

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 092012-009

Project Number: 2012-02-068

Installation Number: 011-0031

Parent Company: City of Lamar

Parent Company Address: 1104 Broadway, Lamar, MO 64759

Installation Name: City of Lamar

Installation Address: Northwest of Highway 71 and DD Intersection, Lamar, MO 64759

Location Information: Barton County, S2, T32N, R31W

Application for Authority to Construct was made for:

The installation of two landfill gas (LFG) - fired generators. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

SEP 27 2012

EFFECTIVE DATE


DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 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 AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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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 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 (12)(A)10. "Conditions required by permitting authority."

City of Lamar
Barton County, S2, T32N, R31W

1. Emissions Limits
 - A. The City of Lamar shall not emit more than 40.0 tons of nitrogen oxides (NO_x) and 100.0 tons of carbon monoxide (CO) from the two landfill gas (LFG) generators (EP-07, EP-08) in any consecutive 12-month period.
 - B. Attachment A and B, or equivalent forms approved by the Air Pollution Control Program, such as electronic forms, shall be used to demonstrate compliance with Special Condition 1.A. and 1.B.
2. Performance Testing
 - A. The City of Lamar shall conduct performance testing of the two (2) LFG-fired generators for NO_x, CO and volatile organic compounds (VOC, as propane) emissions to demonstrate compliance with the New Source Performance Standards (NSPS) Subpart JJJJ, *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*, within 180 days after startup.
 - B. A completed Proposed Test Plan Form (enclosed) must be submitted to the Air Pollution Control Program 30 days prior to the proposed test date so that the Air Pollution Control Program may arrange a pretest meeting, if necessary, and assure that the test date is acceptable for an observer to be present. The Proposed Test Plan may serve the purpose of notification and must be approved by the Director prior to conducting the required emission testing.
 - C. Two copies of a written report of the performance test results shall be submitted to the Director within 60 days of completion of any required testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required U.S. EPA Method for at least one sample run.

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SPECIAL CONDITIONS:

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

- D. The test report is to fully account for all operational and emission parameters addressed both in the permit conditions as well as in any other applicable state or federal rules or regulations.
3. Record Keeping and Reporting Requirements
- A. The City of Lamar shall maintain all records required by this permit for not less than five years and shall make them available to any Missouri Department of Natural Resources' personnel upon request.
 - B. The City of Lamar shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2012-02-068
Installation ID Number: 011-0031
Permit Number:

City of Lamar
Northwest of Highway 71 and DD Intersection
Lamar, MO 64759

Complete: February 24, 2012

Parent Company:
City of Lamar
1104 Broadway
Lamar, MO 64759

Barton County, S2, T32N, R31W

REVIEW SUMMARY

- The City of Lamar has applied for authority to construct two (2) 1,350 Kilowatt (KW) landfill gas (LFG) -fired generators to provide electricity for distribution.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment but only in amounts below the *de minimis* and Screening Model Action Levels (SMAL).
- 40 CFR Part 60, Subpart JJJJ, *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*, of the New Source Performance Standards (NSPS) applies to the proposed equipment.
- The City of Lamar uses an LFG treatment system to process the gas prior to combustion. 40 CFR Part 60, Subpart WWW, *Standards of Performance for Municipal Solid Waste Landfills*, of the NSPS applies to this treatment system.
- 40 CFR Part 63, Subpart ZZZZ, *National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, of the Maximum Achievable Control Technology (MACT) regulations applies to the proposed equipment. However, for these engines, the only requirement in Subpart ZZZZ is that they meet the requirements of 40 CFR Part 60, Subpart JJJJ .
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation.
- No air pollution control equipment is being used in association with the new equipment.
- This review was conducted in accordance with Section (5) of Missouri State Rule

10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are less than their respective *de minimis* level.

- This installation is located in Barton County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed because potential emissions of the application are below the *de minimis* levels.
- Emissions testing is required by the NSPS, Subpart JJJJ, within one year of startup. However, the facility has agreed to complete the performance testing within 180 days after startup so that emission factors can be obtained to track annual emissions.
- An application to modify the facility's Part 70 Operating Permit is required with one (1) year of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

The City of Lamar currently operates two (2) Caterpillar G3520C LFG - fired generators. Four (4) diesel generators were also permitted, but they were sold and removed in March, 2012. The facility is a minor source for construction permits and a Part 70 source for operating permits.

The following New Source Review permits have been issued to City of Lamar from the Air Pollution Control Program.

Table 1: Permit History

Permit Number	Description
062000-013	Installation of four diesel generators.
102008-004	Installation of two LFG-fired generators.
102008-004A	Re-evaluate emissions based on stack testing results.
102008-004B	Revise emissions limits.

PROJECT DESCRIPTION

The City of Lamar has applied to install two LFG - fired Gauscor HGM 560 generators, each rated at 1,350 Kilowatts (KW). The maximum hourly heat input rate is 11.2473 million British Thermal Units per hour (MMBtu/hr) each. With a fuel heating value of 479 Btu/scf for the LFG, the amount of LFG combusted by the engine at 100% loading is calculated to be 0.02348 mmcf/hr. The fuel heating value is the weighted average of the heating value from each component in the LFG. The LFG content was determined from a fuel analysis performed in October, 2011.

