

Commonwealth of Kentucky
Division for Air Quality
STATEMENT OF BASIS

Title V, Construction/Operating
Permit: V-24-033
East Kentucky Power Cooperative, Inc. in care of Green Valley Landfill
Ashland, KY 41102
November 14, 2024
Kayla Thurman, Reviewer
SOURCE ID: 21-089-00040
AGENCY INTEREST: 40578
ACTIVITY: APE20240002, APE20240003

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SECTION 1 – SOURCE DESCRIPTION

SIC Code: 4911

Single Source Det. ☒ Yes ☐ No If Yes, Affiliated Source AI: 1592

Source-wide Limit ☐ Yes ☒ No If Yes, See Section 4, Table A

28 Source Category ☐ Yes ☒ No If Yes, Category:

County: Greenup

Nonattainment Area ☒ N/A ☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ Ozone ☐ Lead

PTE* greater than 100 tpy for any criteria air pollutant ☒ Yes ☐ No

If yes, for what pollutant(s)?

☐ PM₁₀ ☐ PM_{2.5} ☒ CO ☐ NO_x ☐ SO₂ ☐ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☐ Yes ☒ No

If yes, for what pollutant(s)?

☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) ☒ Yes ☐ No

If yes, list which pollutant(s): Formaldehyde

PTE* greater than 25 tpy for combined HAP ☐ Yes ☒ No

*PTE does not include self-imposed emission limitations.

Description of Facility:

East Kentucky Power Cooperative, Inc. in care of Green Valley Landfill purchases and combusts treated landfill gas from Green Valley Landfill to produce energy.

SECTION 2 – CURRENT APPLICATION

Permit Number: V-24-033 Activities: APE20240002, APE20240003

Received: APE20240002 – June 6, 2024; APE20240003 – November 7, 2024

Application Complete Date(s): APE20240002 – June 20, 2024; APE20240003 – November 14, 2024

Permit Action: ☐ Initial ☒ Renewal ☒ Significant Rev ☐ Minor Rev ☐ Administrative

Construction/Modification Requested? ☒ Yes ☐ No

Previous 502(b)(10) or Off-Permit Changes incorporated with this permit action ☒ Yes ☐ No

Description of Action:

- APE20240003: Renewal of the Title V Permit
- APE20240002: Addition of EU 01-04, 1148 bhp Stationary RICE
- APE20230001: Replace EU 01-1 with a like engine
- APE20240001: Replace EU 01-2 with a like engine

V-24-033 Emission Summary				
Pollutant	2023 Actual (tpy)	Previous PTE V-17-046 (tpy)	Change (tpy)	Revised PTE V-24-033 (tpy)
CO	130.38	146.34	48.79	195.13
NO _x	59.27	66.52	22.18	88.70
PT	4.73	5.30	1.77	7.07
PM ₁₀	4.73	5.30	1.77	7.07
PM _{2.5}	4.73	5.30	1.77	7.07
SO ₂	22.79	25.58	0.25	25.83
VOC	32.90	36.93	12.3	49.23
Lead	0.00	0.00	0.00	0.00
Greenhouse Gases (GHGs)				
Carbon Dioxide	12,185	13,677	4,561	18,238
Methane	0.75	0.84	0.28	1.12
Nitrous Oxide	0.14	0.16	0.06	0.22
CO ₂ Equivalent (CO ₂ e)	12,247	13,756	4,574	18,330
Hazardous Air Pollutants (HAPs)				
Acetaldehyde	0.73	0.82	0.33	1.15
Acrolein	0.45	0.505	0.004	0.509
Formaldehyde	7.25	8.14	2.71	10.85
Hydrochloric Acid	-	0.79	0.26	1.05
Combined HAPs:	-	11.13	3.74	14.87

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS

Emission Units 01 – Internal Combustion Engines EU01-1, EU01-2, EU01-3, EU01-4

Initial Construction Date:

EU01-3: 6/3/2003

EU01-1: Initial construction 6/3/2003; Replaced 10/2023

EU01-2: Initial construction 6/3/2003; Replaced 1/2024

EU01-4: Proposed 9/2024; Manufactured 10/2/2006, originally located at EKPC Laurel Ridge (AI 40452)

Process Description:

These are 4SLB stationary SI RICE that combust only treated (filtered, de-watered, and compressed) landfill gas supplied by the adjacent Green Valley Landfill. Each engine is 1148 bhp Caterpillar G3516. EU 01-4 has a manufacture date of 10/2/2006.

Applicable Regulation:

401 KAR 63:002 Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines is applicable because these are stationary RICEs at a major source of HAP emissions.

Non-applicable Regulation:

401 KAR 60:005 Section 2(2)(eeee), 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines is non-applicable because the date of construction commencement is before the classification date 6/12/2006.

Comments:

No emission limitations apply to these emission units.

SO₂ emission factor accounts for H₂S concentration of 513 ppmv, from landfill testing

The emission factor used for formaldehyde is a conservative 40.5 lb/MMscf based upon a Michigan DEQ determination for a similar LGTE facility (same engines). This facility, Adrian Energy Associates, LLC, altered their emission factor after Caterpillar found increased formaldehyde emissions and updated the spec sheet.

EU01-1, 01-2, and 01-3 were tested in 2004 and 2008 (see Testing Requirements\Results). No further testing is required.

EU01-1 was replaced by an identical engine under APE20230001

EU01-2 was replaced by an identical engine under APE20240001

40 CFR 60, Subpart CCCC is not applicable to these units

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS (CONTINUED)

Testing Requirements\Results

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of Compliance Testing
EU01-1		NMOC as Hexane	401 KAR 50:045*	Initial Compliance	EPA Method 25A, EPA Method 18		18.38 ppm Hexane, 98.92% DRE		CMN20040001	3/3/2004
EU01-2		NMOC as Hexane	401 KAR 50:045*	Initial Compliance	EPA Method 25A, EPA Method 18		10.68 ppm Hexane, 98.27% DRE		CMN20040001	3/3/2004
EU01-3		NMOC as Hexane	401 KAR 50:045*	Initial Compliance	EPA Method 25A, EPA Method 18		9.43 ppm Hexane, 98.95% DRE		CMN20040001	3/3/2004
EU01-1		ppm CO	401 KAR 50:045	Initial Performance	EPA Method 10		585.87: 401.23 low: high ppm CO		CMN20080001	12/12/2008
EU01-2		ppm CO	401 KAR 50:045	Initial Performance	EPA Method 10		563.54: 365.79 low: high ppm CO		CMN20080001	12/12/2008

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of Compliance Testing
EU01-3		ppm CO	401 KAR 50:045	Initial Performance	EPA Method 10		506.66: 360.42 low: high ppm CO		CMN20080001	12/12/2008

Footnotes:

No testing requirements currently apply to these emission units unless requested by the Cabinet.

EPA Method 25A – THC

EPA Method 18 – CH₄

EPA Method 10 – CO

EPA Method 3A – O₂

EPA Methods 1 through 4 – Flow Rates

*Permit G-02-002 contained an emission limitation “to reduce nonmethane organic compounds (NMOC) by 98 weight percent or result in outlet NMOC emissions less than 20 parts per million by volume, dry basis as hexane at 3 percent oxygen.” The corresponding testing requirement was “to conduct a performance test for NMOC percent reduction...within 180 days of startup.”

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:

N/A

Table B - Summary of Applicable Regulations:

Applicable Regulations	Emission Unit
401 KAR 63:002 Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ) <i>National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines</i>	EU01-1 EU01-2 EU01-3, EU01-4

Table C - Summary of Precluded Regulations:

Table D - Summary of Non Applicable Regulations:

Non Applicable Regulations	Emission Unit
401 KAR 60:005 Section 2(2)(eeee), 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), <i>Standards of Performance for Stationary Spark Ignition Internal Combustion Engines</i>	EU01-1 EU01-2 EU01-3 EU01-4
401 KAR 60:005, Section 2(2)(bbbb) 40 C.F.R. 60.2000 through 60.2265, Tables 1 through 8 (Subpart CCCC), <i>Standards of Performance for Commercial and Industrial Solid Waste Incineration Units.</i>	EU01-1 EU01-2 EU01-3 EU01-4

Air Toxic Analysis

N/A

Single Source Determination

Green Valley Landfill is co-located with the East KY Power Coop – Green Valley Landfill Station Gas to Electric Plant (AI 40578) in Greenup County. These two entities also have SIC codes containing the same first two digits (49), and otherwise appear to be a single source. However, based on the information provided to the Division, these two entities do not share a common control relationship. Among other reasons, the two entities do not share employees, neither relies on the other for compliance with applicable regulations, and one does not exert control or have ownership over the other. If the relationship between these two entities were to change such that they become commonly controlled, the Division will reevaluate its position. Accordingly, based on available information, the Division has determined that these two entities constitute separate sources under regulation and will be treated as such.

SECTION 5 – PERMITTING HISTORY

Permit	Permit Type	Activity#	Complete Date	Issuance Date	Summary of Action	PSD/Syn Minor
G-02-002	Initial	APE20050001	--	3/14/2003	Initial Title V General Constructing / Operating Permit	N/A
G-07-002	Renewal	APE20070002	10/5/2007	2/19/2008	Permit Renewal	N/A
G-12-002	Renewal	APE20120001	10/14/2012	6/19/2013	Permit Renewal	N/A
V-17-046	Renewal	APE20170001	12/20/2017	5/17/2020	Permit Renewal	N/A

SECTION 6 – PERMIT APPLICATION HISTORY

N/A

APPENDIX A – ABBREVIATIONS AND ACRONYMS

AAQS	– Ambient Air Quality Standards
BACT	– Best Available Control Technology
Btu	– British thermal unit
CAM	– Compliance Assurance Monitoring
CO	– Carbon Monoxide
Division	– Kentucky Division for Air Quality
ESP	– Electrostatic Precipitator
GHG	– Greenhouse Gas
HAP	– Hazardous Air Pollutant
HF	– Hydrogen Fluoride (Gaseous)
MSDS	– Material Safety Data Sheets
mmHg	– Millimeter of mercury column height
NAAQS	– National Ambient Air Quality Standards
NESHAP	– National Emissions Standards for Hazardous Air Pollutants
NO _x	– Nitrogen Oxides
PM	– Particulate Matter
PM ₁₀	– Particulate Matter equal to or smaller than 10 micrometers
PM _{2.5}	– Particulate Matter equal to or smaller than 2.5 micrometers
PSD	– Prevention of Significant Deterioration
PTE	– Potential to Emit
SO ₂	– Sulfur Dioxide
TF	– Total Fluoride (Particulate & Gaseous)
VOC	– Volatile Organic Compounds
MMBtu/hr	– million BTU per hour