Statement of Basis
Sand Valley Landfill Gas to Energy (LFGTE) Power Station
Collinsville, AL
703-0045

On August 5, 2024, the Department received applications from Bio Energy (Alabama) LLC, for a renewal of the Sand Valley Landfill Gas to Energy Power Station's (LFGTE Power Station) Major Source Operating Permit (MSOP) for three stationary spark ignition internal combustion engines (ICE) fueled with landfill gas at their facility and a landfill gas treatment system. The facility is located at the Sand Valley Municipal Solid Waste Landfill in Collinsville, Alabama and is under separate ownership from the landfill. The facility uses a landfill gas treatment system, and three spark ignition four stroke engines designed for gaseous fuels and uses lean burn combustion. The continuous power rating is 1,600 ekW with approximately 2242 brake horsepower for each engine.

The facility originally began operations in 2014. The initial Title V MSOP was issued on February 6, 2020, and this is the first renewal. The current MSOP expired on February 5, 2025, but a renewal application was received on August 1, 2024. ADEM Admin. Code r. 335-3-16-12(c) states "If a timely and complete application for a permit renewal is submitted, but the Department fails to take final action to issue or deny the renewal permit before the end of the term of the previous permit, then the permit shall not expire until the renewal permit has been issued or denied and any permit shield granted for the permit shall continue in effect during that time"; therefore, the current MSOP was administratively continued.

The facility is located in Dekalb County, which is in compliance with all National Ambient Air Quality Standards (NAAQS).

There are no ongoing enforcement actions against the LFGTE Power Station necessitating additional requirements to achieve compliance with the proposed permit conditions. The enforcement and compliance history for the facility can be found at https://echo.epa.gov/ (Search using Facility ID AL0000000104900045).

Changes
Since the last issuance of the MSOP, a requirement to include carbon monoxide (CO) emissions in the semi-annual reports and a chapter to include the treatment system requirements have been added.

Operations
The facility uses landfill gas generated by the landfill as its fuel source. The landfill has a design capacity greater than 2.5 million megagrams or 2.5 million cubic meters and is, therefore, a major source by category as stated under the Federal Rules for Municipal Solid Waste Landfills listed in 40 CFR Part 62, Subpart OOO. Furthermore, the landfill's nonmethane organic compound (NMOC) emissions have exceeded 50 Mg per year; therefore, it operates a permitted gas collection and control system (GCCS) with an open flare as required by Subpart OOO and 40 CFR Part 63, Subpart AAAA. The landfill is not a major source of emissions of any criteria or hazardous air pollutants (HAPs) with the exception of CO. The LFGTE Power Station diverts gas from the flare to the treatment system and engines, and the flare has become a supplemental air emission control device.

Treatment System
Upon receipt of the landfill gas, the power station first routes the gas through a treatment system that includes filtration, de-watering, and compression. There are no exhaust points. However, until the landfill gas has been through the treatment system it is still subject to portions of 40 CFR Part 62, Subpart OOO and 40 CFR 63, Subpart AAAA. There are also no bypass valves on the treatment system. If landfill gas cannot be accepted by the power plant, it is routed to the landfill's flare.

Three 2242 Brake Horsepower, Spark Ignition, Stationary Internal Combustion Engines
After the landfill gas passes through the treatment system, it is used to fuel three spark ignition stationary internal combustion engines, each with 2242 brake horsepower. These engines generate electricity that is then sold back to the local power grid.

Emissions/Monitoring
Emissions from the ICEs are primarily nitrogen oxide (NO_x), CO, sulfur dioxide (SO_2), particulate matter (PM), volatile organic compounds (VOCs), and HAPs. The facility has potential emissions of CO and potential emissions of NOx above the major source threshold of 100 tons per year. Potential emissions of all other criteria pollutants would not exceed 100 tons per year. The facility's potential emissions of the HAP formaldehyde exceed the limit for individual HAPs of 10 tons per year, and the potential emissions of combined HAPs exceed 25 tons per year.

