Commonwealth of Kentucky
Division for Air Quality

STATEMENT OF BASIS / SUMMARY

Title V, Construction/Operating
Permit: V-24-016 R1
Big Run Power Producers, LLC
1837 River Cities Drive
Ashland, KY 41102
March 24, 2025
Walker Reeves, EIT, Reviewer

SOURCE ID:	21-019-00134
AGENCY INTEREST:	128843
ACTIVITY:	APE20240001

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SECTION 1 – SOURCE DESCRIPTION

SIC Code and description: 4925, Mixed, Manufactured, or Liquefied Petroleum Gas Production and/or Distribution

Single Source Det. ☒ Yes ☐ No If Yes, Affiliated Source AI: 40319

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

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

County: Boyd
Nonattainment Area ☒ N/A ☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☐ Ozone ☐ Lead
If yes, list Classification:

PTE* greater than 100 tpy for any criteria air pollutant ☒ Yes ☐ No
If yes, for what pollutant(s)?
☐ PM_{10} ☐ $PM_{2.5}$ ☒ CO ☐ NO_X ☐ SO_2 ☒ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☐ Yes ☒ No
If yes, for what pollutant(s)?
☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☐ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) ☐ Yes ☒ No
If yes, list which pollutant(s):

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

*PTE does not include self-imposed emission limitations.

Description of Facility:
Big Run Power Producers (BRPP) is co-located at Boyd County Landfill in Ashland, Kentucky. These sources are considered a "single source" for Title V and PSD, and because Boyd County Landfill is required to obtain a Title V permit by 401 KAR 52:020, Section 1(4), BRPP must also obtain a Title V permit.

BRPP is a renewable natural gas plant that will receive collected landfill gas (LFG) from the adjacent Boyd County Landfill. The LFG will be treated during the refinement process. LFG may be redirected to the flare at Boyd County Landfill after H_2S removal. Each step of the process allows LFG to be destroyed by the thermal oxidizer or be routed to the back-up flare in the event that the plant is down or product gas is off-spec. No emissions may be vented directly to the atmosphere at any time.

SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM

Permit Number: V-24-016 R1 Activities: APE20240001

Received: October 27, 2024 Application Complete Date(s): December 24, 2024

Permit Action: ☐ Initial ☐ Renewal ☒ Significant Rev ☐ Minor Rev ☐ Administrative
Construction/Modification Requested? ☒Yes ☐No NSR Applicable? ☐Yes ☒No

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

Description of Action:
Big Run Power Producers submitted an application for a significant revision to the Title V permit in October 2024. This revision requests the addition of a back-up flare, Emission Unit 04, to the facility to bring the design in line with that of other Archaea facilities. The back-up flare will be used to destroy the landfill gas that is separated out during the refinement process and off-spec product gas. These gasses were originally routed back to Boyd County Landfill for destruction in Rumpke's flare. Now, landfill gas will only be routed back to the Rumpke flare if the RNG plant is down after initial treatment.

As part of the significant revision, emissions were updated with the final version of AP-42 Chapter 2.4 emission factors published in August 2024. Previously, the Division was utilizing the draft version of Chapter 2.4 which is substantially different from the final version. Although the emission summary below is being updated, there are no actual changes to the combined facility PTE as emissions that were previously counted solely on Boyd County Landfill's permit are now additionally counted on Big Run Power Producers' permit. However, worst case emissions are still defined by the destruction of landfill gas in Boyd County Landfill's flare.

No LFG can be vented uncontrolled to the atmosphere.

V-24-016 R1 Emission Summary				
Pollutant	2024 Actual (tpy)	Previous PTE V-24-016 (tpy)	PTE V-24-016 R1 (tpy)	Combined Facility PTE* (tpy)
CO	6.43	7.36	172.25	205.65
NO_X	4.12	8.76	44.93	61.67
PT	0.31	0.67	9.60	12.11
PM_{10}	0.31	0.67	9.60	12.05
$PM_{2.5}$	0.31	0.67	9.60	12.00
SO_2	0.28	2.06	2.08	12.73
VOC**	0.24	0.06	0.27	66.03
Lead	0	3.37E-6	2.19E-5	4.38E-6
Greenhouse Gases (GHGs)				
Carbon Dioxide	21476	11048	75835	152486
Methane	0.33	0.017	0.102	11972.71
Nitrous Oxide	0.039	0.096	0.84	1.39
CO_2 Equivalent (CO_2e)	21496	11077	76088	452217
Hazardous Air Pollutants (HAPs)**				

V-24-016 R1 Emission Summary				
Pollutant	2024 Actual (tpy)	Previous PTE V-24-016 (tpy)	PTE V-24-016 R1 (tpy)	Combined Facility PTE* (tpy)
Hydrochloric Acid	0.44	-	4.10	4.42
Toluene	0.06	0.10	0.20	4.89
Xylenes (Total)	0.01	0.03	0.07	1.73
Combined HAPs:	0.52	0.29	6.77	19.95

*Note: The "Combined Facility PTE" includes both emissions from Big Run Power Producers and Boyd County Landfill. Because they are considered a "single source" their emissions must be counted together. However, the emissions from Big Run Power Producers is not counted toward the combined facility PTE because the worst case scenario is that the emissions routed from Boyd County Landfill are returned to Boyd County Landfill's flare and are already counted as part of its permit.

