Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

PERMITTEE

City of Jacksonville
Public Works Department
117 West Duval Street, St. James Building, 4th Floor
Jacksonville, FL 32202

Authorized Representative:
Ms. Kerri Stewart, Chief Administrative Officer

Air Permit No. 0310358-012-AC/ PSD-FL-374C
Permit Expires: October 1, 2016
Trail Ridge Energy, LLC
Facility ID No. 0310358
Landfill Gas-to-Energy Project

PROJECT

This is the final air construction permit, which authorizes the installation and operation of four new Caterpillar Model No. G3520C or equivalent engine generator sets and modifies the CO emissions standard as Best Available Control Technology (BACT) for the proposed and existing engine generator sets. In addition, the applicant requested a concurrent revision of the Title V air operation permit. The proposed work will be conducted at the existing Trail Ridge Energy Landfill, which is a landfill categorized under Standard Industrial Classification No. 4953. The existing facility is located in Duval County at 5110 US Highway 301 South, Baldwin, Florida. The UTM coordinates are Zone 17, 399.765 km East, and 3344.919 km North.

This final permit is organized into the following sections: Section 1 (General Information); Section 2 (Administrative Requirements); Section 3 (Emissions Unit Specific Conditions); Section 4 (Appendices). Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of Section 4 of this permit. As noted in the Final Determination provided with this final permit, only minor changes and clarifications were made to the draft permit.

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of: Chapter 403 of the Florida Statutes (F.S.) and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to conduct the proposed work in accordance with the conditions of this permit. This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C. and is not subject to the preconstruction review requirements for major stationary sources in Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

Upon issuance of this final permit, any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within 30 days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida
For the Division of Air Resource Management

_____ _____

Jeffery F. Koerner, P.E., Program Administrator (Date)
Office of Permitting and Compliance
Division of Air Resource Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Final Air Permit package (including the Final Determination and Final Permit with Appendices) was sent by electronic mail, or a link to these documents made available electronically on a publicly accessible server, with received receipt requested before the close of business on _____ to the persons listed below.

Ms. Kerri Stewart, City of Jacksonville(kerris@coj.net)
Mr. Scott Salisbury, Trail Ridge Energy, LLC (scott.salisbury@landfillenergy.com)
Mr. Robert Harvey, P.E., Derenzo and Associates, Inc. (rharvey@derenzo.com)
Mr. Chris Kirts, Northeast District (christopher.kirts@dep.state.fl.us)
Mr. Richard Robinson, Duval County Environmental Resources Management (robinson@coj.net)
Ms. Kathleen Forney, EPA Region 4 (forney.kathleen@epa.gov)
Ms. Heather Abrams, EPA Region 4 (abrams.heather@epa.gov)
Ms. Ana Oquendo, US EPA Region 4 (oquendo.ana@epa.gov)
Ms. Barbara Friday, DEP OPC (barbara.friday@dep.state.fl.us) (for posting with U.S. EPA, Region 4)
Ms. Lynn Scearce, DEP OPC Reading File (lynn.scearce@dep.state.fl.us)

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency clerk, receipt of which is hereby acknowledged.

_____ _____
(Clerk) (Date)

FACILITY DESCRIPTION

The Trail Ridge Landfill operates a 176 acre, Class I municipal solid waste (MSW) landfill in Baldwin, Duval County which is allocated for Class I MSW. The landfill gas (LFG) is produced from both active and capped cells. The gas is collected by an active, landfill gas collection system and routed to a treatment system that treats the landfill gas for subsequent use as fuel to power the six reciprocating internal combustion engines (RICE)-generator sets at the Trail Ridge Energy, LLC electricity generation plant. Trail Ridge Energy, LLC electricity generation operations are under contract with the landfill and the operations will be fueled with the landfill gas provided by the landfill. Any excess landfill gas that exceeds the volume that the Trail Ridge Energy LLC Plant is able to accept will be diverted to open flares for control. The existing facility consists of the following emissions units.

