used in the fuel production process decreased to reflect Western Plains' efficiency in terms of bushels of grain sorghum input per gallons of ethanol produced
- Amount of energy used by the fuel production process and associated emissions from fuel production and use changed to reflect Western Plains' data provided in their energy balance

This was a straightforward analysis based on existing modeling done for the March, 2010 RFS and Sorghum rules and substituting Western Plains' proprietary process data, which only altered the amounts of inputs and outputs. The analyses completed for this petition utilizes the same fundamental modeling approach as was used in the March, 2010 RFS and Sorghum rule analyses.

C. Information Submitted by Western Plains

Western Plains has supplied all the required information on their production process that EPA needs to analyze the lifecycle GHG emissions associated with the Western Plains Ethanol Pathway. Information submitted includes a technical justification that has a description of the fuel, feedstocks used, and their proprietary production process with modeling flow charts, a detailed mass and energy balance of the process with information on co-products as applicable, and other additional information as needed to complete the lifecycle greenhouse gas assessment.

III. Analysis and Discussion

A. Lifecycle Analysis

Determining a fuel pathway's compliance with the lifecycle GHG reduction thresholds specified in the CAA for different types of renewable fuel requires a comprehensive evaluation of the renewable fuel, as compared to the gasoline or diesel fuel that it replaces, on the basis of its lifecycle GHG emissions. As mandated by the CAA, the GHG emissions assessments must evaluate the aggregate quantity of GHG emissions (including direct emissions and significant indirect emissions such as significant emissions from land use changes) related to the full lifecycle, including all stages of fuel and feedstock production, distribution, and use by the ultimate consumer.

In examining the full lifecycle GHG impacts of renewable fuels for the RFS program, EPA considers the following:

- Feedstock production – based on agricultural sector models that include direct and indirect impacts of feedstock production.
- Fuel production – including process energy requirements, impacts of any raw materials used in the process, and benefits from co-products produced.
- Fuel and feedstock distribution – including impacts of transporting feedstock from production to use, and transport of the final fuel to the consumer.
- Use of the fuel – including combustion emissions from use of the fuel in a vehicle.

EPA's evaluation of the lifecycle GHG emissions of the Western Plains Ethanol Pathway under this petition request is consistent with the CAA's applicable requirements, including the definition of lifecycle GHG emissions and threshold evaluation requirements. It was based on information regarding Western Plains' production process that was submitted under a claim of Confidential Business Information (CBI) by Western Plains on September 26, 2011 and followed up by numerous

clarifying emails and exchanges. The information provided included the mass and energy balances necessary for EPA to evaluate the lifecycle GHG emissions of the Western Plains Ethanol Pathway.

The lifecycle GHG emissions of fuel produced pursuant to the Western Plains Ethanol Pathway were determined as follows:

Feedstock production – The Western Plains Ethanol Pathway uses grain sorghum as a feedstock for the production of ethanol. As previously noted, grain sorghum is one of the feedstocks already listed in Table 1 to § 80.1426 of the RFS regulations. Since grain sorghum has already been evaluated as part of the Sorghum rule, no new feedstock production modeling was required.

The FASOM and FAPRI models were used to analyze the GHG impacts of the feedstock production portion of the fuel's lifecycle. The same FASOM and FAPRI results representing the emissions from an increase in grain sorghum production that were generated as part of the Sorghum rule analysis of the grain sorghum ethanol pathways were used in this analysis of the Western Plains Ethanol Pathway. These results represent agriculture / feedstock production emissions for a certain quantity of grain sorghum produced. For the analysis in the Sorghum rule, this was roughly 36 million bushels of grain sorghum used to produce 100 million gallons of fuel. We have calculated GHG emissions from feedstock production for that amount of grain sorghum. Western Plains' dry mill fermentation process for converting grain sorghum into ethanol is the same type of process that was modeled as part of the Sorghum rule. Therefore, the existing agricultural sector modeling analyses for grain sorghum as a feedstock remain valid for use in estimating the lifecycle impact of renewable fuel produced using the Western Plains Ethanol Pathway.

For the RFS grain sorghum ethanol pathways, the use of 36 million bushels of grain sorghum resulted in approximately 7,592,400 mmBtu of grain sorghum ethanol produced, based on a yield of 2.71 gallons ethanol per bushel of grain sorghum and a lower heating value (LHV) of 76,000 Btus per gallon of ethanol. The FASOM and FAPRI agricultural sector GHG results were divided by the total energy value of fuel produced to get emissions per mmBtu of ethanol.

Western Plains provided, as part of the information claimed CBI, their process yield in terms of gallons of fuel produced per bushel of grain sorghum. Based on the data, Western Plains' process yield is slightly more efficient than the pathways modeled as part of the Sorghum rulemaking in terms of gallons of ethanol produced per bushel of grain sorghum used. Therefore, compared to the grain sorghum ethanol pathways already analyzed, the Western Plains process results in 1% more Btus of fuel produced for the same amount of grain sorghum feedstock. The FASOM and FAPRI results were scaled down by 1% compared to the RFS grain sorghum results to yield feedstock production emissions for the Western Plains Ethanol Pathway.

The scaling down of the agricultural sector results impacted several components of the Western Plains fuel lifecycle analysis. It impacted feedstock production, direct and indirect emissions as well as the indirect land use change emissions. The following components were impacted:

- Domestic Livestock
- Domestic Farm Inputs and Fertilizer N₂O
- Domestic Rice Methane
- Domestic Land Use Change
- International Livestock
- International Farm Inputs and Fertilizer N₂O
- International Rice Methane
- International Land Use Change

Overall, compared to the RFS grain sorghum ethanol pathways, the feedstock production component of the Western Plains Ethanol Pathway is more efficient, meaning that there is less land use change (with associated greenhouse gas emissions) and lesser agricultural sector impacts per Btu of fuel produced. Table 2 highlights the differences between the agricultural and land use change results of the Western Plains Ethanol Pathway and the grain sorghum ethanol pathways analyzed in the Sorghum rule.

Table 2: Comparison of Agricultural Sector and Land Use Change Impacts for Western Plains Ethanol and Grain Sorghum Ethanol Analyzed in Sorghum Rule

Lifecycle Stage	Sorghum Rule Grain Sorghum Ethanol (g CO ₂ -eq./mmBtu)	Western Plains Ethanol (g CO ₂ -eq./mmBtu)
Domestic Livestock	-1,798	-1,815
Domestic Farm Inputs and Fertilizer N ₂ O	8,714	8,618
Domestic Rice Methane	577	571
Domestic Land Use Change	-2,786	-2,755
International Livestock	-917	-907
International Farm Inputs and Fertilizer N ₂ O	6,772	6,697
International Rice Methane	-649	-642
International Land Use Change (<i>Low/High</i>)	30,406 (18,982/44,689)	30,073 (18,774/44,200)
Total Feedstock Production Emissions:	40,318	38,839

Fuel production – Western Plains’ fuel production method involves the production of ethanol from grain sorghum in a dry mill process. The amount of energy used by Western Plains is different than production methods that were analyzed under the Sorghum rule.

To analyze the GHG impacts of Western Plains' ethanol pathway, EPA utilized the same approach that was used to determine the impacts of processes in the grain sorghum ethanol pathway analyzed in the Sorghum rule, taking into account the differences noted above. The GHG emissions for the fuel production component of the Western Plains Ethanol Pathway were based on an assessment of the type and amount of energy used and associated emissions per mmBtu of fuel produced.

The amount and type of energy used was taken from information submitted to EPA on Western Plains' mass balance and energy balance. Western Plains submitted energy data on biogas from an on-site waste digester (in mmBtus), natural gas (in mmBtus) and grid electricity (in MWhs) inputs, as well as gallons of fuel produced. Western Plains based their biogas use in the energy balance on the heat required for process energy. The biogas is sourced from an on-site waste digester, utilizing primarily manure from a local feedlot as well as other organic wastes. Their natural gas use was based on energy for drying distillers grains. The electrical energy amount was based on use for process electricity.