Emissions were calculated using factors provided by the manufacturer and AP-42 factors when other factors were not available. The LFGTE Power Station has a plant-wide emission limit of 246.8 tons per year for CO emissions. This limit was established in the facility's original Air Permits issued on May 16, 2012. Emissions were calculated based on 8,760 hours of operation at maximum horsepower. Table 1 below lists the estimated potential emissions from the ICEs.

Table 1 Potential Emissions (tpy)

Pollutant	Generator 1	Generator 2	Generator 3	Total
NOx	64.82	64.82	64.82	194.46
CO	82.34	82.34	82.34	247.02
SO_2	1.1	1.1	1.1	3.3
PM	3.37	3.4	3.4	10.09
PM_{10}	3.37	3.4	3.4	10.09
VOC	21.62	21.6	21.6	64.85
Formaldehyde	9.1	9.1	9.1	27.3
HAP (total)	10.07	10.07	10.07	30.22

Table 2 Actual Emissions for 2023 (tpy)

Pollutant	Generator 1	Generator 2	Generator 3	Total
NOx	8.9	8.49	10.26	27.65
CO	56.31	59.07	54.02	169.4
SO_2	0.93	0.93	0.79	2.65
PM	2.51	2.51	2.13	7.15
PM_{10}	2.51	2.51	2.13	7.15
VOC	2.45	3.27	2.96	8.68

Formaldehyde	5.16	5.06	4.73	14.95
HAP (total)	5.18	5.08	4.75	15.01

Requirements
The entire facility is subject to the Title V permitting program.

Emission Unit No. 001: Three (3) 2242 Brake Horsepower, Spark Ignition, Stationary Internal Combustion Engines

New Source Performance Standards (NSPS)
The engines are subject to the NSPS found in 40 CFR Part 60.4230 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines and are required by 60.4233(e) to meet emission standards for field testing listed in Table 1 to the subpart. The facility voluntarily imposes a limit of 3.8 g/HP-hr for CO instead of the 5.0 g/HP-hr to limit total emissions of CO to less than 250 tons per year. This limit was requested in the original Air Permit applications based on stack testing of the same model engine at other facilities owned by parent company Energy Developments, Inc. Because the facility is subject to 60.4233(e), it is also subject to the compliance requirements listed in 60.4243(b)(2)(ii). This section requires the facility to keep a maintenance plan and records of conducted maintenance. 60.4243(b)(2)(ii) also requires the facility to perform continued performance testing every 8,760 hours or 3 years, whichever comes first, in order to demonstrate compliance. 60.4245 requires the facility to keep records of all notifications submitted in order to comply with Subpart JJJJ, maintenance conducted on the engines, and documentation that the engines meet emission standards.

Maximum Achievable Control Technology (MACT)
The engines are subject to the Reciprocating Internal Combustion Engine (RICE) MACT as listed in 40 CFR Part 63.6580, (Subpart ZZZZ). However, because the engines are fueled with landfill gas, the facility is exempt from the emission and operating limitations, according to 40 CFR Parts 63.6590(b)(2) and 63.6640(e). 63.6625(c) and 63.6655(c) require the facility to monitor and record fuel usage daily, and 63.6650(g) requires the facility to submit an annual report detailing the fuel flow rate and heating values used in calculations, a demonstration that the consumption of landfill gas accounted for at least 10% of the fuel consumption annually, the permit operating limits and any deviations, and any problems or errors with the meters.

Emission Unit No. 002: Landfill Gas Treatment System

NSPS
The landfill, which generates the landfill gas used as fuel, is subject to 40 CFR Part 62, Subpart OOO, including the requirements for controlling landfill gas. However, the landfill fulfills these requirements by complying with the National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR Part 63, Subpart AAAA regarding municipal solid waste landfills.