Facility ID No. 0310358

ID No.	Emission Unit Description
001	Municipal Solid Waste Landfill
002	Fugitive Dust Emissions
004-009	Six Caterpillar Model G3520C landfill gas fueled internal combustion engines and electricity generators
010	5,000 scfm open, non-assisted flare
011	1,600 scfm open, non-assisted flare

PROPOSED PROJECT

This draft permit approves the installation of four new Caterpillar Model No. G3520C sets or equivalent engine generator and sets the CO emissions standard at 3.5 grams per brake horsepower per hour (g/bhp-hour) as Best Available Control Technology (BACT). Since this is higher than the BACT determination for CO emissions for the originally installed engines, the draft permit revises the CO BACT standard from 2.75 g/bhp-hour to 3.5 g/bhp-hour for the six existing, lean-burn Caterpillar Model No. G3520C engines. The addition to the existing electrical generation plant will consist of:

- LFG treatment equipment for dewatering, filtration and compression.
- Four new reciprocating internal combustion engines, each coupled to a 1,600 kilowatt (kW) electrical generator. Under base load operating conditions, the plant will generate a total of 16 megawatts (MW, nominal) of electricity and will be interconnected to the JEA distribution network through a nearby power line.
- Unregulated ancillary equipment that supports the electric generation plant consists of:
  - A stand-alone fan-cooled radiator for each IC engine.
  - Drums for the engine radiator coolant.
  - One used lube oil tank (approximately 1,000 gallons) and moisture conditioning equipment.
  - One new lube oil tank (approximately 2,000 gallons) and moisture conditioning equipment.

This project will add following emissions units.

Facility ID No. 0310358

ID No.	Emission Unit Description
012-015	Four Caterpillar Model G3520C or equivalent landfill gas fueled internal combustion engines and electricity generators.

FACILITY REGULATORY CLASSIFICATION

- The facility is not a major source of hazardous air pollutants (HAP).
- The facility does not operate units subject to the acid rain provisions of the Clean Air Act (CAA).
- The facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The facility is a major stationary source in accordance with Rule 62-212.400(PSD), F.A.C.
- The facility operates or will operate units subject to the following applicable New Source Performance Standards (NSPS) in Title 40, Part 60 of the Code of Federal Regulations (40 CFR 60): Subpart A (General Provisions), Subpart WWW (MSW Landfills). In addition the four proposed engine/generator sets, Emission Unit ID Nos. 012-015, are subject to Subpart JJJJ (Spark Ignition Reciprocating Internal Combustion Engines). The existing engine/generator sets, Emission Unit ID Nos. 004-009, are not subject to Subpart JJJJ.
- The facility operates or will operate units subject to the following applicable National Emissions Standards for Hazardous Air Pollutants (NESHAP) in Title 40, Part 63 of the Code of Federal Regulations (40 CFR 63): Subpart AAAA (MSW Landfills) and initial notification, reporting and recordkeeping requirement of the subpart applicable NESHAP provisions in 40 CFR 63 for Subpart A (General Provisions). In addition the four proposed engine/generator sets, Emission Unit ID Nos. 012-015, are subject to Subpart ZZZZ (Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines). The existing engine/generator sets, Emission Unit ID Nos. 004-009, are not subject to Subpart ZZZZ.

SECTION 2. ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: The permitting authority for this project is the Office of Permitting and Compliance (OPC), Division of Air Resource Management, Florida Department of Environmental Protection (Department). The OPC's mailing address is 2600 Blair Stone Road (MS #5505), Tallahassee, Florida 32399-2400. All documents related to applications for permits to operate an emissions unit shall be submitted to the Northeast District Office at: 7825 Baymeadows Way, Suite B-200, Jacksonville, FL 32256-7590.

2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Northeast District Office at: 7825 Baymeadows Way, Suite B-200, Jacksonville, FL 32256-7590.

3. Appendices: The following Appendices are attached as a part of this permit: Appendix A (Citation Formats and Glossary of Common Terms); Appendix B (General Conditions); Appendix C (Common Conditions); Appendix D (Common Testing Requirements); Appendix E (Final BACT Determinations); Appendix ICE (NSPS and NESHAP Provisions) and Appendix ALT-078.

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S.; and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296 and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.

5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

6. Modifications: The permittee shall notify the Compliance Authority upon commencement of construction. No new emissions unit shall be constructed and no existing emissions unit shall be modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

7. Source Obligation:

   (a) Authorization to construct shall expire if construction is not commenced within 18 months after receipt of the permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. This provision does not apply to the time period between construction of the approved phases of a phased construction project except that each phase must commence construction within 18 months of the commencement date established by the Department in the permit.

   (b) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

   (c) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by exceeding its projected actual emissions, then the requirements of subsections 62-12.400(4)

through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

[Rule 62-212.400(12), F.A.C.]

8. Actual Emissions Reporting: This permit is based on an analysis that compared baseline actual emissions with projected actual emissions and avoided the requirements of subsection 62-212.400(4) through (12), F.A.C. for several pollutants. Therefore, pursuant to Rule 62-212.300(1)(e), F.A.C., the permittee is subject to the following monitoring, reporting and recordkeeping provisions.

   a. The permittee shall monitor the emissions of any PSD pollutant that the Department identifies could increase as a result of the construction or modification and that is emitted by any emissions unit that could be affected; and, using the most reliable information available, calculate and maintain a record of the annual emissions, in tons per year on a calendar year basis, for a period of 10 years following resumption of regular operations after the change. Emissions shall be computed in accordance with the provisions in Rule 62-210.370, F.A.C., which are provided in Appendix C of this permit.

   b. The permittee shall report to the Department within 60 days after the end of each calendar year during the 10-year period setting out the unit's annual emissions during the calendar year that preceded submission of the report. The report shall contain the following:

      1) The name, address and telephone number of the owner or operator of the major stationary source;

      2) The annual emissions calculations pursuant to the provisions of 62-210.370, F.A.C., which are provided in Appendix C of this permit;

      3) If the emissions differ from the preconstruction projection, an explanation as to why there is a difference; and

      4) Any other information that the owner or operator wishes to include in the report.

   c. The information required to be documented and maintained pursuant to subparagraphs 62-212.300(1)(e)1 and 2, F.A.C., shall be submitted to the Department, which shall make it available for review to the general public.

For this project, the permit requires the annual reporting of actual sulfur dioxide (SO_2) and hydrogen chloride (HCl) emissions from the flares and landfill gas engines. *{Permitting Note: Baseline SO_2 emissions were reported as 25 tons/year. Baseline HCl emissions from the flares were reported as 2.5 tons/year.}*
[Application 0310358-012-AC; and Rules 62-212.300(1)(e) and 62-210.370, F.A.C.]

9. Title V Permit: This permit authorizes new construction of the proposed emissions units as well as initial operation to determine compliance with conditions of this permit. A Title V operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a Title V operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after completing the required work and commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the appropriate Permitting Authority with copies to each Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

A. EU 004-009

This section of the permit addresses the modification of the following emissions units.

ID No.	Emission Unit Description
004-009	Six Caterpillar Model G3520C landfill gas fueled internal combustion engines and electricity generators. Each engine has a power generation rating of 2,233 brake horsepower at 100 percent load. The generator has a power output rating of 1,600 kilowatt. The engines will be fueled exclusively with landfill gas generated by and received from the Trail Ridge landfill facility. The landfill gas will go through a gas treatment system prior to combustion in the engines.

EQUIPMENT

1. Landfill Gas Engine/Generator Sets: The permittee is authorized to install and operate six (Caterpillar Model G3520C) spark-ignited reciprocating internal combustion engines. Each engine is a 20-cylinder engine with a total displacement of approximately 86.3 liters. Each engine has a maximum rating of 2,233 bhp and is coupled to a 1,600 kW generator (nominal rating) for the generation of up to a total of 9.6 MW of electricity. The maximum rating when coupled to the electrical generator is 2,233 bhp. Each engine will fire LFG. The LFG will pass through a gas treatment system prior to combustion in the engines.

   a. Each engine shall be equipped with an air-to-fuel ratio controller and ignition timing to maintain efficient fuel combustion.

   b. Each engine shall be equipped with an automatic fail-safe block valve which must be designed to stop the flow of landfill gas in the event of an engine failure.

   c. Each engine shall be equipped with a non-resettable elapsed time meter to indicate the elapsed engine operating time in cumulative hours.

   d. A gas flow meter shall be installed to monitor the total flow rate to all of the landfill gas engines.

   {Permitting Note: The heat input rate is based on 100% load (2,233 bhp), a nominal landfill gas heating value of 500 British thermal units (Btu) per scf and an approximate landfill gas firing rate of 580 scfm per engine.} [Application No. 0310358-004-AC; and Rules 62-4.070(3), 62-210.200(PTE) and 62-212.400(PSD), F.A.C.]

2. LFG Treatment System: The permittee shall design, install, operate and maintain a LFG Treatment System including equipment for: gas compression (blowers/compressors), de-watering (knock-out and chilling system) and particulate removal (filtration). Specifically, the permittee shall design, install, maintain and operate 1 micron primary and polishing filters to remove particulate matter from the LFG prior to combustion in the engines. The LFG treatment system shall not be equipped with atmospheric vents. [Application No. 0310358-004-AC; and Rule 62-212.400, F.A.C.]

PERFORMANCE RESTRICTIONS

3. Permitted Capacity: Each landfill gas engine has a maximum power rating of 2,233 bhp at 100% load (approximately 17.6 MMBtu/hour). The electrical generator set has a nominal power rating of 1,600 kilowatts. [Rule 62-210.200(PTE), F.A.C.]

4. Authorized Fuel: Each engine shall fire only landfill gas. [Application No. 0310358-004-AC and Rule 62-210.200(PTE), F.A.C.]

5. Restricted Operation: The hours of operation are not limited (8760 hours per year). [Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

6. Operating Requirements: The permittee shall set the air-to-fuel ratio for each engine based on the most recent emissions tests or each engine shall be operated within 0.5 percent of the oxygen content in the exhaust gas at the air-to-fuel ratio operated at during the most recent performance test demonstrating compliance with the standards specified in this permit and other operating conditions. [Rule 62-212.400(BACT), F.A.C. ; Appendix F of Construction Permit Application; Construction Permit No. 0310358-004-AC/PSD-FL-374]

EMISSIONS STANDARDS

7. Nitrogen Oxides (NOx): The emission rate of NOx from each engine/generator set exhaust shall not exceed 0.6 gram per brake horsepower hour (g/bhp-hr) and a maximum of 3.0 pounds per hour (lb/hr). [Rule 62-212.400(12), F.A.C.]

8. Carbon Monoxide (CO): The emission rate of CO from each engine/generator set exhaust shall not exceed 3.5 g/bhp-hr and a maximum of 17.2 lb/hr. [Rule 62-212.400(12), F.A.C.]

9. Particulate Matter/Particulate Matter less than 10 microns (PM/PM_{10}): Emissions of PM/PM_{10} shall be minimized by the following work practice standards: installing, maintaining and operating the LFG Treatment System that meets the filtration specification; and, as determined by EPA Method 9, visible emissions from each engine exhaust shall not exceed 10% opacity. *{Permitting Note: Based on these work practice standards, the expected maximum PM/PM_{10} emissions from each engine is 0.24 g/bhp-hr and a maximum of 1.2 lb/hr.}* [Rule 62-212.400(BACT), F.A.C.]

10. Volatile Organic Compounds (VOC): The emission rate of total VOC from each engine/generator set exhaust shall not exceed 0.28 g/bhp-hr and a maximum of 1.4 lb/hr. *{Permitting Note: Project avoids PSD review for VOC based on emission limits.}* [Rules 62-204.800 and 62-212.400(12), F.A.C.]

11. Sulfur Dioxide (SO_2): Sulfur dioxide emissions from all six engines shall not exceed 25.0 tons during any rolling 12 months. Emissions shall be calculated based on the representative sulfur content of each fuel and the actual monthly fuel consumption rate of each fuel based on the following:

    a. LFG: The representative sulfur content for a given month shall be the sulfur content determined from sampling and analysis within the same semiannual period.

    b. Fuel Consumption: The monthly fuel consumption shall be determined from the fuel flow monitors.

    Compliance with the SO_2 emissions cap shall be determined by summing the calculated monthly SO_2 emissions from each fuel based on stoichiometry for a rolling 12-month period. *{Permitting Note: The project avoids PSD review based on this emissions cap.}* [Rule 62-212.400(12)(Source Obligation), F.A.C.]

12. Hydrogen Chloride (HCl): Hydrogen chloride emissions from the facility shall not exceed 9.0 tons during any rolling 12 months. Emissions shall be calculated based on the representative chlorine content of LFG and the actual monthly fuel consumption rate of the engines and the amount flared based on the following:

    a. LFG: The representative chlorine content for a given month shall be the chlorine content determined from sampling and analysis within the same semiannual period.

    b. Fuel Consumption: The monthly fuel consumption shall be determined from the fuel flow monitors on the engines as well as the flares.

    Compliance with the HCl emissions cap shall be determined by summing the calculated monthly HCl emissions from LFG based on stoichiometry for a rolling 12-month period. *{Permitting Note: This emissions cap ensures that the facility remains an area source of HAP emissions with regard to NESHAP*

Subpart ZZZZ in 40 CFR 63 (less than 10 tons per year of any single HAP and less than 25 tons per year for the combination of all HAPs)}. [Applicant Request and Rule 62-4.070(3), F.A.C.]

13. Visible emissions: Visible emissions from each engine/generator set exhaust shall not exceed 10% opacity. [Rule 62-212.400, F.A.C.]

EXCESS EMISSIONS

14. Excess Emissions Allowed: Excess CO and NOx emissions (as specified in this subsection) resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing best operational practices to minimize emissions are adhered to and:

    a. To the extent practicable, the operator shall strive to complete engines startups within 30 minutes; and

    b. The duration of excess emissions due to malfunctions shall be minimized but in no case exceed two hours in any 24-hour period.

    [Rule 62-210.700(1), F.A.C.]

TESTING REQUIREMENTS

15. Performance Tests: Initial, annual and renewal compliance tests shall be conducted on only one of the six engines. A different engine shall be tested each year such that all engines are tested during the six year cycle.

16. Test Requirements: During each required compliance stack test, the permittee shall operate a tested landfill gas engine at permitted capacity (90% to 100% of 2,233 bhp). The permittee shall notify the Compliance Authority in writing at least 15 days prior to any scheduled stack tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit. *{Permitting Note: Although the NSPS provides for a 30-day test notification, a 15-day notice is sufficient in Florida.}* [Rule 62-297.310(7)(a)9, F.A.C.]

17. Test Methods: Tests required by this permit shall be performed in accordance with the following reference methods.

Method	Description of Method and Comments
1 - 4	Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content
7 or 7E	Determination of Nitrogen Oxide Emissions from Stationary Sources
9	Visual Determination of the Opacity of Emissions from Stationary Sources
10	Determination of Carbon Monoxide Emissions from Stationary Sources {Note: The method shall be based on a continuous sampling train.}
19	Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates (Optional F-factor method may be used to determine flow rate and gas analysis to calculate mass emissions in lieu of Methods 1-4.)
18	Measurement of Gaseous organic Compound Emissions by Gas Chromatography *{Note: the emission standards are based on VOC measured as methane.}*
25A	Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer *{Note: the emission standards are based on VOC measured as methane.}*
ALT-078	Clarification of Approval of an Alternative to Method 18 for 40 CFR Part 60, Subpart JJJJ

The above methods are described in Appendix A of 40 CFR 60 and are adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. ALT-078 method is included in the Appendices. [Rules 62-204.800, 62-212.400(BACT) and Appendix A of 40 CFR 60]

18. LFG Composition Analysis: The following methods shall be used to satisfy the sampling/analysis of LFG:

    a. Sulfur Content: ASTM Method D5504-01 or equivalent.

    b. Chlorine Content: Modified EPA Method TO-15 or equivalent.

    c. The LFG shall be collected and transported in an appropriate canister (e.g. SUMMA®, Bottle-Vac Sampler or equivalent).

    [Rule 62-4.070(3), F.A.C.]

MONITORING REQUIREMENTS

19. Landfill Gas Sampling/Analysis: At least semiannually, the permittee shall obtain the following representative samples of landfill gas: a sample taken during each required compliance stack test; and a sample taken during the next semiannual period. A representative sample shall be taken in each calendar semiannual period (January – June and July – December) approximately six months apart. Each gas sample shall be collected under normal operating conditions (i.e., with valves open for all operating cells) by appropriate canister (e.g. SUMMA®, Bottle-Vac Sampler or equivalent). Each sample shall have an ultimate analysis conducted for at least sulfur and chlorine. Results shall also be reported as SO_2 and HCl emission factors in terms of lb/million standard cubic feet (lb/MMscf) of landfill gas. Based on the sampling results and Rule 62-297.310(7)(b)(Special Compliance Tests), F.A.C., the Compliance Authority may request additional gas sampling and analyses. [Rules 62-210.200 and 62-212.400, F.A.C.]

20. Monthly Records: Within ten calendar days following each month, the permittee shall observe and record the following information in a written log or electronic format accessible to a compliance inspector: number of hours of operation of each engine; total monthly landfill gas flow rate to all engines combined; and HCl and SO_2 emissions for the month and previous 12 months, rolling total. Emissions of HCl and SO_2 shall be calculated from the monthly fuel consumption as well as the analytical results for the chlorine and sulfur contents of the landfill gas representative of the given month of operation based on the semiannual sampling for that period. [Rule 62-210.200 (232), F.A.C.]

RECORDS AND REPORTS

21. Test Reports: The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA test, shall provide the applicable information identified in Rule 62-297.310(8)(c). [Rule 62-297.310(8), F.A.C.]

B. EU 012-015

This section of the permit addresses the following emissions units.

ID No.	Emission Unit Description
012-015	Four Caterpillar Model G3520C or equivalent landfill gas fueled internal combustion engines and electricity generators. Each engine has a power generation rating of 2,233 brake horsepower at 100 percent load. The generator has a power output rating of 1,600 kilowatt. The engines will be fueled exclusively with landfill gas generated by and received from the Trail Ridge Landfill facility. The landfill gas will go through a gas treatment system prior to combustion in the engines

{Permitting Note: Emission Unit ID Nos. 012 and 013 are planned to be installed once the permit is issued and Emission Unit ID Nos. 014 and 015 will be installed at a later date.}

EQUIPMENT

1. Landfill Gas Engine/Generator Sets: The permittee is authorized to install and operate four (Caterpillar Model G3520C or equivalent) spark-ignited reciprocating internal combustion engines. Each engine is a 20-cylinder engine with a total displacement of approximately 86.3 liters. Each engine has a maximum rating of 2,233 bhp and is coupled to a 1,600 kW generator (nominal rating) for the generation of up to a total of 6.4 MW of electricity. The maximum rating when coupled to the electrical generator is 2,233 bhp. Each engine will fire LFG. The LFG will pass through a gas treatment system prior to combustion in the engines.

   a. Each engine shall be equipped with an air-to-fuel ratio controller and ignition timing to maintain efficient fuel combustion.

   b. Each engine shall be equipped with an automatic fail-safe block valve which must be designed to stop the flow of landfill gas in the event of an engine failure.

   c. Each engine shall be equipped with a non-resettable elapsed time meter to indicate the elapsed engine operating time in cumulative hours.

   d. A gas flow meter shall be installed to monitor the total flow rate to all of the landfill gas engines.

   {Permitting Note: The heat input rate is based on 100% load (2,233 bhp), a nominal landfill gas heating value of 500 British thermal units (Btu) per scf and an approximate landfill gas firing rate of 580 scfm per engine.} [Application No. 0310358-012-AC; and Rules 62-4.070(3), 62-210.200(PTE) and 62-212.400(PSD), F.A.C.]

2. LFG Treatment System: The permittee shall design, install, operate and maintain a LFG Treatment System including equipment for: gas compression (blowers/compressors), de-watering (knock-out and chilling system) and particulate removal (filtration). Specifically, the permittee shall design, install, maintain and operate 1 micron primary and polishing filters to remove particulate matter from the LFG prior to combustion in the engines. The LFG treatment system shall not be equipped with atmospheric vents. [Application No. 0310358-012-AC; and Rule 62-212.400, F.A.C.]

3. Construction Milestones: The permittee shall submit to the Office of Permitting and Compliance a construction schedule and any changes to the schedule for the first two engines (Emission Unit ID Nos. 012 and 013) within 90 days of the permit issuance. For the remaining two engines (Emission Unit ID Nos. 014 and 015), the permittee shall submit the construction schedule within one year of issuance of the permit. [Rule 62-212.400(12), F.A.C.]

PERFORMANCE RESTRICTIONS

4. Permitted Capacity: Each landfill gas engine has a maximum power rating of 2,233 bhp at 100% load (approximately 17.6 MMBtu/hour). The electrical generator set has a nominal power rating of 1,600 kilowatts. [Rule 62-210.200(PTE), F.A.C.]

5. Authorized Fuel: Each engine shall fire only landfill gas. [Application No. 0310358-012-AC and Rule 62-210.200(PTE), F.A.C.]

6. Restricted Operation: The hours of operation are not limited (8760 hours per year). [Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

7. Operating Requirements: The permittee shall set the air-to-fuel ratio for each engine based on the most recent emissions tests or each engine shall be operated within 0.5 percent of the oxygen content in the exhaust gas at the air-to-fuel ratio operated at during the most recent performance test demonstrating compliance with the standards specified in this permit and other operating conditions identified in NSPS 40 CFR 60, Subpart JJJJ. [Rule 62-212.400(BACT), F.A.C., Construction Permit No. 0310358-004-AC/PSD-FL-374 and NSPS Subpart JJJJ in 40 CFR 60]

8. Applicable NSPS Provisions: The landfill gas engines are subject to, and shall comply with, the applicable provisions in NSPS Subpart A (General Provisions) and NSPS Subpart JJJJ (Stationary Spark Ignition Internal Combustion Engines) of 40 CFR 60, which are identified in Appendix ICE of this permit. [NSPS Subparts A and JJJJ in 40 CFR 60 and Rule 62-204.800, F.A.C.]

9. Applicable NESHAP Provisions: The landfill gas engines are subject to, and shall comply with, initial notification, reporting and recordkeeping requirement of the subpart applicable NESHAP provisions in 40 CFR 63 for Subpart A (General Provisions) and Subpart ZZZZ (Reciprocating Internal Combustion Engines) of 40 CFR 63, which are identified in Appendix ICE of this permit. Pursuant to 40 CFR 63.6590, the landfill gas engines complies with NESHAP Subpart ZZZZ by complying with NSPS Subpart JJJJ. [NESHAP Subparts A and ZZZZ in 40 CFR 63 and Rule 62-204.800, F.A.C.]