Western Plains' process uses less energy than the grain sorghum ethanol processes analyzed in the Sorghum rule, which results in a reduction in GHG emissions.

The emissions from the use of energy were calculated by multiplying the amount of energy by emission factors for fuel production and combustion, based on the same method and factors used in the March, 2010 RFS and Sorghum rulemakings. The emission factors for the different fuel types are from GREET and were based on assumed carbon contents of the different process fuels. As was the case in the Sorghum rule, there were no upstream production emissions assumed for biogas from the waste digester and biogas combustion emissions were limited to methane and N₂O. Table 3 below summarizes the emission factors used in the RFS analysis.

Table 3: Fuel Production Emission Factors for Biogas from a Waste Digester, Natural Gas, and Electricity in 2022

Fuel Type	RFS (g CO₂-eq./mmBtu)
Natural Gas Production	9,392
Natural Gas Combustion	59,183
Biogas Combustion	364
Electricity	219,824

Individual process input and output mass and energy flows within the production plant were not needed for this analysis; rather, as was done for the March, 2010 RFS and Sorghum rulemakings analysis, total input and output mass and energy flows from the entire plant were used. No additional raw materials were required in the Western Plains ethanol process and thus no additional emissions were calculated for raw materials for this analysis.

The Western Plains Ethanol Pathway produces co-product DG. The grain sorghum ethanol pathways analyzed in the sorghum rule included an estimate for DG co-product production which we similarly applied to the Western Plains production process. Since DG production impacts the agricultural markets, such inclusion was modeled as part of the FASOM and FAPRI modeling as already described in the feedstock production section, above. Thus no additional co-product credits are applied for the fuel production stage of the analysis.

The estimated production emissions from the Western Plains ethanol process are shown below in Table 4.

Table 4: Fuel Production Emissions for Western Plains Ethanol w/ 10% Dry DG

Fuel Production Source	Western Plains Ethanol (g CO₂-eq./mmBtu)
On-Site Emissions	135
Upstream (natural gas and electricity production)	5,076
Total Fuel Production Emissions:	5,211

Fuel and feedstock distribution – We used the same feedstock distribution emissions assumption considered for grain sorghum ethanol under the Sorghum rule for Western Plains’ grain sorghum feedstock. The fuel type, ethanol, and hence the fuel distribution for ethanol, was already considered as part of the March, 2010 RFS rule. Therefore, the existing feedstock and fuel distribution lifecycle GHG impacts for grain sorghum ethanol were applied to our analysis of the Western Plains Ethanol Pathway.

Use of the fuel – Western Plains’ ethanol pathway produces a fuel that was analyzed as part of the March, 2010 RFS rule. Thus, the fuel combustion emissions calculated as part of the March, 2010 RFS rule for ethanol were applied to our analysis of the Western Plains Ethanol Pathway.

Western Plains’ fuel was then compared to baseline gasoline, using the same value for baseline gasoline as in the March, 2010 RFS rule analysis. The analysis indicates that the Western Plains Ethanol Pathway would result in a GHG emissions reduction of 50% compared to the gasoline it would replace, as shown in Table 5.

B. Application of the Criteria for Petition Approval

Western Plains’ petition request involved a fuel pathway with a modified production process, using similar feedstocks and producing a fuel product already considered as part of the March, 2010 RFS and Sorghum rules. Western Plains provided all the necessary information that was required for this type of petition request.

Based on the data submitted and information already available through analyses conducted for the March, 2010 RFS and Sorghum rules, EPA conducted a lifecycle assessment and determined that the Western Plains Ethanol Pathway would meet the 50% lifecycle GHG threshold requirement specified in the CAA for advanced biofuel.