MACT
The Landfill's NMOC emissions have exceeded 50 megagrams per year; therefore, the landfill is also subject to the NESHAP 40 CFR 63, Subpart AAAA. The landfill is currently meeting the requirements for collection and control of landfill gas in Subpart AAAA. Both Subpart OOO and

AAAA allow for landfill gas to be controlled by a treatment system and provide guidelines for how it should be operated and monitored. Treatment systems are prohibited from venting treated landfill gas to the atmosphere and are required to control any treated landfill gas that cannot be routed to the engines by using one of the other two options in 63.1959(b)(2)(iii)(A) or (B). All emissions from any atmospheric vent from the landfill gas treatment system are also subject to the requirements of 63.1959(b)(2)(iii)(A) or (B). This includes the applicable emission and operational requirements of 63.1957(a), 63.1958(f), and 63.1960(e), as well as the applicable monitoring and testing requirements of 63.1961(g), the record-keeping requirements of 63.1983(2), and the reporting requirements of 63.1981(h)(3) regarding free venting of emissions. 63.1958(f) requires the control system to be operated at all times when collected gas is routed to the system.

Prevention of Significant Deterioration (PSD)
The operations at the LFGTE Power Station are not listed under ADEM Admin Code 335-3-14-.04(2)(a); thus, the applicable threshold for New Source Review (NSR) permitting is 250 tons per year. Since CO emissions are being limited to 246.8 tons per year and the potential emissions of all other regulated NSR pollutants from this operation are below the major source threshold of 250 tons per year, the facility is considered a synthetic minor source with respect to PSD and a PSD review is not required. The emission limit is found in Section 2, Proviso 1 of Unit 001 of the permit.

Monitoring
The LFGTE Power Station maintains records on site of a maintenance plan, maintenance performed, and daily fuel usage with 40 CFR Part 60, Subpart JJJJ and Subpart ZZZZ, as well as a site-specific monitoring plan to show compliance with 40 CFR Part 62, Subpart OOO and 40 CFR Part 63, Subpart AAAA. A report of CO emissions will be required to be submitted to the Department on a semi-annual basis. The facility also performs emission testing of the engines every 8,760 hours of operation to ensure compliance with emissions limits.

CAM
Compliance Assurance Monitoring (CAM) is not applicable because the LFGTE Power Station is subject to MACT standards that were promulgated after November 15, 1990. According to 40 CFR 64.2(b)(1)(i) on exemptions from CAM, emission limitations or standards proposed after November 15, 1990 pursuant to section 111 or 112 of the Clean Air Act are exempt from CAM requirements, and there are no other source specific standards applicable to this facility.

Fugitive Dust
The fugitive dust potential was evaluated and is not expected to be of concern at this facility. The plant property is grassed, and the parking area is covered by gravel or concrete. All travel areas are controlled by the landfill, which already has dust control requirements in its permit. No stockpiles of dust producing materials are planned. Therefore, it has been determined by the Department that a dust plan is not required at this time.

Recordkeeping and Reporting Requirements
The LFGTE Power Station is required to keep records of daily fuel usage, copies of notifications and reports submitted to comply with 40 CFR Part 60, Subpart JJJJ, and maintenance conducted on each engine. These records will be evaluated by the Department during the annual inspection. The facility is required to submit a semi-annual report detailing fuel flow rate, heating values used

in calculations, a statement that only landfill gas was used as fuel, any deviations from permit limits, any problems or errors suspected with the meters, the number of times parameters for the treatment system are exceeded, and a description and duration of all periods when the treatment system wasn't operating and gal was not able to be diverted to the landfill flare.

Recommendations

Based on the applications received, required State and Federal Regulations, and the above information, I recommend that Sand Valley Landfill Gas to Energy Power Station be issued a renewal of Major Source Operating Permit 703-0045 for its Stationary Internal Combustion Engines #1, #2, and #3 and its landfill gas treatment system.

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John Robert Gill
Chemical Branch
Air Division

July 23, 2025
Date