



JAN 14 2020

Mr. Chris Roach
President
Roeslein Alternative Energy, LLC
9200 Watson Road, Suite 200
St. Louis, MO 63126

RE: New Source Review Permit Amendment – Permit Number: 122018-015A
Project Number: 2019-10-018; Installation Number: 211-0025

Dear Mr. Roach:

Roeslein Alternative Energy, LLC (RAE) operates an existing biogas collection, cleaning, and compression system at Smithfield Hog Production of Missouri's Valley View Farm in Sullivan County. There are currently fourteen swine waste lagoons with impermeable geomembrane gas collection covers that provide an oxygen deficient environment to facilitate anaerobic digestion and produce biogas. The biogas is then collected in underground piping and sent to cleaning equipment, where the methane is separated out and compressed.

Construction Permit No. 122018-015 was issued to RAE in December of 2018, which authorized the installation of three tail gas flares to control emissions from the non-product tail gas leaving the membrane upgrading system; however, RAE is proposing a design change that requires the installation of a 1,200 scfm thermal oxidizer instead of the flares. The thermal oxidizer, using propane as a pilot fuel, will combust the collective tail gas stream exiting the membrane upgrading system, which will achieve the same result as the flares combusting the individual streams. The operating rate of the thermal oxidizer will remain limited by the biogas generation rate.

During the initial permitting process for Construction Permit No. 122018-015, RAE made conservative assumptions regarding the amount of biogas that would be generated during peak generation periods. The hydrogen sulfide (H₂S) in the biogas was required to be controlled by flares, which generated sulfur oxides (SO_x) in exceedance of the intermediate source threshold. This required the installation to model SO_x emissions and obtain a Part 70 Operating Permit. Since Construction Permit No. 122018-015 has been issued, RAE has been collecting data to better define annual biogas generation rates. Table 1 provides a summary of the measured data compared to the original projections from Construction Permit No. 122018-015.

Table 1: Updated Biogas Generation Data

Operating Period	Original Projection		Update from Measured Data	
	Duration	Generation Rate	Duration	Generation Rate
Normal	205 day/yr	35 scfm	205 day/yr	45 scfm
Peak	70 day/yr	150 scfm	70 day/yr	121 scfm
Winter	90 day/yr	≤ 5 scfm	90 day/yr	≤ 5 scfm

The biogas itself was assumed to have the same composition parameters as originally projected. Analysis of the updated biogas generation data along with these parameters shows that slightly more biogas is generated during normal periods and less biogas is generated during the peak period, compared to the original projections. This yields a decrease in overall potential emissions. Specifically, this shows that the amount of H₂S generated is less than originally projected, and subsequently, the amount of SO_x generated due to combustion is less.

Table 2 provides an updated summary of emissions resulting from the project. Existing potential emissions were taken from Construction Permit No. 122018-015 (Phase III). Existing actual emissions were taken from the installation's most recent EIQ. Updated potential emissions of the installation were calculated using the same methods as described in Construction Permit No. 122018-015, but with the updated biogas generation data and the use of a thermal oxidizer in place of the tail gas flares.

Table 2: Emissions Summary (tons per year)

Pollutant	De Minimis Level	Existing Potential Emissions	Existing Actual Emissions (2018 EIQ)	Updated Potential Emissions of the Installation
PM	25.0	0.21	N/D	0.18
PM ₁₀	15.0	0.21	0.68	0.18
PM _{2.5}	10.0	0.21	0.68	0.18
SO _x	40.0	72.93	17.39	57.75
NO _x	40.0	1.33	4.10	1.57
VOC	40.0	0.15	3.26	0.16
CO	100.0	4.83	30.05	4.67
H ₂ S	10.0	N/D	N/D	1.61
Total HAPs	25.0	0.01	0.03	0.01

N/D = Not Determined

As shown in Table 2, potential emissions of all criteria pollutants except for SO_x are below de minimis levels after using the updated biogas parameters and the thermal oxidizer. The updated SO_x emissions are above the de minimis level but below 100 tons per year; therefore, RAE is no longer required to obtain a Part 70 Operating Permit, as specified in Construction Permit No. 122018-015.

All special conditions from Construction Permit No. 122018-015 have been superseded and updated to reflect current operations at the installation. Although new equipment is being installed and a few emission rates/release parameters at the installation are changing, the ambient air quality modeling performed for the installation in the previous construction permit does not need to be updated. It was determined that the results of SO_x modeling, summarized in the memo: *Ambient Air Quality Impact Analysis (AAQIA) for Roeslein Alternative Energy of Missouri, LLC – Valley View Farm – Sullivan County Site – 2017-03-084*, will not be impacted in a negative manner. The overall SO_x emission rate is decreasing as a result of this project, and the change in release parameters is not expected to notably affect the ambient impact of SO_x. Because the modeling input values for SO_x were considered overly-conservative in Construction Permit No. 122018-015 and the results were still significantly below the NAAQS, it was concluded that there is no risk to the NAAQS being exceeded as a result of this project.

