PERMIT AMENDMENT NO. 4911-185-0115-V-02-1
ISSUANCE DATE:

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

Air Quality - Part 70 Operating Permit Amendment

Facility Name: **Bio Energy (Georgia II) LLC**

Facility Address: **2995 Wetherington Lane**
Valdosta, Georgia 31601, Lowndes County

Mailing Address: **3322 West Avenue, Suite 115**
Nashville, Tennessee 37203

Parent/Holding Company: **Energy Developments, Inc.**

Facility AIRS Number: **04-13-185-00115**

In accordance with the provisions of the Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq and the Georgia Rules for Air Quality Control, Chapter 391-3-1, adopted pursuant to and in effect under the Act, the Permittee described above is issued a construction permit for:

The construction and operation of one 1.6 MW landfill gas-fired internal combustion engine.

This Permit Amendment shall also serve as a final amendment to the Part 70 Permit unless objected to by the U.S. EPA or withdrawn by the Division. The Division will issue a letter when this Operating Permit amendment is finalized.

This Permit Amendment is conditioned upon compliance with all provisions of The Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq, the Rules, Chapter 391-3-1, adopted and in effect under that Act, or any other condition of this Amendment and Permit No. **4911-185-0115-V-02-0**. Unless modified or revoked, this Amendment expires upon issuance of the next Part 70 Permit for this source. This Amendment may be subject to revocation, suspension, modification or amendment by the Director for cause including evidence of noncompliance with any of the above; or for any misrepresentation made in App No. 24006 dated **September 27, 2016** and App. No. 45954 dated **March 8, 2017**; any other applications upon which this Amendment or Permit No. **4911-185-0115-V-02-0** are based; supporting data entered therein or attached thereto; or any subsequent submittal or supporting data; or for any alterations affecting the emissions from this source.

This Amendment is further subject to and conditioned upon the terms, conditions, limitations, standards, or schedules contained in or specified on the attached **10** pages.

STATE OF GEORGIA
CONSTITUTION
WISDOM
JUSTICE
MODERATION
1776

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Richard E. Dunn, Director
Environmental Protection Division

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PART 1.0 FACILITY DESCRIPTION

1.3 Process Description of Modification

Bio Energy (Georgia II) LLC is a power generation facility located at the Advanced Disposal Pecan Row Landfill. The power facility currently consists of three LFG-fueled, lean burn, internal combustion engines rated at 1.6 megawatts each. LFG from the Pecan Row Landfill and Evergreen Landfill GCCSs is routed to Bio Energy (Georgia II) LLC for use in the engines. The LFG received from the landfills is routed to a LFG treatment system to remove water and other contaminants. The treated LFG is then burned in the engines to produce electricity for sale. This permit is for the addition of a forth 1.6 megawatt LFG-fired engine.

PART 3.0 REQUIREMENTS FOR EMISSION UNITS

Note: Except where an applicable requirement specifically states otherwise, the averaging times of any of the Emissions Limitations or Standards included in this permit are tied to or based on the run time(s) specified for the applicable reference test method(s) or procedures required for demonstrating compliance.

3.1.1 Modified Emission Units

Emission Units		Specific Limitations/Requirements		Air Pollution Control Devices	
ID No.	**Description**	**Applicable Requirements/Standards**	**Corresponding Permit Conditions**	**ID No.**	**Description**
GEN1	Generator No. 1 Caterpillar G3520C (2,233 HP)	40 CFR 60 Subpart A 40 CFR 60 Subpart JJJJ 40 CFR 63 Subpart A 40 CFR 63 Subpart ZZZZ 391-3-1-.02(2)(b) 391-3-1-.02(2)(g)	3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.5, **3.3.10**, 3.4.1, 3.4.2, 4.2.1, 4.2.2, 5.2.1, 6.2.1, **6.2.3**	N/A	None
GEN2	Generator No. 2 Caterpillar G3520C (2,233 HP)	40 CFR 60 Subpart A 40 CFR 60 Subpart JJJJ 40 CFR 63 Subpart A 40 CFR 63 Subpart ZZZZ 391-3-1-.02(2)(b) 391-3-1-.02(2)(g)	3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.5, **3.3.10**, 3.4.1, 3.4.2, 4.2.1, 4.2.2, 5.2.1, 6.2.1, **6.2.3**	N/A	None
GEN3	Generator No. 3 Caterpillar G3520C (2,233 HP)	40 CFR 60 Subpart A 40 CFR 60 Subpart JJJJ 40 CFR 63 Subpart A 40 CFR 63 Subpart ZZZZ 391-3-1-.02(2)(b) 391-3-1-.02(2)(g)	3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.5, **3.3.10**, 3.4.1, 3.4.2, 4.2.1, 4.2.2, 5.2.1, 6.2.1, **6.2.3**	N/A	None
GEN4	**Generator No. 4** **Caterpillar G3520C (2,233 HP)**	**40 CFR 60 Subpart A** **40 CFR 60 Subpart JJJJ** **40 CFR 63 Subpart A** **40 CFR 63 Subpart ZZZZ** **391-3-1-.02(2)(b)** **391-3-1-.02(2)(g)**	**3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.3.5, 3.3.10, 3.4.1, 3.4.2, 4.2.1, 4.2.2, 4.2.3, 5.2.1, 6.2.1, 6.2**.2, 6.2.3	**N/A**	**None**

* Generally applicable requirements contained in this permit may also apply to emission units listed above. The lists of applicable requirements/standards and corresponding permit conditions are intended as a compliance tool and may not be definitive.

3.3 Equipment Federal Rule Standards

MODIFIED CONDITIONS

3.3.1 The Permittee shall comply with all the applicable provisions of the New Source Performance Standards (NSPS), 40 CFR 60, Subpart A – "General Provisions," and Subpart JJJJ – "Standards of Performance for Stationary Spark Ignition Internal Combustion Engines," for the operation of **Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4)**.
[40 CFR 60 Subpart A and Subpart JJJJ]

3.3.2 The Permittee shall comply with all the applicable provisions of the National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 63, Subpart A – "General Provisions," and Subpart ZZZZ – "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines," for the operation of **Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4)**.
[40 CFR 63 Subpart A and Subpart ZZZZ]

3.3.3 The Permittee shall not cause, let, suffer, permit or allow the rate of emissions from **Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4)**, subject to 40 CFR 60 Subpart JJJJ, any gases which contain emissions in total quantities exceeding the allowable rate as indicated below:
[40 CFR 60.4233(e) and Table 1 of 40 CFR 60 Subpart JJJJ]

a. NOx emissions in excess of 2.0 g/HP-hr or 150 ppmvd at 15% oxygen

b. CO emissions in excess of 5.0 g/HP-hr or 610 ppmvd at 15% oxygen

c. VOC emissions in excess of 1.0 g/HP-hr or 80 ppmvd at 15% oxygen

The owner and operator of stationary SI ICE may choose to comply with the emission standards in units of either g/HP-hr or ppmvd at 15 percent O_2.

3.3.4 The Permittee shall not discharge, or cause the discharge, into the atmosphere from **Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4)** any gases which contain carbon monoxide (CO) in excess of **13.0** pounds per hour each.
[PSD Avoidance]

3.3.5 For the **Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4)**, the Permittee shall keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions.
[40 CFR 60.4243(b)(2)(ii)]

3.3.9 The Permittee shall comply with the following requirements specified in 40 CFR 60.753 "Operational Standards for Collection and Control Systems" for the operation of the Landfill Gas Treatment System.
[40 CFR 60.753 (e) and (f)]

a. At all times that LFG is being supplied for use as a fuel in **Generators Nos. 1 through 4**, the landfill gas shall be treated in the Landfill Gas Treatment System. If any control system is inoperable, the gas mover system shall be shut down and all valves in the GCCS contributing to venting of the gas to the atmosphere shall be closed within one hour.

b. Operate the Landfill Gas Treatment System at all times when the collected gas is routed it.

NEW CONDITION

3.3.10 The Permittee shall limit the total operation of Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4) combined to 32,587.2 hours per twelve-consecutive calendar months.
[PSD Avoidance]

3.4 Equipment SIP Rule Standards

MODIFIED CONDITIONS

3.4.1 The Permittee shall not cause, let, suffer, permit or allow the emissions into the atmosphere from **Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4)**, the opacity of which is equal to or greater than forty (40) percent.
[391-3-1-.02(2)(b)]

3.4.2 The Permittee shall not combust, in **Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4)**, any fuel other than LFG, and such fuel shall not contain sulfur in amounts exceeding 2.5 percent by weight.
[391-3-1-.03(2)(c) and 391-3-1-.02(2)(g)]

PART 4.0 REQUIREMENTS FOR TESTING

4.2 Specific Testing Requirements

MODIFIED CONDITIONS

4.2.1 The Permittee shall conduct performance tests for nitrogen oxides, carbon monoxide and volatile organic compounds emissions from **Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4)** every 8,760 operating hours or 3 years, whichever comes first, to demonstrate compliance with the emission limits in Conditions 3.3.3 and 3.3.4. Performance tests shall be conducted on the engines at the maximum operating load point and per the requirements of Condition 4.2.2.
[40 CFR 60.4243(b)(2)]

4.2.2 The Permittee shall conduct performance testing, as specified in Condition 4.2.1 **and 4.2.3**, following the procedures in 40 CFR 60.4244, which include the following:
[40 CFR 60.4244]

a. Each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and under the specific conditions that are specified by Table 2 of 40 CFR 60 Subpart JJJJ.

b. The Permittee may not conduct performance tests during periods of startup, shutdown, or malfunction. If **Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4)** is non-operational, the Permittee does not need to start up the engine solely to conduct a performance test; however, the performance test must be conducted immediately upon startup of the engine.

c. The Permittee must conduct three separate test runs for each performance test. Each test run must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least 1 hour.

d. To determine compliance with the NOx mass per unit output emission limitation, the Permittee shall convert the concentration of NOx in the engine exhaust using the following equation:

$$ER = \frac{C_d \times 1.912 \times 10^{-3} \times Q \times T}{HP - hr}$$

Where:
ER = Emission rate of NOx in g/HP-hr.
C_d = Measured NOx concentration in parts per million by volume (ppmv).
1.912×10^{-3} = Conversion constant for ppm NOx to grams per standard cubic meter at 20 degrees Celsius.
Q = Stack gas volumetric flow rate, in standard cubic meter per hour, dry basis.
T = Time of test run, in hours.
HP-hr = Brake work of the engine, in horsepower-hours (HP-hr).

e. To determine compliance with the CO mass per unit output emission limitation, the Permittee shall convert the concentration of CO in the engine exhaust using the following equation:

$$ER = \frac{C_d \times 1.164 \times 10^{-3} \times Q \times T}{HP - hr}$$

Where:
ER = Emission rate of CO in g/HP-hr.
C_d = Measured CO concentration in ppmv.
1.164×10^{-3} = Conversion constant for ppm CO to grams per standard cubic meter at 20 degrees Celsius.
Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.
T = Time of test run, in hours.
HP-hr = Brake work of the engine, in HP-hr.

f. For purposes of this subpart, when calculating emissions of VOC, emissions of formaldehyde should not be included. To determine compliance with the VOC mass per unit output emission limitation, the Permittee shall convert the concentration of VOC in the engine exhaust using the following equation:

$$ER = \frac{C_d \times 1.833 \times 10^{-3} \times Q \times T}{HP - hr}$$

Where:
ER = Emission rate of VOC in g/HP-hr.
C_d = VOC concentration measured as propane in ppmv.
1.833×10^{-3} = Conversion constant for ppm VOC measured as propane, to grams per standard cubic meter at 20 degrees Celsius.
Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.
T = Time of test run, in hours.
HP-hr = Brake work of the engine, in HP-hr.

g. If the Permittee chooses to measure VOC emissions using either Method 18 or Method 320, then the measured VOC emissions may be corrected to account for the potential differences in measured values between these methods and Method 25A. The results from Method 18 and Method 320 may be corrected for response factor differences using the following equations for RF_i and C_{icorr}. The corrected VOC concentration can then be corrected to a propane basis using the following equation for C_{Peq}.

$$RF_i = \frac{C_{Mi}}{C_{Ai}}$$

Where:
RF_i = Response factor of compound i when measured with EPA Method 25A.
C_{Mi} = Measured concentration of compound i in ppmv as carbon.
C_{Ai} = True concentration of compound i in ppmv as carbon.

$$C_{icorr} = \frac{RF_i}{C_{imeas}}$$

Where:
C_{icorr} = Concentration of compound i corrected to the value that would have been measured by EPA Method 25A, ppmv as carbon.
C_{imeas} = Concentration of compound i measured by EPA Method 320, ppmv as carbon.

$$C_{Peq} = 0.6098 \times C_{icorr}$$

Where:
C_{Peq} = Concentration of compound i in mg of propane equivalent per DSCM.

NEW CONDITION

4.2.3 The Permittee shall conduct performance tests for nitrogen oxides, carbon monoxide and volatile organic compounds emissions from Generators No. 4 (Source Code: GEN4) to demonstrate compliance with the emission limits in Conditions 3.3.3 and 3.3.4. Performance tests shall be conducted on the engines at the maximum operating load point and per the requirements of Condition 4.2.2. The performance tests shall be conducted within 60 days after achieving the maximum production rate at which Generators No. 4 (Source Code: GEN4) will be operated, but not later than 180 days after initial startup of the engine.
[40 CFR 60.4243(b)(2)]

PART 5.0 REQUIREMENTS FOR MONITORING (Related to Data Collection)

5.2 Specific Monitoring Requirements

MODIFIED CONDITION

5.2.1 The Permittee shall install, calibrate, maintain, and operate monitoring devices for the measurement of the indicated parameters on the following equipment. Data shall be recorded at the frequency specified below. Where such performance specification(s) exist, each system shall meet the applicable performance specification(s) of the Division's monitoring requirements.
[391-3-1-.02(6)(b)1 and 40 CFR 70.6(a)(3)(i)]

a. A non-resettable hour meter on **Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4)**. Data shall be recorded monthly.

b. A device to measure the gas flow rate to Landfill Gas Treatment System at least once every 15 minutes.

PART 6.0 OTHER RECORD KEEPING AND REPORTING REQUIREMENTS

6.1 General Record Keeping and Reporting Requirements

MODIFIED CONDITOIN

6.1.7 For the purpose of reporting excess emissions, exceedances or excursions in the report required in Condition 6.1.4, the following excess emissions, exceedances, and excursions shall be reported:
[391-3-1-.02(6)(b)1, 40 CFR 70.6(a)(3)(iii), and 40 CFR 63.6650(g)]

a. Excess emissions: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping which is specifically defined, or stated to be, excess emissions by an applicable requirement)

None required to be reported in accordance with Condition 6.1.4.

b. Exceedances: (means for the purpose of this Condition and Condition 6.1.4, any condition that is detected by monitoring or record keeping that provides data in terms of an emission limitation or standard and that indicates that emissions (or opacity) do not meet the applicable emission limitation or standard consistent with the averaging period specified for averaging the results of the monitoring)

i. Any twelve-consecutive month total hours of operation for Generators Nos. 1 through 4 (Source Codes: GEN1 through 4) combined that exceeds the limit in Condition 3.3.10.

c. Excursions: (means for the purpose of this Condition and Condition 6.1.4, any departure from an indicator range or value established for monitoring consistent with any averaging period specified for averaging the results of the monitoring)

i. Any time that Landfill Gas Treatment System is not operating when landfill gas is routed to it.

d. In addition to the excess emissions, exceedances and excursions specified above, the following should also be included with the report required in Condition 6.1.4:

i. The twelve-consecutive month total hours of operation for Generators Nos. 1 through 4 (Source Codes: GEN1 through 4) combined for each month in the reporting period.

6.2 Specific Record Keeping and Reporting Requirements

MODIFIED CONDITION

6.2.1. For **Generators Nos. 1 through 4 (Source Codes: GEN1 through GEN4)**, the Permittee shall keep the following records:
[40 CFR 60.4245(a) and 40 CFR 63.6655(c)]

a. All notifications submitted to comply with 40 CFR 60 Subpart JJJJ and all documentation supporting any notification.

b. Maintenance conducted on the engines.

c. Documentation that each engine meets the emission standards.

d. Records of the daily fuel usage monitor.

NEW CONDITIONS

6.2.2 For Generators No. 4 (Source Codes: GEN4), the Permittee shall submit an initial notification as required in 40 CFR 60.7(a)(1). The notification must include the following information:
[40 CFR 60.4245(c)]

a. Name and address of the owner or operator.

b. The address of the affected source.

c. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement.

d. Emission control equipment.

e. Fuel used.

6.2.3 The Permittee shall use the monthly operating hours data recorded in accordance with Condition 5.2.1 to calculate the twelve-consecutive month total hours of operation for Generators Nos. 1 through 4 (Source Codes: GEN1 through 4) combined for each calendar month. A twelve-consecutive month total shall be the total for a month in the reporting period plus the totals for the previous eleven consecutive months.
[391-3-1-.02(6)(b)1(i) and 40 CFR 70.6(a)(3)(ii)(B)]