

BEFORE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. G-9, Sub 698
DOCKET NO. G-9, SUB 810

In the Matter of:)
) **APPLICATION OF CARDINAL**
Application to Participate in) **BIO ENERGY, LLC FOR APPROVAL**
Piedmont Natural Gas Company) **TO PARTICIPATE IN APPENDIX F**
Inc.'s Appendix F Pilot Program) **PILOT PROGRAM**
)

Pursuant to Rule R1-5 of the North Carolina Utilities Commission's (the "Commission") Rules of Practice and Procedure, and the Commission's June 19, 2018 Order, Approving Appendix F to Piedmont Natural Gas Company, Inc.'s North Carolina Service Regulations and establishing a Pilot Program to evaluate the distribution and use of Renewable Natural Gas (the "Appendix F Order"), Cardinal Bio Energy, LLC ("Cardinal" or the "Applicant") hereby applies for approval to participate in the pilot program established in the Appendix F Order ("Pilot Study").¹ For the reasons discussed below, Cardinal also respectfully requests that the Commission expedite approval of this application. In support of these requests, Cardinal states as follows:

A. THE APPLICANT

1. Cardinal is a Delaware limited liability company. It is an affiliate of Roeslein Alternative Energy, LLC ("RAE"), an alternative energy project developer, owner, and operator based in Saint Louis, Missouri. RAE has over 10 years of experience building and operating systems that capture swine farm lagoon gas ("biogas") and process the biogas into renewable natural gas ("RNG"). RAE's portfolio in Missouri includes six (6) state-of-art RNG processing facilities serving multiple swine growing operations in the state.

¹ Renewable natural gas or RNG is referred to as "Alternative Gas" in the June 19, 2018 Order where Alternative Gas is defined broadly to include RNG from most sources. See, Docket No. G-9, Sub 698, *Order Approving Appendix F and Establishing Pilot Program* (June 19, 2018).

2. Cardinal presently is in the process of developing an RNG project that will serve fifteen (15) swine farms located near Maxton, North Carolina. Cardinal plans to harvest biogas at these farms, purify the gas to meet the Appendix F gas quality standards and then deliver the RNG to Piedmont Natural Gas Company, Inc. (“Piedmont”) at an approved interconnection location for distribution on Piedmont’s system. Cardinal is also evaluating the viability of three program expansion phases in the Maxton/Laurinburg area that, if launched, would incorporate as many as 28 additional farms.

3. Biogas is a natural gas consisting mostly of methane generated by the decomposition of organic matter, in this case, swine manure. Historically, swine manure was stored in lagoons that, typically, were neither covered nor lined. The gas produced from the decomposing manure would generally escape as fugitive emissions into the ambient atmosphere and add to the atmospheric load of methane and other greenhouse gases (“GHGs”). Indeed, at one time it was estimated that the agricultural sector was responsible for nearly 36 percent of the methane emissions in the United States and that manure management alone was responsible for nearly 26 percent of those emissions. It also was not uncommon for the materials held in unlined lagoons to migrate downwards impacting the groundwater and, in some cases, reaching surface water when the groundwater discharged into nearby streams, ponds or other waterbodies. Cardinal’s projects mitigate these problems significantly. The lagoons are covered to create an enclosed anaerobic environment. This change facilitates the anaerobic digestion of the swine manure and accelerates the production of biogas. Additionally, the lagoon covers capture fugitive emissions that otherwise would contribute to the atmospheric load of methane and other GHGs. Lagoon covers also reduce odor at and around the farm, reduce the presence and residence of insects and prevent potential breaches or overflows that could occur during storm events.

Put simply, the management and design changes attendant to the production of biogas at swine farms are positive developments in and of themselves and added benefits accompanying the production of RNG.

4. The biogas produced at the farms will be collected in underground biogas piping and routed to a common processing location (the “Gas Upgrading Facility”) on one of the farms. There the biogas will be upgraded to meet the gas quality standards in Appendix F. The upgraded gas (RNG) will then be transported by CNG trucks to a nearby Piedmont gas main injection location (the “Injection Facility”). Assuming both timely approval of Cardinal’s application and construction of the Injection Facility, Cardinal expects to commence operations in late 2023.

5. At the outset, Cardinal will deliver up to 1,400 dekatherms per day (Dth/day) of pipeline quality RNG to Piedmont’s system. Eventually the delivered amount may increase to a maximum of 6,000 Dth/day. Cardinal and Piedmont have agreed on a proposed interconnection location and are currently negotiating a Receipt Interconnect Agreement that should be finalized in the near term. Cardinal has informed Piedmont that it is filing this Application to participate in the Pilot Study and Piedmont has informed Cardinal that it has no objection to this filing. All of the RNG delivered to Piedmont for distribution will have been contracted for and sold to one or more counterparties that are Piedmont customers in North Carolina.

B. NOTICES AND COMMUNICATIONS

1. Correspondence and filings that are made in connection with this Application should be sent to:

Kurt J. Olson
P.O. Box 10031
Raleigh, North Carolina 27605
Tel: (919) 916-7221
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and,

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Cardinal, and both of the parties identified above agree to electronic service.

C. REQUEST FOR APPROVAL TO PARTICIPATE IN PILOT STUDY

1. The Appendix F Order and the Commission's decision to initiate and later extend the Pilot Study, reflect a general concern that at the time Appendix F was proposed, the Commission, the local distribution companies and the end users did not have much experience with RNG, and had only limited knowledge of the potential effects that introducing RNG into the local natural gas mix would have on pipeline structural integrity, safety and product quality. This concern was compounded by industry representations that in some instances, end users might receive a mix of natural gas dominated by RNG. Thus, in the absence of relevant experience and information on potential impacts, the Commission decided in the Appendix F Order to establish a three-year Pilot Study to evaluate the impacts, if any, of introducing RNG into the distribution system, with emphasis on structural integrity, safety and end use product quality. As part of the Pilot Study, the Commission required Piedmont and the participating RNG developers to conduct extensive testing on the RNG entering the distribution system and to submit periodic reports indicating the volume of RNG supplied to the pipeline for distribution, the quality of the gas and any reported impacts to the local system and end use arising from introducing RNG.

2. Initially, two RNG projects were "grandfathered" into the Pilot Study. The Appendix F Order required other RNG developers who wished to supply RNG to the local market through the local distribution system to apply for inclusion in the Pilot Study, with the keystone for acceptance being whether the applicant's project would augment the information and data being collected by

either (a) presenting data and information from a new source of RNG, *e.g.*, data on the effects of RNG produced from waste water treatment sludge, or (b) providing supplemental or missing data and information needed to assure that there would be sufficient reliable data and information upon which to base informed decisions and conclusions. To date, the Commission has approved nine (9) projects to participate in the Pilot Study, including the original two (2) grandfathered projects. Only two of those projects have commenced operations. As described by the Commission in a recent order, the volume of RNG supplied to the local distribution pipeline and the corresponding amount of data and information generated, has been “relatively small.” *See e.g.*, Docket No. G-9, Sub 698, *Order Requiring Information on the Status of Renewable Natural Gas Projects* (March 31, 2022) (“March 31, 2022 Order”). Indeed, given the limited amount of data and information collected through the Pilot Study, the Commission decided at the end of the initial three-year study period to extend the Pilot Study for an additional three (3) years. *See* Docket No. G-9, Sub 698, *Order Extending Renewable Gas Pilot Programs, Amending Regulations and Requiring Report* at 10 (September 8, 2021) (concluding that the data and information collected to date was not sufficient to reach informed conclusions regarding the impact on pipeline integrity, safety and end use resulting from introducing Appendix F compliant RNG to the gas supply). Moreover, the Commission also found that all of data and information generated in the Pilot Study came from one source of RNG, swine manure and swine waste byproducts, and even here the data base was not sufficient to support any final decisions on RNG from this source. *Id.* (noting insufficient data). *See also*, March 31, 2022 Order at 2.

D. THE CARDINAL PROJECT

1. The RNG produced at the Cardinal facility will be derived from swine manure and will conform in all respects with the standards in Appendix F. Data collected in the Pilot Study thus far, albeit limited, strongly suggest that RNG produced from this source and conforming to the Appendix F requirements is safe and presents no risk of harm to Piedmont’s distribution system

or its customers use of the gas. The additional data and information generated from the Cardinal projects will be "useful" and will broadly augment the existing data and information thereby creating a data base sufficient to allow the Commission to validate and confirm once and for all, the affirmative findings generated thus far regarding RNG from swine waste.

2. Cardinal understands that other entities producing RNG from swine waste have been approved to participate in the pilot program, but as noted above, only two projects are delivering RNG to Piedmont from this source and even here, the processes and source material are not alike. One project produces RNG from swine waste and the other uses food processing waste. Accordingly, the "small" data base created thus far is really even smaller than it may appear when looking at RNG from swine waste alone. For improved statistical sampling purposes then, Cardinal's project will provide additional valuable data points. The new information will amplify lessons learned thus far, and enhance and strengthen the data and information upon which the Commission ultimately will base its decisions and conclusions.

3. Moreover, Cardinal's projects present several unique characteristics not shared by other projects accepted into the Pilot Study. Cardinal will deploy a *proprietary* biogas-upgrade, aggregated, technology package not used in other cases. This technology package improves RNG production and upgrade efficiency and has the added benefit of significantly reducing source air pollutants.

4. Cardinal's biogas project also will deploy a unique "hub and spoke" delivery model where multiple locations will transport, by CNG truck, finished RNG to the Injection Facility. Should this "hub and spoke" method prove viable, it will extend the reach of potential farm participation and should increase economies of scale for the Cardinal projects and others like it that may follow. In short, the Cardinal projects will (a) provide additional and necessary data to evaluate impacts of swine waste based-RNG on the distribution system and customer use; (b) provide new

data and information on unique and advanced processing technology; and (c) generate data and information on a new production and delivery model not evaluated before. As such, Cardinal believes that its projects are precisely the kind the Commission had in mind when opening the Pilot Study to projects that will be “useful” in gathering information and data on RNG and the impact it has, if any, on the gas delivery system and customer’s use.

5. Cardinal and Piedmont have engaged in extensive negotiations over the terms and conditions of an RNG Agreement and anticipate that it will be finalized shortly. An injection point has been selected at a location near in Laurinburg, NC, in Scotland County. Piedmont has completed engineering studies that confirm the technical feasibility of receiving RNG at this injection location and along this segment of the distribution system in the volume Cardinal plans to produce and deliver. The advanced status of this project and the likelihood it will commence operations within the existing term of the extended Pilot Study present the real possibility that relevant, useful and necessary data to support conclusions and decisions will be generated in the near term and no further extensions of the Pilot Study will be required, at least for RNG from swine waste, or if an additional extension is deemed necessary, it can be limited to a very short period. The volume of data and information from the Cardinal projects, when coupled with other projects, should be adequate to make informed decisions soon after operations are commenced.

6. The data collected to date suggest that RNG from Cardinal’s projects will be safe and perform the same as other gas on Piedmont’s delivery system. The benefits from the Cardinal projects include acquiring necessary confirming data, testing new and unique technologies, and evaluating new distribution schemes. These benefits are quite substantial particularly given the many animal farm lagoons across North Carolina. The data generated also will be instructive and beneficial for comparing different sources of RNG and in that way help to advance an emerging RNG alternative energy sector in North Carolina.

E. PUBLIC POLICY CONSIDERATIONS

1. Public policy considerations weigh in favor of including the Cardinal project in the Pilot Study.

2. Both EPA's Renewable Fuels Standard and North Carolina's Renewable Energy and Energy Efficiency Portfolio Standard ("REPS"), N.C. Gen. Stat. § 62-133.8, encourage, as a matter of public policy, the productive use of renewable energy resources. The REPS goes further and specifically identifies swine waste as an indigenous, renewable energy source to be developed and promoted. *Id.* § 62-133.8(e). RNG from swine waste has emerged as a leading source for implementing these public policies and is now very much on the verge of becoming a viable component of the State's energy mix. RNG from swine waste not only constitutes a new, indigenous, renewable energy resource, but also necessitates the application of new and highly beneficial ways of on-farm management practices. The modifications attendant to the production of biogas from swine manure mitigate air emissions of GHGs, and as mentioned above, Cardinal's proprietary technology also actively reduces air pollution. The on-farm modifications also control potential groundwater and surface water pollution, and help control local problems with odors, infestation, and overflows during unusual storm events. These are very positive developments. It also should be emphasized that RNG is typically used as a substitute for conventional natural gas, and results in zero carbon loading. That is, when all is said and done, capturing, formulating and using RNG as opposed to conventional natural gas, reduces atmospheric loading of GHGs and this too advances and benefits the public policy to reduce such emissions. Until human interaction, conventional natural gas is sequestered below ground where it would remain. When the gas is extracted, however, most likely by fracking, it is transported and ultimately used, generally to produce power. Every molecule released during this life-cycle of conventional natural gas is new and every new molecule released during its extraction, transportation and use adds to the

atmospheric load. That does not occur in the case of RNG from swine waste. All constituents, including carbon dioxide (“CO₂”), are pulled from the atmosphere by plants via photosynthesis. The plants or the related components are fed to swine and then excreted with the swine waste. The waste is placed in lagoons that Cardinal covers to facilitate anaerobic digestion. Molecules that in the past would have escaped as “fugitive emissions” are captured and processed with other collected materials. The biogas produced is further processed into RNG meeting the applicable quality standards of Appendix F. It is then distributed to end users. When that RNG is used, the emissions contain less constituents of concern, principally CO₂, than were taken out of the atmosphere via photosynthesis to begin with, resulting in a carbon negative loop. In a carbon constrained environment, this feature of RNG is critical and highly beneficial.

3. The Cardinal projects, at full build out, will result in approximately \$30 million invested in Robeson County, a Tier 1 County in need of economic development. The project will provide jobs during construction and afterwards, support the local service industry and increase the local tax base. The overall effect on Robeson County will be positive from a financial standpoint and an improvement to the local quality of life.

4. Finally, Cardinal has invested considerable time, energy and resources into this project. Not proceeding, or waiting until the Pilot Study is over, would not only inure to the financial detriment of Cardinal, but also adversely affect local subcontractors, vendors and other businesses in North Carolina. As the Commission previously stated in this docket, G-9, Sub 698, and restated when approving the RNG standard for the Public Service Company of North Carolina, Inc. in Docket No. G-5, Sub 606, if the use of the natural gas distribution system "can be done while holding natural gas customers harmless, [the case here], then every effort should be made to accommodate interconnections with [RNG] providers."

CONCLUSION

For all of the foregoing reasons, Cardinal Bio Energy, LLC, respectfully requests that the Commission approve its participation in the Appendix F Pilot Study.

Respectfully submitted, this the 27th day of July, 2022.


By: /s/
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VERIFICATION


STATE OF MISSOURI

COUNTY OF ST. LOUIS

I, being first duly sworn, depose and state that I am Chris Roach at Cardinal Bio Energy, LLC and do hereby declare that I am authorized to act on its behalf. I have read the Application of Cardinal Bio Energy, LLC for Approval to Participate in the Appendix F Pilot Program and affirm that the matters and statements contained therein are true and accurate to the best of my personal knowledge and belief.


Chris Roach

Sworn and subscribed before me this the 13th day of July,
2022


Notary

My Commission Expires:

DAWN M. NULL
Notary Public, Notary Seal
State of Missouri
Jefferson County
Commission # 1 1531060
My Commission Expires 02-12-
2026

CERTIFICATE OF SERVICE

I hereby certify that a true and exact copy of the foregoing document was duly served upon counsel of record for the Public Staff and all parties to this docket by either depositing the same in a depository of the United States Postal Service, first-class postage prepaid, addressed as shown below, or by electronic delivery.

This the 27th day of July, 2022.

_____/s/_____

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