The Western Plains Ethanol Pathway results in a 50% reduction in GHG emissions compared to the gasoline baseline. These results justify authorizing the generation of advanced biofuel RINs for fuel produced by the Western Plains Ethanol Pathway, assuming that the fuel meets the other definitional criteria for renewable fuel (e.g., produced from renewable biomass, and used to reduce or replace petroleum-based transportation fuel, heating oil or jet fuel) specified in the CAA and EPA implementing regulations.

Table 5 below breaks down by stage the lifecycle GHG emissions for the Western Plains Ethanol Pathway, the advanced biofuel grain sorghum ethanol pathway analyzed as part of the Sorghum rule, and the 2005 gasoline baseline. This table demonstrates the contribution of each stage in the fuel pathway and its relative significance in terms of GHG emissions.

**Table 5: Lifecycle GHG Emissions for Western Plains Ethanol Pathway, 2022
(g CO₂-eq./mmBtu)**

Fuel Type	Grain Sorghum Ethanol, Produced in Plants that Use Only Biogas (from Landfills, Waste Treatment Plants, and Waste Digesters) for Process Energy and On-site Electricity Production, Except for 0.15 kWh of Electricity from the Grid per Gallon of Ethanol Produced and 100% Dry DG	Western Plains Ethanol Pathway	RFS 2005 Gasoline Baseline
Net Agriculture (w/o land use change), Domestic and International	12,698	12,522	
Land Use Change, Mean (Low/High), Domestic and International	27,620 (16,196/41,903)	27,317 (16,019/41,445)	
Fuel Production	1,612	5,211	19,200
Fuel and Feedstock Transport	4,276	3,614	*
Tailpipe Emissions	880	880	79,004
Total Emissions, Mean (Low/High)	47,086 (35,662/61,369)	49,545 (38,246/63,672)	98,204
Midpoint Lifecycle GHG Percent Reduction Compared to Petroleum Baseline	52%	50%	

*Emissions included in fuel production stage.

IV. Conditions and Associated Regulatory Provisions

The Sorghum rule includes specific RIN generation, registration, recordkeeping and reporting requirements that were designed to ensure that RINs are only generated for qualifying grain sorghum-based fuel, and that EPA receives sufficient information to enable it to fulfill its oversight and enforcement role with respect to renewable fuel produced from grain sorghum. EPA interprets these requirements to also be applicable to Western Plains when producing fuel pursuant to the Western Plains Ethanol Pathway. Specifically, Western Plains must, to the extent applicable, comply with: 40 CFR §§ 80.1426(f)(13), 80.1450(b)(1)(ix)(A)(1)-(5), 80.1451(b)(1)(ii)(S)(1)-(5), and 1454(k)(2). EPA will interpret 40 CFR § 80.1450(b)(1)(ix)(A)(5) consistent with today's approval, such that to register to produce fuel pursuant to the Western Plains Ethanol Pathway, Western Plains must provide a description of how the facility intends to demonstrate and document that no more than 0.51 kWh of grid electricity is used per gallon of ethanol produced, calculated on a per batch basis, at the time of RIN generation. Western Plains' registration materials shall identify any physical constraints that may allow natural gas to be used only for drying distillers grains, and shall include a calculation of the volume of natural gas required to dry up to 1% DG on an annual basis. Western Plains shall include in its registration materials a detailed description of components of its process powered by electricity and those for which biogas will supply process energy. Western Plains is also subject to the general registration, recordkeeping and reporting provisions in 40 CFR subpart M that apply to renewable fuel producers. In addition, the authority for Western Plains to generate RINs pursuant to this petition approval for any batch of fuel is expressly conditioned on Western Plains demonstrating through records available as of the date of RIN generation and maintained by the producer that the batch of ethanol used to generate the RINs met the following requirements:

1. Grain sorghum was used as a feedstock;
2. The ethanol was produced by a dry mill process;
3. No more than 0.37 bushels of grain sorghum were used per gallon of ethanol produced, calculated as an average across the sum of all gallons of ethanol produced in the batch plus all gallons in other batches for which RINs were generated pursuant to the Western Plains Ethanol Pathway in the preceding 364 days;
4. No more than 0.51 kWh of electricity from the grid per gallon of ethanol produced was used for all process electricity, calculated as an average across the sum of all gallons of ethanol produced in the batch plus all gallons in other batches for which RINs were generated pursuant to the Western Plains Ethanol Pathway in the preceding 364 days;
5. Biogas produced from an on-site waste digester was used for all process energy other than for drying DG;
6. No more than 1% of its co-product distillers grains were dried, calculated as an average across the sum of all gallons of ethanol produced in the batch plus all gallons in other

batches for which RINs were generated pursuant to the Western Plains Ethanol Pathway in the preceding 364 days; and

7. Only natural gas and/or biogas were used to dry co-product distillers grains.

If Western Plains fails to comply with this demonstration requirement, or fails to meet the elements of the approved Western Plains Ethanol pathway for any batch of fuel for which it generates RINs pursuant to this pathway, all RINs generated for the affected batches shall be considered improperly generated under 40 CFR 80.1431(a).

V. Public Participation

The definition of advanced biofuel in CAA 211(o)(1) specifies that the term means renewable fuel, other than ethanol derived from corn starch, that has lifecycle greenhouse gas emissions, as determined by the Administrator, after notice and opportunity for comment, that are at least 50 percent less than baseline lifecycle greenhouse gas emissions. As part of the March, 2010 RFS and Sorghum rulemakings, we took public comment on our lifecycle assessment of the grain sorghum ethanol pathways, including all models used and all modeling inputs and evaluative approaches. We acknowledged in the proposal for the March, 2010, RFS rulemaking that it was unlikely that our final regulations would address all possible qualifying fuel production pathways, and we took comment on allowing the generation of RINs using a temporary D-code in certain circumstances while EPA was evaluating such new pathways and updating its regulations. After considering comments, we finalized the current petition process, where we allow for EPA approval of certain petitions without going through additional rulemaking if we can do so as a reasonably straightforward extension of the existing modeling, whereas rulemaking would be conducted to respond to petitions requiring significant new modeling. See 58 FR 14797 (March 26, 2010).

In responding to this petition, we have relied on the overall lifecycle methodology outlined in the March, 2010 RFS rule, as well as the grain sorghum ethanol modeling that we conducted for the Sorghum rule, and have simply adjusted the analysis to account for Western Plains' production process. This includes relying on the same agricultural sector modeling (FASOM and FAPRI results) that was conducted and commented on as part of the Sorghum rule to represent feedstock production. This also includes use of the same emission factors and types of emission sources that were used in the March, 2010 RFS rule analysis. Thus, the fundamental analyses relied on for this decision have been made available for public comment as part of the March, 2010 RFS and Sorghum rulemakings, consistent with the reference to notice and comment in the statutory definition of "advanced biofuel." Our approach today is also consistent with our description of the petition process in the preamble to the March, 2010 RFS rule, as our work in responding to the petition was a logical extension of analyses already conducted.

VI. Conclusion

Based on our assessment, fuel produced using the Western Plains Ethanol Pathway qualifies under the CAA for advanced biofuel (D-code 5) RINs, assuming that the fuel meets the other definitional criteria for renewable fuel (e.g., produced from renewable biomass, and used to reduce or replace petroleum-based transportation fuel, heating oil or jet fuel) specified in the CAA and EPA implementing regulations.

This approval applies specifically to Western Plains Energy LLC. EPA will extend a similar approval to other petitioners utilizing the same fuel pathway as Western Plains upon verification that the pathway is indeed the same, assuming all other requirements are met. This approval is effective as of signature date. The Western Plains Ethanol Pathway does not meet the requirements for delayed RINs outlined in 80.1426(g) because the complete petition was not received by EPA by January 31, 2011, as required by 80.1426(g)(1)(i)(A).

The OTAQ Reg: Fuels Programs Registration and OTAQEMTS: OTAQ EMTS Application will be modified to allow Western Plains to register and generate RINs for the production of ethanol from grain sorghum feedstock using a production process of “Western Plains Process.”