

Application No. B0189

Updated: 04/30/2021 (See Underlined Text)

Staff Summary

REG Geismar, LLC
Geismar, LA

Renewable Naphtha and Renewable Propane from Distillers' Corn Oil, Used Cooking Oil, and Rendered Animal Fat

Deemed Complete: 03/17/2021
Posted for Comment: 03/23/2021
Certified and Posted: 4/30/2021
CI Effective: 1/1/2021
Fuel Pathway Codes: See Below

PATHWAY SUMMARY

REG Geismar, LLC (Geismar) has applied for fuel pathways for renewable naphtha and renewable propane derived from distillers corn oil, used cooking oil and rendered animal fat feedstock and processed at their facility in Geismar, LA. Geismar sources rendered inedible animal fat from an integrated meatpacking and rendering facility owned by Sanimax¹ in Montreal, Quebec Canada and Green Bay, Wisconsin USA. Each Sanimax facility is a joint applicant with Geismar on this application.

The feedstock is pretreated at the Geismar facility to remove impurities which could deactivate catalyst or impact product yields. The feedstock is then hydrotreated in a reactor to produce both liquid and gaseous products. The liquid stream is distilled to produce renewable diesel and renewable naphtha. The gaseous streams are renewable propane and light hydrocarbons. Process energy used includes grid electricity and natural gas.

Sanimax Tallow Rendering Pathway

This application includes site-specific rendering process energy values² for inedible animal fat sourced from the two Sanimax facilities. All energy data for the facility are collected from dedicated meters and supporting information to enable assigning of appropriate emissions to the rendering operation. Rendering emissions are assigned proportionally between rendered animal fat and meal products using mass-based allocation.

¹ <https://www.sanimax.com/>

² Deemed confidential by the joint applicant

CARBON INTENSITIES OF RENEWABLE NAPHTHA AND RENEWABLE PROPANE PATHWAYS

Well-to-wheel GHG emissions of this pathway were modelled using the Tier 1 Simplified Carbon Intensity Calculator for Biodiesel and Renewable Diesel modified to accommodate the use of liquid hydrogen in the pre-treatment and fuel production process. The table lists the proposed Carbon Intensities (CIs) for these pathways.

Proposed Pathway Carbon Intensities

Pathway No.	Feedstock and Fuel	Fuel Pathway Code	Pathway Description	Total CI (gCO2e/MJ)
<u>B018901</u>	Distillers corn oil to renewable naphtha	<u>RNT003B01890100</u>	Renewable naphtha produced from distillers corn oil and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	33.00
<u>B018910</u>	Distillers corn oil to renewable propane	<u>LPG029B01891000</u>	Renewable propane produced from distillers corn oil and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	33.00
<u>B018903</u>	North America used cooking oil to renewable naphtha	<u>RNT002B01890300</u>	Renewable naphtha produced from North America used cooking oil and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	26.00
<u>B018911</u>	North America used cooking oil to renewable propane	<u>LPG029B01891100</u>	Renewable propane produced from North America used cooking oil and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	26.00
<u>B018904</u>	US non-rendered used cooking oil to renewable naphtha	<u>RNT001B01890400</u>	Renewable naphtha produced from non-rendered U.S sourced used cooking oil and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	20.50
<u>B018912</u>	US non-rendered used cooking oil to renewable propane	<u>LPG029B01891200</u>	Renewable propane produced from non-rendered U.S sourced used cooking oil and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	20.50
<u>B018905</u>	South America used cooking oil to renewable naphtha	<u>RNT001B01890500</u>	Renewable naphtha produced from South America used cooking oil and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	26.50
<u>B018913</u>	South America used cooking oil to renewable propane	<u>LPG029B01891300</u>	Renewable propane produced from South America used cooking oil and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	26.50
<u>B018902</u>	North America rendered inedible animal fat to renewable naphtha	<u>RNT002B01890200</u>	Renewable naphtha produced from North America animal fat and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	37.50

<u>B018914</u>	North America rendered inedible animal fat to renewable propane	<u>LPG029B01891400</u>	Renewable propane produced from North America animal fat and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	37.50
<u>B018906</u>	South America rendered inedible animal fat to renewable naphtha	<u>RNT002B01890600</u>	Renewable naphtha produced from South America animal fat and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	38.50
<u>B018915</u>	South America rendered inedible animal fat to renewable propane	<u>LPG029B01891500</u>	Renewable propane produced from South America animal fat and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	38.50
<u>B018907</u>	Asia Pacific rendered inedible animal fat to renewable naphtha	<u>RNT002B01890700</u>	Renewable naphtha produced from Asia Pacific animal fat and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	43.50
<u>B018916</u>	Asia Pacific rendered inedible animal fat to renewable propane	<u>LPG029B01891600</u>	Renewable propane produced from Asia Pacific animal fat and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	43.50
<u>B018908</u>	Sanimax Montreal rendered inedible animal fat to renewable naphtha	<u>RNT002B01890800</u>	Renewable naphtha produced from Sanimax Montreal sourced animal fat and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	27.00
<u>B018917</u>	Sanimax Montreal rendered inedible animal fat to renewable propane	<u>LPG029B01891700</u>	Renewable propane produced from Animal Montreal animal fat and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	27.00

<u>B018909</u>	Sanimax Green Bay rendered inedible animal fat to renewable naphtha	<u>RNT002B01890900</u>	Renewable naphtha produced from Sanimax Green Bay animal fat and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	28.50
<u>B018918</u>	Sanimax Green Bay rendered inedible animal fat to renewable propane	<u>LPG029B01891800</u>	Renewable propane produced from Sanimax Green Bay animal fat and shipped to California via ocean tanker; natural gas, grid electricity and hydrogen	28.50

OPERATING CONDITIONS

The certified CI values in the above table may be used to report and generate credits for fuel quantities that are produced at the facility in the manner described in the applicant’s LCA report, and dispensed for transportation use in California, subject to the following requirements and conditions:

REG Geismar Operating Conditions (Fuel Pathway Holder)

1. Fuel pathway holders and Joint Applicants are subject to the requirements of the California Air Resources Board’s (CARB) Low Carbon Fuel Standard (LCFS) regulation, which appears at sections 95480 to 95503 of title 17, California Code of Regulations. Requirements include ongoing monitoring, reporting, recordkeeping, and third-party verification of operational CI and a controlled process for providing product transfer documents or other similar records to counterparties or CARB. All specified source feedstocks reported in the fuel production process must meet chain-of-custody requirements specified in section 95488.8(g)(1)(B).

2. Moisture content of feedstock is subject to monitoring, reporting, and verification. Either the representative method or the conservative method may be used. The representative method calculates monthly values for weighted average moisture content from financial transaction records or internal measurements by the fuel producer. The conservative method assumes feedstock moisture content is zero, based on the lower value of the range for allowable moisture content specified by purchase contract as <1%.

3. Pursuant to the LCFS Regulation section 95488.2(a), each UCO collection facility considered to be a “Hub” or headquarters facility shall be registered as an intermediate facility in the Alternative Fuels Portal, and is subject to a verifier site visit, as it is supplying site-specific data for CI determination. The fuel pathway applicant / pathway holder(s) shall provide a list of all “Spokes” or satellite UCO collection facilities in their annual fuel pathway report, along with direct or indirect volumes of UCO delivered from each satellite location. The VB will conduct a verification site visit to each “Hub” or headquartered facility and additionally complete a risk-based assessment to determine how many other “Spoke” or satellite UCO collection facilities need to be verified for the

annual CI validation. Criteria for the risk-based satellite facility sampling plan shall be based upon, but not be limited to, the following:

- a. Quantity of UCO procured from each one of the satellite facilities
- b. Quality of the UCO feedstock delivered to the “Hub” facility (eg, moisture content, type of grease, etc.)
- c. Material misbalances, suspect volumes, or quantities of UCO received by the “Hub” facility that could not be reconciled in the annual report
- d. Professional judgement of the VB or lead verifier
- e. A request by CARB that the VB audit a specific “Spoke” or satellite facility based on any criteria specified.

4. The applicant shall use in-line Gas Chromatography (GC) analyses for the representative LHV of the light hydrocarbons, pursuant to the standard operating condition for sampling and analysis of co-products below. The applicant may use results derived on a higher heating value (HHV) basis only when a conversion factor to convert to a lower heating value (LHV) basis is approved by CARB.

5. The applicant shall develop a sampling and analysis plan for all relevant user-defined LHV inputs according to the CARB approved operating condition, as specified below. This Operating Condition is applicable to user-defined input values for co-products in Field 2.16.a: “Conversion Factor from HHV to LHV for Light Hydrocarbon” and Field 2.17.a: “Energy Density of other co-products” (LHV, Btu/lb) of the ‘RD-Production’ tab in the Tier 1 Simplified CI Calculator for BDRD. These input values shall be determined by Gas Chromatography (GC) analyses or other CARB approved method (e.g. correlation between LHV and specific gravity of renewable naphtha), and shall be reported as a Representative Value, or a Conservative Value with the following constraints, respectively:

- a. The Representative Value of Energy Density shall be based upon CARB’s approved sampling and analysis plan used to determine the user-defined input value for the Energy Density of renewable naphtha and propane co-produced and exported for sale under this fuel pathway. The applicant’s proposed sampling and analysis plan shall take into account the variability of the facility-specific material attribute in selecting the sampling method, frequency of analysis or measurements, and the calculation method used to determine the composite, representative, user-defined input value. Results derived on a higher heating value (HHV) basis shall be converted to a lower heating value (LHV) basis using a factor approved by CARB. Inputs must be site-specific: results from one facility’s co-product analysis may not be reported in applications or Annual Fuel Pathway Reports for any other facility’s pathways.