Mr. Roach
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If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, 131 West High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.oa.mo.gov/ahc.

If you have any questions regarding this amendment, please contact the Air Pollution Control Program at P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM



Kendall B. Hale
Permits Section Chief

KBH:rsa

Enclosures

c: Northeast Regional Office
PAMS File: 2019-10-018

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted to the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (3)(E). "Conditions required by permitting authority."

Roeslein Alternative Energy, LLC – Valley View
Sullivan County (S3, T62N, R18W)

1. **Superseding Condition**
The conditions of this permit supersede all special conditions in Construction Permit No. 122018-015, previously issued by the Air Pollution Control Program.
2. **Control Device Requirement – Thermal Oxidizer**
 - A. Roeslein Alternative Energy, LLC shall control emissions from the membrane upgrading system using a thermal oxidizer (EP-18), as specified in the permit application.
 - B. The thermal oxidizer must be in use at all times when the membrane upgrading system are operating and producing tail gas.
 - C. The thermal oxidizer shall be operated and maintained in accordance with the manufacturer's specifications, which shall be kept on site.
 - D. The operating temperature of the thermal oxidizer shall be continuously monitored and recorded during operation. The operating temperature shall be maintained at a minimum of 1,425 °F (averaged each minute).
 - E. Roeslein Alternative Energy, LLC shall maintain an operating and maintenance log for the thermal oxidizer, which shall include the following:
 - 1) Incidents of malfunction with impact on emissions, date and duration of event, probable cause, and corrective actions
 - 2) Maintenance activities with inspection schedule, repair actions, replacements, etc.
3. **Control Device Requirement – Lagoon Flares**
 - A. Roeslein Alternative Energy, LLC shall control emissions from the lagoons using lagoon flares (EP-01 through EP-14), as specified in the permit application.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- B. The lagoon flares shall be operated and maintained in accordance with the manufacturer's specifications, which shall be kept on site.
 - C. Roeslein Alternative Energy, LLC shall maintain an operating and maintenance log for the lagoon flares, which shall include the following:
 - 1) Incidents of malfunction with impact on emissions, date and duration of event, probable cause, and corrective actions
 - 2) Maintenance activities with inspection schedule, repair actions, replacements, etc.
4. Operational Requirements
- A. Roeslein Alternative Energy, LLC shall divert the biogas collected by the lagoon covers to the membrane upgrading system and the thermal oxidizer or the lagoon flares at all times. The biogas shall not be emitted directly into the atmosphere, except during periods of equipment maintenance or for safety considerations, which shall not exceed 40 MMscf per consecutive 12-month period.
 - B. Roeslein Alternative Energy, LLC shall demonstrate compliance with Special Condition 4.A by keeping a record of the amount of biogas emitted directly into the atmosphere. These records shall contain, at a minimum, the following information:
 - 1) Installation name & ID number
 - 2) Permit number
 - 3) Date of direct biogas emission event (month, day year)
 - 4) Duration of direct biogas emission event (hours)
 - 5) Biogas generation rate during direct emission event (scfm)
 - 6) Reason for direct biogas emission
 - 7) 12-month rolling total of direct biogas emissions (MMscf)
 - 8) Direct biogas emission limit (40 MMscf per year)
5. Sampling Requirements
- A. Roeslein Alternative Energy, LLC shall sample the biogas to determine the H₂S concentration.
 - B. The H₂S concentration shall not exceed 0.25% by volume.
 - C. Roeslein Alternative Energy, LLC shall collect one sample from each lagoon every calendar quarter.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- D. Sampling shall be performed using an approved EPA method or a method approved by the Air Pollution Control Program, including the use of a Landtec Biogas 5000 or equivalent unit.
 - E. During the first and/or fourth calendar quarters (January through March and/or October through December), if less than 5 scfm of biogas is being generated on a daily average basis, Roeslein Alternative Energy, LLC will not be required to sample the biogas during that quarter.
 - F. If any of the sampling results show an exceedance of the value in Special Condition 5.B, Roeslein Alternative Energy, LLC shall submit ambient impact modeling results to show that the potential SO_x emissions do not exceed the NAAQS.
 - G. If Roeslein Alternative Energy, LLC cannot show compliance with Special Condition 5.F, they shall contact the Air Pollution Control Program for further instructions.
 - H. After at least 4 biogas sample collections have been performed, Roeslein Alternative Energy, LLC may petition the Air Pollution Control Program to change the sampling frequency if compliance is demonstrated with Special Condition 5.
6. Record Keeping and Reporting Requirements
- A. Roeslein Alternative Energy, LLC shall maintain all records required by this permit for not less than five years and shall make them available to any Missouri Department of Resources' personnel upon request.
 - B. Roeslein Alternative Energy, LLC shall report to the Air Pollution Control Program's Compliance/Enforcement Section at P.O. Box 176 Jefferson City, MO 65102, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.