**Note: Emissions of VOC and most HAPs are controlled by the thermal oxidizer. The permittee must control emissions at all times.

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS

Emission Unit 03 - Renewable Natural Gas Plant & Emission Unit 04 – RNG Plant Back-Up Flare				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
Opacity (EU03)	< 20%	401 KAR 59:010, Section 3(1)(a)	-	Daily qualitative observations and recordkeeping.
PM (EU03)	Process Weight Rate (P): ≤ 0.5 tons/hour: 2.34 lbs/hr ≤ 30 tons/hour: $3.59P^{0.62}$	401 KAR 59:010, Section 3(2)	AP 42 Table 2.4-5 AP 42 Table 1.4-2	Assumed to be in compliance based on the maximum process weight rate and emission factors provided by the application.
Opacity (EU04)	< 20%	401 KAR 63:015, Section 3	-	Daily qualitative observations and recordkeeping.

Initial Construction Date: 2018 for EU03; 2025 for EU04

Process Description:
Emission Unit 03 (EU03) – Renewable Natural Gas (RNG) Plant
The RNG facility receives LFG from Boyd County Landfill's gas collection system. The resulting LFG stream is treated, compressed, and injected into local gas distribution or transmission networks.

Emission Unit 04 (EU04) – RNG Plant Back-Up Flare
Open flare for use when produced gas is off-spec or during RNG plant outage.

Maximum Capacities:
EU03 – RNG Plant: 4,000 scfm LFG
EU04 – Back-Up Flare: 3,600 scfm LFG
Thermal Oxidizer: 2,000 scfm waste gas

Control Devices for EU03: Thermal Oxidizer

Applicable Regulations:
401 KAR 53:010, *Ambient air quality standards*
401 KAR 59:010, *New process operations*, applies to EU03
401 KAR 63:015, *Flares*, applies to EU04
401 KAR 63:002, Section 2(4)(hhh), 40 C.F.R. 63.1930 through 63.1990, Table 1 (Subpart AAAA), *National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills*
40 CFR 63.11, *Control device and work practice requirements*

Emission Unit 03 - Renewable Natural Gas Plant & Emission Unit 04 – RNG Plant Back-Up Flare
Comments: EU03 & EU04 – Emission factors for these units were determined from mass balances, manufacturer guarantees, AP-42 Tables 1.4-1 through 1.4-4 and 40 CFR 98 Tables C-1 and C-2 for fuel usage, and AP-42 Tables 2.4-1, 2.4-2, and 2.4-4 (August 2024) and AP-42, Chapter 13.5 for landfill gas destroyed. For EU04, calculations for the flare are split into two modes. Off-spec mode operates only on off-spec gas at 2000 scfm, 100% by volume methane content. Backup mode has all post-treatment gas routed to flare at 2000 scfm, 10% by volume methane content. Worst case emissions are for off-spec mode, as EU03 still operates in this mode, so backup mode is not counted towards maximum potential. The facility can not currently produce enough gas to operate all controls and processes at their maximum capacity concurrently.

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 last Compliance Testing
03	Thermal Oxidizer	VOC & HAP DE and min. combustion chamber temp.	401 KAR 50:055, Section 2(a)	Initial and every 5 years	TBD	N/A	TBD	TBD	TBD	TBD
03	Thermal Oxidizer	H_2S ppm	401 KAR 50:045, Section 1	Initial	U.S. EPA Method 15/16; ASTM D4084; ASTM D5504; or Approved Alt.	N/A	TBD	TBD	TBD	TBD
03	Thermal Oxidizer	NMOC	40 CFR 63.1959(b)(2)(iii)(B)	Initial	U.S. EPA Method 25 or 25C; Method 3, 3A, or 3C.	98% reduction or 20-ppmv outlet conc.	TBD	TBD	TBD	TBD
04	None	Methane Concentration	40 CFR 63.1959(b)(2)(iii)(A)	Initial	U.S. EPA Method 3C	N/A	TBD	TBD	TBD	TBD

Footnotes:

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:

Emission and Operating Limit	Regulation	Emission Unit
N/A		

Table B - Summary of Applicable Regulations:

Applicable Regulations	Emission Unit
401 KAR 53:010, *Ambient air quality standards,* This regulation contains the primary and secondary ambient air quality standards for sulfur oxides, particulate matter, carbon monoxide, ozone, nitrogen dioxide, lead, hydrogen sulfide, gaseous fluorides, total fluorides, and odors are specified in Appendix A of 401 KAR 53:010.	Site-wide
401 KAR 59:010, *New process operations,* applies to each affected facility, associated with a process operation, which is not subject to another emission standard with respect to particulates.	EU03
401 KAR 63:002, Section 2(4)(hhh), 40 C.F.R. 63.1930 through 63.1990, Table 1 (Subpart AAAA), *National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills,* applies to each municipal solid waste (MSW) landfill that has accepted waste since November 8, 1987 and is a major source or area source with design capacity greater than 2.5 million megagrams and cubic meters, and has uncontrolled emissions equal to or greater than 50 megagrams per year NMOC. Applies to this source because it is located at a MSW landfill as defined in 40 CFR 63.1990.	EU03 & EU04
401 KAR 63:015, *Flares,* applies to each affected facility which means flares as defined in 401 KAR 63:015, Section 2.	EU04
40 CFR 63.11, *Control device and work practice requirements,* applies to control devices (flare) used to comply with applicable subparts of 40 CFR part 63.	EU04

Table C - Summary of Precluded Regulations:

Precluded Regulations	Emission Unit
N/A	

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS (CONTINUED)

Table D - Summary of Non Applicable Regulations:

Non Applicable Regulations	Emission Unit
N/A	

Air Toxic Analysis
N/A

Single Source Determination
Big Run Power Producers, LLC, Source ID #: 21-019-00134 (A.I. #128843), and the adjacent Boyd County Landfill, Source ID #: 21-019-00113 (A.I. #40319), are considered by the Cabinet and the United States Environmental Protection Agency to be a "single source" in determining applicability under 401 KAR 51:017, Prevention of significant deterioration of air quality (PSD) and 401 KAR 52:020, Title V permits. Each source is subject to 401 KAR 52:020 and will be issued individual Title V operating permits. Pursuant to the respective Title V permits, each permittee is responsible and liable for their own violations unless there is a joint cause for the violations.

SECTION 5 – PERMITTING HISTORY

Permit	Permit Type	Activity#	Complete Date	Issuance Date	Summary of Action	PSD/Syn Minor
F-16-052	Initial	APE20160001	6/5/2016	10/2/2016	Initial Construction Permit	Syn Minor
F-16-052 R1	Admin Amend	APE20180001	3/9/2018	3/27/2018	Ownership Change	N/A
F-16-052 R2	Mnr Revision	APE20180003	7/18/2018	7/23/2018	Changes to Selexol Absorber	N/A
F-16-052 R3	Admin Amend	APE20200001	1/7/2021	2/1/2021	Ownership Change	N/A
V-24-016	Renewal /Initial Title V	APE20210003	12/17/2021	1/3/2025	Initial Title V	N/A

SECTION 6 – PERMIT APPLICATION HISTORY

Permit Number: V-24-016 Activities: APE20210003

Received: October 18, 2021 Application Complete Date(s): December 17, 2021

Permit Action: ☒ Initial ☐ Renewal ☐ Significant Rev ☐ Minor Rev ☐ Administrative
Construction/Modification Requested? ☐Yes ☒No NSR Applicable? ☐Yes ☒No

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

Description of Action:
Big Run Power Producers submitted a renewal application for the former conditional major/synthetic minor permit in March 2021. As part of the renewal, BRPP requested that the three emission points that make up the RNG process be combined into one emission unit as they cannot operate independently and are all routed to the same control device for destruction of organic compounds; thus, potential emissions were recalculated based on current industry standards. After discussions with the Division in May 2021, BRPP submitted an initial Title V application in October 2021 for a single source determination with separate permits between BRPP and Boyd County Landfill. BRPP has an interdependency for control of emissions with Boyd County Landfill as off-spec and tail gas may be routed back to the landfill's flare instead of BRPP's thermal oxidizer. However, no construction or other modifications have been made as a result of this application.

No LFG can be vented uncontrolled to the atmosphere.

V-24-016 Emission Summary				
Pollutant	2023 Actual (tpy)	Previous PTE F-16-052 R3 (tpy)	PTE V-24-016 (tpy)	Combined Facility PTE* (tpy)
CO	6.43	22.19	7.36	216.8
NO_X	4.12	4.73	8.76	57.26
PT	0.31	0.36	0.67	12.11
PM_{10}	0.31	0.36	0.67	12.05
$PM_{2.5}$	0.31	0.36	0.67	12.01
SO_2	0.28	0.33	2.06	345.1
VOC**	0.24	32.55	0.06	29.05
Lead	0	0	3.37E-6	5.08E-16
Greenhouse Gases (GHGs)				
Carbon Dioxide	21476	107685	11048	131848
Methane	0.33	85.17	0.017	11973
Nitrous Oxide	0.039	0.04	0.096	1.39
CO_2 Equivalent (CO_2e)	21496	109826	11077	431578
Hazardous Air Pollutants (HAPs)**				
Toluene	0.06	1.48	0.10	3.70
Xylenes (Total)	0.01	0.25	0.03	1.33
Combined HAPs:	0.52	9.38	0.29	16.59

*Note: The “Combined Facility PTE” includes both emissions from Big Run Power Producers and Boyd County Landfill. Because they are considered a “single source” their emissions must be counted together. However, the emissions from Big Run Power Producers is not counted toward the combined facility PTE because the worst case scenario is that the emissions routed from Boyd County Landfill are returned to Boyd County Landfill’s flare and are already counted as part of its permit.
**Note: Emissions of VOC and most HAPs are controlled by the thermal oxidizer. The permittee must control emissions at all times.

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)
LFG – Landfill Gas
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
NSR – New Source Review
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