The LFG will be supplied by a landfill owned by Republic Services, Inc. The new generators will be installed at the same site as the two existing Caterpillar G3520 LFG - fired engines and be considered part of the same installation as the other generators owned by the City of Lamar.

EMISSIONS/CONTROLS EVALUATION

Nitrogen oxides (NO_x), carbon monoxide(CO), and volatile organic compounds (VOC) emissions were calculated using the emission limits in NSPS Subpart JJJJ. VOC potential emissions were determined to be under the *de minimis* level. NO_x and CO emissions were calculated to be greater than their respective *de minimis* levels. NO_x emissions are limited to 40.0 tons per year and the CO emissions are limited to 100.0 tons per year as a condition of this permit so the facility would not have to model NO_x or CO emissions. Emission factors derived from the most recent NSPS Subpart JJJJ performance tests shall be used in Attachment A and B to show compliance with these emission limits. NSPS Subpart JJJJ allows the facility up to one year after startup to perform the stack tests. However, the facility agreed to perform the emissions tests within 180 days after startup to establish emission factors and calculate the actual emissions.

Sulfur Oxide (SO_x) emissions were calculated from mass balances assuming complete combustion of hydrogen sulfide (H₂S) to SO_x. The H₂S content (50 parts per million by volume, ppmv) was taken from a previous test performed in 2010. Particulate matter (PM) emissions were calculated using the PM emission factor from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 2.4, *Municipal Solid Waste Landfills*, 11/98, Table 2.4-5. This section states that most of the PM will be less than two-and-a-half microns in diameter. Therefore, emissions of particulate matter less than two-and-a-half microns in diameter (PM_{2.5}) and particulate matter less than ten microns in diameter (PM₁₀) were also calculated using the PM emission factor. Individual HAP emissions were calculated from either mass balances using the default concentration of the HAP in the LFG and assuming 92.0% control efficiency from the LFG engine (obtained from AP-42, Chapter 2.4) or from emission factors in AP-42, Chapter 3.1, *Stationary Gas Turbines*, (4/2000).

The LFG consists of mainly methane (CH₄) and carbon dioxide (CO₂). The CH₄ will be converted to CO₂ during the combustion process while the original CO₂ contained in the LFG will be emitted without being converted. The CO₂ emissions from the CH₄ combustion process were calculated using emission factors in 40 CFR §98.33, *Calculating GHG Emissions*. The CO₂ emissions from the LFG were calculated assuming 34.1% by volume CO₂, which is taken from a fuel analysis performed by the City of Lamar in October, 2011. Nitrous oxide (N₂O) emissions from combustion of LFG were calculated using an emission factor in 40 CFR §98.33.

The greenhouse gas (GHG)-mass based emissions were calculated by summing the CO₂, CH₄ and N₂O emissions. The CO₂ equivalent (CO₂e)-based emissions were calculated by multiplying the CO₂, CH₄ and N₂O by their respective 100-year Global Warming Potential (GWP) and summing the results.

Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8,760 hours per year).

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	¹ Existing Potential Emissions	Existing Actual Emissions (2011 EIQ)	Potential Emissions of the Application	New Project Conditioned Potential	New Installation Conditioned Potential
PM	25.0	N/D	N/D	5.40	N/A	N/A
PM ₁₀	15.0	6.53	5.09	5.40	N/A	N/A
PM _{2.5}	10.0	N/D	N/D	5.40	N/A	N/A
SO _x	40.0	2.20	1.69	2.07	N/A	N/A
NO _x	40.0	<40.0	39.11	69.91	<40.0	N/A
VOC	40.0	<38.0	8.23	34.96	N/A	N/A
CO	100.0	<139.3	118.81	174.78	<100.0	N/A
GHG Mass	² 0.0/100.0/250.0	N/D	N/D	18,739	N/A	N/A
CO ₂ e	² 75,000/100,000	N/D	N/D	18,795	N/A	N/A
HAPs	10.0/25.0	0.24	N/D	0.09	N/A	N/A

Note 1: Existing potential emissions taken from permit 102008-004 or 102008-004B.

Note 2: Regulatory Prevention of Significant Deterioration (PSD) permit trigger levels. For this project, PSD permitting is needed only if the potential emissions of GHG from the project alone would be equal to or greater than 100,000 tpy on a CO₂e basis **and** 250 tpy on a mass basis.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are less than their respective de minimis levels.

APPLICABLE REQUIREMENTS

City of Lamar shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Stationary Spark Ignition Internal Combustion Engines* 40 CFR Part 60, Subpart JJJJ
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Municipal Solid Waste Landfills*, 40 CFR Part 60, Subpart WWW
- *Maximum Achievable Control Technology (MACT) Regulations*, 10 CSR 10-6.075, *National Emission Standards for Stationary Reciprocating Internal Combustion Engines*, 40 CFR Part 63, Subpart ZZZZ
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

Chia-Wei Young
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated 2/17/2012 received 2/24/2012 designating the City of Lamar as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

Mr. Lynn Calton
City Administrator
City of Lamar
1104 Broadway
Lamar, MO 64759

RE: New Source Review Permit - Project Number: 2012-02-068

Dear Mr. Calton:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact Chia-Wei Young, at the Department of Natural Resources' Air Pollution Control Program, 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

Susan Heckenkamp
New Source Review Unit Chief

SH:cyl

Enclosures

c: Southwest Regional Office
PAMS File: 2012-02-068

Permit Number: