

**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: **122013-003**

Project Number: 2013-05-048

Installation Number: 159-0075

Parent Company: State Fair Community College

Parent Company Address: 3201 W. 16th Street, Sedalia, MO 65301

Installation Name: Missouri Center for Waste to Energy

Installation Address: 24409 Oak Grove Lane, Sedalia, MO 65301

Location Information: Pettis County, S36, T46N, R22W

Application for Authority to Construct was made for:
two reciprocating internal combustion engines (EU-1 and EU-2) fueled exclusively by landfill gas (LFG) from Central Missouri Landfill. 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.

DEC - 3 2013

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 startup 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 startup 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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Project No.	2013-05-048

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."

Missouri Center for Waste to Energy
Pettis County, S36, T46N, R22W

1. NO_x Emission Limitation
 - A. Missouri Center for Waste to Energy shall emit less than 40.0 tons of NO_x in any consecutive 12-month period from EU-1 and EU-2.
 - B. Attachment A or equivalent forms, such as electronic forms, preapproved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 1.A.
2. CO Emission Limitation
 - A. Missouri Center for Waste to Energy shall emit less than 100.0 tons of CO in any consecutive 12-month period from EU-1 and EU-2.
 - B. Attachment B or equivalent forms, such as electronic forms, preapproved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 2.A.
3. Record Keeping and Reporting Requirements
 - A. Missouri Center for Waste to Energy shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
 - B. Missouri Center for Waste to Energy 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 shows an exceedance of a limitation imposed by this permit.

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SPECIAL CONDITIONS:

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

4. Performance Testing

A. Missouri Center for Waste to Energy shall conduct initial and subsequent performance testing on each engine (EU-1 and EU-2) to determine respective NO_x, VOC, and CO emission factors.

I. The emission tests shall provide emission factors for a full range of loads on the engines (i.e. 50, 75, and 100 percent). The tests shall be conducted to represent, at a minimum, three different operational loads for each pollutant. One 3-run test set shall be conducted with the emission unit operating at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate (Table 1) allowed by the permit. If it is impractical to test at permitted capacity, an emission unit may be tested at less than the maximum permitted capacity; in this case, subsequent engine operation is limited to 110 percent of the test rate until a new test is conducted. Once the engine is so limited, operation at higher capacities is allowed for no more than 15 total days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity.

Table 1: Maximum Operation Rate

Emission Unit	Engine Power (brake hp)	LFG Flowrate (scf/hr)	Generator Output (eKW)
EU-1	1,468	29,143	1,050
EU-2	1,966	33,074	1,421

II. The tests shall be completed in accordance with the procedures outlined in Special Condition 4 and 40 CFR 60 Subpart JJJJ.

III. NO_x and CO emission factors (gram/hp) shall be developed from the most recent performance tests to be used to determine compliance with Special Condition 1 and Special Condition 2, and 40 CFR 60 Subpart JJJJ.

B. The initial tests shall be performed within 60 days after achieving the maximum production rate of the engines, but not later than 180 days after initial start-up. The subsequent tests shall be performed every 8,760 hours of operation or three years, whichever comes first, thereafter.

C. 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

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SPECIAL CONDITIONS:

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

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.

- D. Two copies of a written report of the performance test results shall be submitted to the Environmental Protection Agency, Air and Waste Management Division, 11201 Renner Blvd., Lenexa, KS 66219, within 60 days of testing completion. Copy the Air Pollution Control Program on all correspondence. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required EPA Method for at least one sample run.
- E. 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.
- F. If the performance testing indicates peak load outside of the permitted capacity established in Special Condition 4.A.I. or indicates emission rates exceeding the values in Table 2, Missouri Center for Waste to Energy shall submit a construction permit amendment application to the Air Pollution Control Program within 60 days of submitting the test report required by Special Condition 4.D.

Table 2: Emission Limits (gram/hp)

Emission Unit	NOx	VOC	CO
EU-1	2.0	1.0	5.0
EU-2	2.0	1.0	5.0

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

Project Number: 2013-05-048
Installation ID Number: 159-0075
Permit Number:

Missouri Center for Waste to Energy
24409 Oak Grove Lane
Sedalia, MO 65301

Complete: June 14, 2013

Parent Company:
State Fair Community College
3201 W. 16th Street
Sedalia, MO 65301

Pettis County, S36, T46N, R22W

REVIEW SUMMARY

- Missouri Center for Waste to Energy has applied for authority to install two reciprocating internal combustion engines (EU-1 and EU-2) fueled exclusively by LFG from Central Missouri Landfill.
- HAP emissions are expected from the incomplete combustion of LFG. Also, HAP emissions are generated by the landfill and reduced by varying efficiencies by the engines.
- 40 CFR 60 Subpart JJJJ, *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines* applies to the engines.
- None of the NESHAPs under 40 CFR 61 apply to this installation.
- 40 CFR 63 Subpart ZZZZ, *National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, applies to the engines.
- The engines reduce VOC, NMOC, HAPs, and CH₄ collected from the landfill, but are sources of PM, PM₁₀, PM_{2.5}, SO_x, NO_x, CO, CO₂, and other combustion products.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of NO_x and CO are conditioned below the respective de minimis level. Potential emissions of other pollutants remain below respective de minimis levels.
- This installation is located in Pettis 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 since potential emissions of the application are limited below de minimis levels.
- Emissions testing is required for the engines.
- A part 70 operating permit application is required for Missouri Center for Waste to Energy within 1 year of either engine's startup. Permit type is based upon the combined landfill/waste to energy installation which is a major source. The combined installation is also subject to NSPS WWW with a design capacity greater than or equal to 2.5 million megagrams and 2.5 million cubic meters, thereby requiring a part 70 or 71 permit.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Missouri Center for Waste to Energy is a new source consisting of two spark ignition reciprocating internal combustion engine (SI RICE) electrical generators. The engines are fueled exclusively by LFG. The source is located on property owned by Central Missouri Landfill (ID 159-0055) in Sedalia. No permits have been issued to Missouri Center for Waste to Energy from the Air Pollution Control Program. However, the following permits have been issued to the Central Missouri Landfill. The landfill is a major GHG (CO₂e), NMOC, and HAP source for construction permit applicability.

Table 3: Central Missouri Landfill Permit History

Permit Number	Description
OP	Operating permit issued September 25, 2001, project 1999-08-150
OP	Operating permit issued March 10, 2004, project 2004-02-102
102004-007	Landfill expansion
OP2006-084	Part 70 operating permit
112010-009	Landfill expansion
OP2013-017	Part 70 operating permit
112012-013	Landfill expansion and flare

Missouri Center for Waste to Energy and Central Missouri Landfill are one installation for permitting applicability. In order to be one installation, three criteria must be met: the facilities are located on contiguous or adjacent property, the facilities are under common control, and the facilities share the same two-digit (major group) Standard Industrial Classification (SIC) code (or one facility is considered a support facility to the other). According to the permit application, the waste to energy facility leases property from the landfill. Therefore, the facilities are continuous or adjacent. The waste to energy facility has the right to purchase all of the LFG, and the LFG is the engines' sole fuel source. Based upon the lease and the dependency of the waste to energy facility upon the landfill for fuel, the facilities are under common control. Both the waste to energy facility and landfill belong to the same two-digit (major group) Standard Industrial Classification

(SIC) Code of 49, pertaining to Electric, Gas, and Sanitary Services. Therefore, the last criterion for single installation status has been met.

PROJECT DESCRIPTION

Each engine is a 20 cylinder, lean burn, four-stroke, SI RICE. The manufacturer confirms that each engine complies with NSPS JJJJ, but each engine is not part of a required or voluntary certification program and is classified as non-certified per NSPS JJJJ.

EU-1 is a GE Jenbacher model J 320 GS-C81, with a total displacement of 2,970 cubic inches, manufactured on May 30, 2013, delivered on July 1, 2013. The genset package model number is JGS 320 GS-L.L.