EMISSIONS STANDARDS

10. Nitrogen Oxides (NOx): The emission rate of NOx from each engine/generator set exhaust shall not exceed 0.6 gram per brake horsepower hour (g/bhp-hr) and a maximum of 3.0 pounds per hour (lb/hr). [Rule 62-212.400(12), F.A.C.]

11. Carbon Monoxide (CO): The emission rate of CO from each engine/generator set exhaust shall not exceed 3.5 g/bhp-hr and a maximum of 17.2 lb/hr. [Rule 62-212.400(12), F.A.C.]

12. Particulate Matter/Particulate Matter less than 10 microns (PM/PM_{10}): Emissions of PM/PM_{10} shall be minimized by the following work practice standards: installing, maintaining and operating the LFG Treatment System that meets the filtration specification; and, as determined by EPA Method 9, visible emissions from each engine exhaust shall not exceed 10% opacity. {*Permitting Note: Based on these work practice standards, the expected maximum PM/PM_{10} emissions from each engine is 0.24 g/bhp-hr and a maximum of 1.2 lb/hr.*} [Rule 62-212.400(BACT), F.A.C.]

13. Volatile Organic Compounds (VOC): The emission rate of total VOC from each engine/generator set exhaust shall not exceed 0.28 g/bhp-hr and a maximum of 1.4 lb/hr. *{Permitting Note: 1.0 g/bhp-hour limit is the NSPS Subpart JJJJ standard, however the "g/bhp-hour" and "lb/hour" limits allow the project to avoid PSD preconstruction review for VOC emissions.}* [NESHAP Subparts A and JJJJ in 40 CFR 63 and Rules 62-204.800 and 62-212.400(12), F.A.C.]

14. Sulfur Dioxide (SO_2): Sulfur dioxide emissions from all four engines shall not exceed 16.6 tons during any rolling 12 months. Emissions shall be calculated based on the representative sulfur content of each fuel and the actual monthly fuel consumption rate of each fuel based on the following:

    a. LFG: The representative sulfur content for a given month shall be the sulfur content determined from sampling and analysis within the same semiannual period.

    b. Fuel Consumption: The monthly fuel consumption shall be determined from the fuel flow monitors.

    Compliance with the SO_2 emissions cap shall be determined by summing the calculated monthly SO_2 emissions from each fuel based on stoichiometry for a rolling 12-month period. *{Permitting Note: The project avoids PSD review based on this emissions cap.}* [Rule 62-212.400(12)(Source Obligation), F.A.C.]

15. Hydrogen Chloride (HCl): Hydrogen chloride emissions from the facility shall not exceed 9.0 tons during any rolling 12 months. Emissions shall be calculated based on the representative chlorine content of LFG and the actual monthly fuel consumption rate of the engines and the amount flared based on the following:

    a. LFG: The representative chlorine content for a given month shall be the chlorine content determined from sampling and analysis within the same semiannual period.

    b. Fuel Consumption: The monthly fuel consumption shall be determined from the fuel flow monitors on the engines as well as the flares.

    Compliance with the HCl emissions cap shall be determined by summing the calculated monthly HCl emissions from LFG based on stoichiometry for a rolling 12-month period. *{Permitting Note: This emissions cap ensures that the facility remains an area source of HAP emissions with regard to NESHAP Subpart ZZZZ in 40 CFR 63 (less than 10 tons per year of any single HAP and less than 25 tons per year for the combination of all HAPs)}.* [Applicant Request and Rule 62-4.070(3), F.A.C.]

16. Visible emissions: Visible emissions from each engine/generator set exhaust shall not exceed 10% opacity. [Rule 62-212.400, F.A.C.]

EXCESS EMISSIONS

17. Excess Emissions Allowed: Excess CO and NOx emissions (as specified in this subsection) resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing best operational practices to minimize emissions are adhered to and:

    a. To the extent practicable, the operator shall strive to complete engines startups within 30 minutes; and

    b. The duration of excess emissions due to malfunctions shall be minimized but in no case exceed two hours in any 24-hour period.

    [Rule 62-210.700(1), F.A.C.]

TESTING REQUIREMENTS

18. Initial Compliance Tests: Each landfill gas engine shall be tested to demonstrate initial compliance with the emissions standards for CO, NOx and VOC under 40 CFR 60, Subpart JJJJ as well as the BACT standards of this permit. In addition, each unit shall be tested for opacity in accordance with EPA Method 9. The initial performance test must be conducted within 60 days after achieving permitted capacity, but not later than 180 days after initial startup of each unit. *{Permitting Note: Since the BACT emission standards are more stringent than 40 CFR 60, Subpart JJJJ emission standards, compliance with the BACT emission standards will satisfy compliance with the 40 CFR 60, Subpart JJJJ emission standards.}* [Rules 62-212.400(BACT), 62-297.310(7)(a)1, F.A.C. and NSPS Subpart JJJJ in 40 CFR 60]

19. Periodic Compliance Tests: Every 8,760 engine hours or at least once every three years, whichever comes first, each landfill gas engine shall be tested to demonstrate compliance with the emissions standards for CO, NOx and VOC under 40 CFR 60, Subpart JJJJ as well as the BACT standards of this permit. During these periodic tests, at least one landfill gas engine shall also be tested for opacity in accordance with EPA Method 9. *{Permitting Note: Since the BACT emission standards are more stringent than 40 CFR 60, Subpart JJJJ emission standards, compliance with the BACT emission standards will satisfy compliance with the 40 CFR 60, Subpart JJJJ emission standards.}* [Rules 62-212.400(BACT), 62-297.310(7)(a)1 and 4, F.A.C., and NSPS Subpart JJJJ in 40 CFR 60]

20. Test Requirements: During each required compliance stack test, the permittee shall operate a tested landfill gas engine at permitted capacity (90% to 100% of 2,233 bhp). The permittee shall notify the Compliance Authority in writing at least 15 days prior to any scheduled stack tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit. *{Permitting Note: Although the NSPS provides for a 30-day test notification, a 15-day notice is sufficient in Florida.}* [Rule 62-297.310(7)(a)9, F.A.C.]

21. Test Methods: Tests required by this permit shall be performed in accordance with the following reference methods.

Method	Description of Method and Comments
1 - 4	Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content
7 or 7E	Determination of Nitrogen Oxide Emissions from Stationary Sources
9	Visual Determination of the Opacity of Emissions from Stationary Sources
10	Determination of Carbon Monoxide Emissions from Stationary Sources {Note: The method shall be based on a continuous sampling train.}
19	Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates (Optional F-factor method may be used to determine flow rate and gas analysis to calculate mass emissions in lieu of Methods 1-4.)
18	Measurement of Gaseous organic Compound Emissions by Gas Chromatography *{Note: the emission standards are based on VOC measured as methane.}*
25A	Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer *{Note: the emission standards are based on VOC measured as methane.}*
ALT-078	Clarification of Approval of an Alternative to Method 18 for 40 CFR Part 60, Subpart JJJJ

The above methods are described in Appendix A of 40 CFR 60 and are adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. ALT-078 method is included in the Appendices. [Rules 62-204.800, 62-212.400(BACT) and Appendix A of 40 CFR 60]

22. LFG Composition Analysis: The following methods shall be used to satisfy the sampling/analysis of LFG:

    a. Sulfur Content: ASTM Method D5504-01 or equivalent.

    b. Chlorine Content: Modified EPA Method TO-15 or equivalent.

    c. The LFG shall be collected and transported in an appropriate canister (e.g. SUMMA®, Bottle-Vac Sampler or equivalent).

[Rule 62-4.070(3), F.A.C.]

MONITORING REQUIREMENTS

23. Landfill Gas Sampling/Analysis: At least semiannually, the permittee shall obtain the following representative samples of landfill gas: a sample taken during each required compliance stack test; and a sample taken during the next semiannual period. A representative sample shall be taken in each calendar semiannual period (January – June and July – December) approximately six months apart. Each gas sample shall be collected under normal operating conditions (i.e., with valves open for all operating cells) by appropriate canister (e.g. SUMMA®, Bottle-Vac Sampler or equivalent). Each sample shall have an ultimate analysis conducted for at least sulfur and chlorine. Results shall also be reported as SO_2 and HCl emission factors in terms of lb/million standard cubic feet (lb/MMscf) of landfill gas. Based on the sampling results and Rule 62-297.310(7)(b)(Special Compliance Tests), F.A.C., the Compliance Authority may request additional gas sampling and analyses. [Rules 62-210.200 and 62-212.400, F.A.C.]

24. Monthly Records: Within ten calendar days following each month, the permittee shall observe and record the following information in a written log: number of hours of operation of each engine; total monthly landfill gas flow rate to all engines combined; and HCl and SO_2 emissions for the month and previous 12 months, rolling total. Emissions of HCl and SO_2 shall be calculated from the monthly fuel consumption as well as the analytical results for the chlorine and sulfur contents of the landfill gas representative of the given month of operation based on the semiannual sampling for that period. [Rule 62-210.200 (232), F.A.C.]

RECORDS AND REPORTS

25. Test Reports: The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA test, shall provide the applicable information identified in Rule 62-297.310(8)(c). [Rule 62-297.310(8), F.A.C.]