- b. The Conservative Value for Energy Density is the lowest result of GC analyses or other CARB approved method (correlation between LHV and specific gravity of renewable naphtha) reduced by a conservative margin of 5 percent. Lower values for co-product energy density reduce co-product credit and correspond to higher, more conservative, CI values. The value may be determined from analysis of an initial subset of facility-specific results provided to CARB at the time of application. The applicant must demonstrate that the selected value is conservative, relative to analyses of the facility’s specific material and peer

reviewed literature values for the material. The fuel pathway will be certified with an operating condition requiring a minimum sampling and analysis frequency, to be determined during the certification process on the basis of the initial subset of results provided with the application package. If any analysis results in a lower value than the approved conservative value, the user-defined input value must be updated in the subsequent Annual Fuel Pathway Report. A fuel pathway holder may transition from a conservative value to a representative value for the subsequent Annual Fuel Pathway Report if approved by CARB prior to the report due date.

Sampling and Analysis Plan:

The applicant shall develop a sampling and analysis plan for each fuel production facility, to demonstrate to CARB the validity of composited values used for all relevant user-defined inputs. At a minimum, the proposed sampling and analysis plan shall include the following:

- a. Description of the material attribute(s) specified for all relevant user defined inputs (e.g., Energy Density LHV (Btu/lb) of the co-product streams (renewable naphtha, renewable propane and light hydrocarbon).
- b. The properties (e.g., composition, vapor pressure, density etc.) of the co-product streams.
- c. The proposed sampling frequency, given as a number of samples per time period and per unit of fuel produced (e.g., every 100,000 gallons), to monitor the material attribute and its variability. The applicant must indicate the method of compositing collected samples with due consideration to changes in production cycles (batch runs, or continuous), changes in type of feedstock, seasonal availability of feedstocks, and disruptions to the production process (startup and shutdown).
- d. Documentation of analytical results must identify the samples by date, type, location, and fuel production batch.
- e. The test methods employed (standard or industry recognized) shall be described for all analytical measurements to support the use of a composited value for a user defined input.
- f. Individual GC test results shall be averaged per the stated frequency (i.e. time period) in the Sampling and Analysis plan. Averages and variance shall be provided for each time period reviewed, and individual GC test reports shall be provided as requested by the verification body or CARB.

Sanimax Specific Operating Conditions (Joint Applicant)

1. 1. Fuel pathway holders and Joint Applicants are subject to the requirements of the California Air Resources Board's (CARB) Low Carbon Fuel Standard (LCFS) regulation, which appears at sections 95480 to 95503 of title 17, California Code of Regulations. Requirements include ongoing monitoring, reporting, recordkeeping, and third-party verification of operational CI and a controlled process for providing product transfer documents or other similar records to counterparties or CARB. All specified source feedstocks reported in the fuel production process must meet chain-of-custody requirements specified in section 95488.8(g)(1)(B).

2. The applicant shall provide rendering energy use (electricity, natural gas, and residue oil) for verification, as specified in the CARB-approved list of site-specific inputs.
3. Emissions associated with rendering are determined by a mass allocation between the tallow and meat meal using metered temperature and flow data. The quantities of raw animal fats, rendered tallow and co-product meal must be reported for verification, as specified in the CARB-approved list of site-specific inputs.

Staff Analysis and Recommendation

Staff has reviewed the application and has replicated the CI values calculated by the applicant using the modified version of the Tier 1 Simplified CI Calculator for Biodiesel and Renewable Diesel as well as the modified CA-GREET3.0 model. On the basis of this finding, CARB staff recommends that this application for a LCFS Tier 2 pathway stated in above table be posted for public comments as detailed in Section 95488.7(d)(5). After close of the public comment period, the applicant shall be required to address any substantive comments as determined by the Executive Officer. Any changes required based on comments received will be the responsibility of the applicant. Only after the Executive Officer has deemed responses to comments to be satisfactory, shall this pathway be deemed eligible for certification.

Comments and Certification

CARB has reviewed the applicant's response to comments received during the 10-day comment period, determined that these adequately address factual and methodological errors, and certified the pathway.