EU-2 is a GE Jenbacher model J 420 GS-B81, with a total displacement of 3,728 cubic inches, manufactured on August 15, 2013, delivered on September 23, 2013. The genset package model number is JGS 420 GS-L.L.

LFG will be conditioned by the landfill to remove leachate and condensate before arriving at Missouri Center for Waste to Energy. Once at Missouri Center for Waste to Energy, the LFG will be further conditioned using iron sponge to decrease the hydrogen sulfide content. This is done to reduce potential acid formation and subsequent damage to the engines. This review considers hydrogen sulfide reduction an inherent step within the waste to energy process, therefore it is not required by a permit special condition.

EMISSIONS/CONTROLS EVALUATION

The NO_x, VOC, and CO emission factors used in this analysis were obtained from the emission standards in NSPS JJJJ. LFG fueled engines are subject to variable fuel inputs, atmospheric conditions, and tuning specifications that can cause a range of emission values. In order to not require the engines to operate at a possibly difficult to maintain, precise calibration based upon a one-time performance test, the engines' potential emissions have been updated to reflect the higher NSPS standards.

Potential PM, PM₁₀, PM_{2.5} emissions were calculated using the emission factor of 48 pounds per MMSCF of methane. The engines' maximum LFG input rate was converted to methane input rate using the default LFG methane concentration of 55 percent obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 2.4 *Municipal Solid Waste Landfills*, November 1998. Per AP-42 Table 2.4-5 all particulate matter was assumed PM_{2.5}.

Potential SO_x emissions were calculated using the AP-42 default LFG sulfur concentration of 46.9 ppmv, sulfur combustion stoichiometry, and the ideal gas law.

Potential HAP emissions were calculated using the AP-42 default LFG concentrations in Table 2.4-1 and Table 2.4-2, the ideal gas law, and the typical speciated control efficiencies in Table 2.4-3. The HAPs in Tables 2.4-1 and 2.4-2 were checked against

the *Table of Hazardous Air Pollutants, Screening Model Action Levels, and Risk Assessment Levels*, Revision 10, May 3, 2012 from the Missouri Department of Natural Resources Air Pollution Control Program. Any delisted HAP was removed from this review.

Potential NMOC emissions were calculated using the NSPS JJJJ VOC emission standard and the AP-42 default NMOC/VOC mass relationship of 1 part NMOC to 0.85 part VOC.

Potential CO₂ emissions can be calculated using AP-42 Section 2.4 Equations 4 and 6 or 40 CFR 98 Table C-1. Comparison of the potential emissions shows a slightly more conservative estimate using 40 CFR 98, therefore this method was used for this review. The 40 CFR 98 CO₂ emission factor is based upon MMBtu of “biogas (captured methane)”. This unit of measure is unclear, as LFG is not purely methane. However, since the emission factor is based upon heat content it appears the emission factor would be based upon the portion of the LFG with a combustible heat content, i.e. the methane, not the CO₂.

AP-42 and 40 CFR 98 have different higher heating values (HHV) for LFG compared to biogas, respectively. Since this project is based upon LFG, the AP-42 default LFG methane content of 55 percent was used, resulting in 557 btu/scf LFG. Although it would result in higher PTE, the 40 CFR 98 biogas HHV of 841 btu/scf LFG was not used as the biogas source type could not be confirmed. Also, this HHV equates to approximately 83 percent methane.

Comparison of the AP-42 and 40 CFR 98 CO₂ calculation methods reveals neither method accounts for the CO₂ present in the LFG. This portion was assumed unchanged in the engines and was summed with the CO₂ created from the methane combustion. CO₂ emissions were included in this review due to the July 12, 2013 vacated *Deferral for CO₂ Emissions from Bioenergy and Other Biogenic Sources Under the Prevention of Significant Deterioration (PSD) and Title V Programs*.

Potential methane and N₂O emissions were calculated using emission factors obtained from 40 CFR 98 Table C-2. GHG (CO₂e) potential emissions were calculated using the 100-year global warming potentials obtained from 40 CFR 98 Table A-1, October 30, 2009.

Potential hydrogen sulfide emissions are expected to be negligible due to the combination of LFG pretreatment equipment and RICE destruction efficiency.

The following table provides an emissions summary for this project. Existing potential emissions are the summation of potential emissions from permit 112012-013 at the total design capacity of the landfill. This is a conservative calculation as it assumes all cells have the same closure date and each cell's LFG generation rate peaks at the same time. The existing potential emissions do not include potential emissions from haul roads and daily cover activities, and including or omitting them does not change permit applicability. The existing potential emissions include CO₂ as the biogenic deferral has been vacated. Installation-wide potential emissions are provided in operating permit

OP2013-017; however they were not relied upon for this review since they did include fugitive emissions at the installation. .

Conditioned potential emissions of the project represent the potential of the engines, assuming continuous operation (8,760 hours per year), but with voluntary NO_x and CO limits to avoid ambient air impact quality analysis. A limit for each pollutant is needed because due to the relationship between combustion generated NO_x and CO, limiting one does not proportionately reduce the other. Also, attempting to proportionately reduce either pollutant results in the other pollutant being conditioned almost exactly to the respective de minimis level, with no margin of safety for actual operation variables.

The new installation potential emissions are the summation of the existing potential emissions and the conditioned potential emissions of the project. They conservatively assume the landfill flare and the engines operate at 8,760 hours per year each. Like the existing potential emissions, the new installation potential emissions also conservatively assume all cells have the same closure date and each cell's LFG generation rate peaks at the same time. They also do not include potential emissions from haul roads and daily cover activities. CO₂ is included as the biogenic deferral has been vacated.

Table 4: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2012 EIQ)	Unconditioned Potential Emissions of the Project	Conditioned Potential Emissions of the Project	New Installation Potential Emissions
PM	25.0	0.98	N/D	4.43	2.67	3.65
PM ₁₀	15.0	3.93	13.11	4.43	2.67	6.60
PM _{2.5}	10.0	3.93	1.31	4.43	2.67	6.60
SO _x	40.0	3.23	N/A	2.09	1.26	4.49
NO _x	40.0	9.25	N/A	66.32	< 40.0	49.25
VOC	40.0	213.85	12.64	33.16	20.00	233.85
CO	100.0	173.45	N/A	165.80	< 100.0	273.45
GHG (CO ₂ e)	75,000 / 100,000	271,701.60	N/D	19,272.92	11,624.36	283,325.96
GHG (mass)	0.0 / 100.0 / 250.0	81,361.66	N/D	19,219.63	11,592.21	92,953.87
HAPs	10.0/25.0	26.90	1.62	2.00	1.21	28.11
NMOC	50.0	251.59	N/D	39.01	23.53	275.12

N/A = Not Applicable; N/D = Not Determined

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 NO_x and CO are conditioned below the respective de minimis level. Potential emissions of other pollutants remain below respective de minimis levels.

APPLICABLE REQUIREMENTS

Missouri Center for Waste to Energy 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 does not apply to either engine as they are fueled exclusively by a gaseous fuel and air introduced for purposes of combustion, and therefore do not meet the definition of process weight according to 10 CSR 10-6.020(2)(P).
- *New Source Performance Regulations*, 10 CSR 10-6.070
 - *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*, 40 CFR Part 60, Subpart JJJJ applies to the engines. The engines are subject to emission standards, performance testing, notification, recordkeeping and reporting requirements. Please consult your operating permit for complete requirements. Prior to operating permit issuance, the regulation should be consulted for specific requirements.
- *MACT Regulations*, 10 CSR 10-6.075
 - *National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 CFR Part 63, Subpart ZZZZ applies to the engines. The combined landfill/engines installation is a major HAP source. The engines are subject to monitoring, installation, collection, operation and maintenance, initial notification, recordkeeping and reporting requirements. The engines are not subject to emission limitations or performance testing under MACT ZZZZ. At this time, the Air Pollution Control Program has not accepted implementation and enforcement delegation of this regulation. Please consult your operating permit and EPA Region 7 at the address in Special Condition 4.D. for complete requirements, and copy the Air Pollution Control Program Compliance/Enforcement Section on all EPA correspondence.

- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260 applies to the engines. SO₂ compliance is assumed using the following equation. SO₃ and sulfuric acid compliance is assumed due to the low SO₂ concentration and also assuming most of the SO_x is SO₂.

$$\text{ppmv SO}_2 = [(Engine\ 1\ SO_x\ PTE\ 0.2238\ lb/hr) / (Engine\ 1\ dry\ exhaust\ rate\ 11,976\ lb/hr) * 1,000,000 * \text{ppmm to ppmv SO}_2\ conversion\ 0.452] = 8.45$$

8.45 ppmv < 500 ppmv, therefore in compliance with wide margin and testing is not required according to 10 CSR 10-6.260(3)(A)4. Engine 2 is also in compliance using this method.

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.

David Little
New Source Review Unit

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated May 20, 2013, received May 22, 2013, designating State Fair Community College as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

Attachment A – NO_x Compliance Worksheet

Missouri Center for Waste to Energy
 Pettis County, S36, T46N, R22W
 Project Number: 2013-05-048
 Installation ID Number: 159-0075
 Permit Number: _____

This sheet covers the period from _____ to _____. Copy this sheet as needed.
 (month, year) (month, year)

A	B	C	D	E	F	G	H	I
Month, Year	Emission Unit, Description	Output (eKW / month)	NO _x Emission Factor (gram / hp)	NO _x Emissions (lbs/month)	NO _x Emissions (tons/month)	12-month NO _x Emissions from Previous Month (tons)	Monthly NO _x Emissions from This Month Last Year (tons)	12-month NO _x Emissions (tons)
<i>example</i>	EU-1, J320	600,000	0.97	1,811.18	2.20	30.21	2.79	29.62
	EU-2, J420	852,000	0.98	2,598.39				
<i>example</i>	EU-1, J320	651,081	0.97	1,965.38	2.22	29.62	3.08	28.76
	EU-2, J420	812,317	0.98	2,477.37				
	EU-1, J320							
	EU-2, J420							
	EU-1, J320							
	EU-2, J420							
	EU-1, J320							
	EU-2, J420							
	EU-1, J320							
	EU-2, J420							
	EU-1, J320							
	EU-2, J420							
	EU-1, J320							
	EU-2, J420							

- A. Record the current month and year.
- B. Emission unit and description.
- C. Record each unit's total electric kilowatt output for this month.
- D. NO_x emission factors. Record the highest, 3-run average, most recent value from performance testing for the engines. Until the engines are tested use 2.0 gram / hp.
- E. Calculate each unit's NO_x emissions. $E = [(C \times D \times 1.341) / (0.95 \times 453.5924)]$, where 1.341 hp = 1 KW, 0.95 = mechanical to electrical efficiency at 0.8 power factor, 453.5924 grams = 1 lb.
- F. Calculate the current month's NO_x emissions. $F = (E_1 + E_2) / 2,000$.
- G. Record the 12-month NO_x emissions (I) from the previous month.
- H. Record the monthly NO_x emissions (F) from this month last year.
- I. Calculate the current month's NO_x emissions. $I = F + G - H$. A value less than 40.0 tons indicates compliance.

Attachment B – CO Compliance Worksheet

Missouri Center for Waste to Energy
 Pettis County, S36, T46N, R22W
 Project Number: 2013-05-048
 Installation ID Number: 159-0075
 Permit Number: _____

This sheet covers the period from _____ to _____. Copy this sheet as needed.
 (month, year) (month, year)

A	B	C	D	E	F	G	H	I
Month, Year	Emission Unit, Description	Output (eKW / month)	CO Emission Factor (gram / hp)	CO Emissions (lbs/month)	CO Emissions (tons/month)	12-month CO Emissions from Previous Month (tons)	Monthly CO Emissions from This Month Last Year (tons)	12-month CO Emissions (tons)
<i>example</i>	EU-1, J320	600,000	4.2	7,842.24	9.62	80.56	10.11	80.07
	EU-2, J420	852,000	4.3	11,401.12				
<i>example</i>	EU-1, J320	651,081	4.2	8,509.89	9.69	80.07	8.76	81.00
	EU-2, J420	812,317	4.3	10,870.10				
	EU-1, J320							
	EU-2, J420							
	EU-1, J320							
	EU-2, J420							
	EU-1, J320							
	EU-2, J420							
	EU-1, J320							
	EU-2, J420							
	EU-1, J320							
	EU-2, J420							
	EU-1, J320							
	EU-2, J420							

- A. Record the current month and year.
- B. Emission unit and description.
- C. Record each unit's total electric kilowatt output for this month.
- D. CO emission factors. Record the highest, 3-run average, most recent value from performance testing for the engines. Until the engines are tested use 5.0 gram / hp.
- E. Calculate each unit's CO emissions. $E = [(C \times D \times 1.341) / (0.95 \times 453.5924)]$, where 1.341 hp = 1 KW, 0.95 = mechanical to electrical efficiency at 0.8 power factor, 453.5924 grams = 1 lb.
- F. Calculate the current month's CO emissions. $F = (E_1 + E_2) / 2,000$.
- G. Record the 12-month CO emissions (I) from the previous month.
- H. Record the monthly CO emissions (F) from this month last year.
- I. Calculate the current month's CO emissions. $I = F + G - H$. A value less than 100.0 tons indicates compliance.

APPENDIX A

Abbreviations and Acronyms

%	percent	m/s	meters per second
°F	degrees Fahrenheit	Mgal	1,000 gallons
acfm	actual cubic feet per minute	MW	megawatt
BACT	Best Available Control Technology	MHDR	maximum hourly design rate
BMPs	Best Management Practices	MMBtu	Million British thermal units
Btu	British thermal unit	MMCF	million cubic feet
CAM	Compliance Assurance Monitoring	MSDS	Material Safety Data Sheet
CAS	Chemical Abstracts Service	NAAQS ...	National Ambient Air Quality Standards
CEMS	Continuous Emission Monitor System	NESHAPs	
CFR	Code of Federal Regulations	National Emissions Standards for Hazardous Air Pollutants
CO	carbon monoxide	NO_x	nitrogen oxides
CO₂	carbon dioxide	NSPS	New Source Performance Standards
CO_{2e}	carbon dioxide equivalent	NSR	New Source Review
COMS	Continuous Opacity Monitoring System	PM	particulate matter
CSR	Code of State Regulations	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
dscf	dry standard cubic feet	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
EQ	Emission Inventory Questionnaire	ppm	parts per million
EP	Emission Point	PSD	Prevention of Significant Deterioration
EPA	Environmental Protection Agency	PTE	potential to emit
EU	Emission Unit	RACT	Reasonable Available Control Technology
fps	feet per second	RAL	Risk Assessment Level
ft	feet	SCC	Source Classification Code
GACT	Generally Available Control Technology	scfm	standard cubic feet per minute
GHG	Greenhouse Gas	SIC	Standard Industrial Classification
gpm	gallons per minute	SIP	State Implementation Plan
gr	grains	SMAL	Screening Model Action Levels
GWP	Global Warming Potential	SO_x	sulfur oxides
HAP	Hazardous Air Pollutant	SO₂	sulfur dioxide
hr	hour	tph	tons per hour
hp	horsepower	tpy	tons per year
lb	pound	VMT	vehicle miles traveled
lbs/hr	pounds per hour	VOC	Volatile Organic Compound
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		

Mr. David Albers
State Fair Community College
3201 W. 16th Street
Sedalia, MO 65301

RE: New Source Review Permit - Project Number: 2013-05-048

Dear Mr. Albers:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. 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 pending 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 David Little, 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:dlk

Enclosures

c: Kansas City Regional Office
PAMS File: 2013-05-048

Permit Number: