

**ALLEGHENY COUNTY HEALTH DEPARTMENT
AIR QUALITY PROGRAM**

April 16, 2025

SUBJECT: **Springdale Energy, LLC**
 198 Butler Street Extension
 Springdale, PA 15144

RACT Installation Permit No. 0580-I005
 Installation Permit

TO: JoAnn Truchan, P.E.
 Program Manager, Engineering

FROM: Bernadette Lipari
 Air Quality Engineer

FACILITY DESCRIPTION:

The facility in Springdale Township is a commercial electrical power generation facility. The source is composed of two 48 MWe natural gas and No. 2 fuel oil fired simple cycle combustion turbines (Units 1 and 2) which operate as peaking units and two natural gas-fired, combustion turbines (Units 3 and 4) rated at a nominal 188 MWe (2,094 MMBtu/hr, maximum) each. Units 3 and 4 are operated in combined cycle mode through two heat recovery steam generators (HRSGs) without duct burners, one per unit, with an additional 186 MWe generated by an axial flow steam turbine which utilizes the steam produced by the HRSGs. The combined cycle combustion turbines fire natural gas exclusively and are equipped with dry low-NO_x burners and selective catalytic reduction (SCR) for control of NO_x emissions. The simple cycle combustion turbines fire natural gas and No. 2 fuel oil exclusively and are equipped with water injection for NO_x control and use low sulfur (0.0015% max.) fuel oil for SO₂ control. The steam turbine generator uses steam from the heat recovery steam generators and has no fuel supply and no emissions. Additional emission units consist of one 148,690 gallon per minute cooling tower, a 24,800-gallon aqueous ammonia storage tank, a 400,000-gallon No. 2 fuel storage tank, and two 1,250 kW emergency generators, and an emergency fire pump.

The facility is a major source of particulate matter (PM) and particulate matter < 10 microns in diameter (PM₁₀), nitrogen oxides (NO_x), carbon monoxide (CO) and volatile organic compounds (VOC) and a minor source of sulfur dioxide (SO₂) and hazardous air pollutants (HAPs) as defined in section 2101.20 of Article XXI.

INSTALLATION PERMIT DESCRIPTION:

This permit replaces installation permit #0580-I001 and installation permit #0580-I002a, as well as RACT installation permit #0580-I003 and incorporates changes to the requirements for simple cycle turbines Units 1 and 2 (AE1 and AE2) and the requirements for combined cycle turbines Units 3 and 4 (AE3 and AE4). This permit also incorporates the requirements for case-by-case RACT III (2015 Ozone RACT).

Changes to the requirements for turbines AE1 and AE2 include:

1. Clarifying the 424 MMBtu/hr combustion turbine rating to represent a nominal rating,

2. Eliminating the 4,450 hours per year operating restriction due to the use of Part 75-required NO_x CEMS,
3. Change the short-term NO_x limit averaging period from a 3-hour to 4-hour average to harmonize with NSPS GG,
4. Establishing alternate short-term limits and work practice standards limiting emissions during periods of startup, shutdown, tuning, blackstart testing, and NERC reliability testing,
5. Eliminating biennial NO_x source testing due to Part 75 NO_x CEMS, and
6. Clarifying the USEPA Test Methods to evaluate PM and PM₁₀ compliance.

Changes to the requirements for turbines AE3 and AE4 include:

1. Correct the aqueous ammonia storage tank (T-2) capacity rating to 24,800 gallons,
2. Change the short-term NO_x limit averaging period from a 3-hour to 4-hour average to harmonize with NSPS GG,
3. Clarify the timing of low-load turndown NO_x and CO limits only after completion of a full startup sequence and established normal operation,
4. Establishing alternate short-term emission limits during periods of tuning and NERC reliability testing to the startup and shutdown exemption,
5. Clarify the USEPA test methods for particulate matter limits and testing.

PERMIT APPLICATION COMPONENTS:

1. Major Source Operating Permit administrative amendment application package requesting the above noted changes to simple cycle combustion turbines AE1 and AE2 and combined cycle turbines AE3 and AE4, dated January 13, 2022.
2. Installation Permit #0580-I001, issued September 30, 1999.
3. Installation Permit #0580-I002a, issued July 12, 2001, amended June 6, 2002.
4. RACT Installation Permit #0580-I003, issued October 13, 2016.

EMISSION SOURCES:

Table 1: Emissions Sources

I.D.	SOURCE DESCRIPTION	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
AE1	General Electric LM6000PC Simple Cycle Combustion Turbine	Water Injection	424 MMBtu/Hr (nominal)	Natural gas No. 2 fuel oil	S001
AE2	General Electric LM6000PC Simple Cycle Combustion Turbine	Water Injection	424 MMBtu/Hr (nominal)	Natural gas No. 2 fuel oil	S002
AE3	Siemens Westinghouse Model 501F	Dry Low/NO _x Burners /SCR	2,094 MMBtu/Hr	Natural Gas	S003
AE4	Siemens Westinghouse Model 501F	Dry Low/NO _x Burners /SCR	2,094 MMBtu/Hr	Natural Gas	S003
AE5	Steam Turbine Electric Generator	None	186 MW	n/a	n/a
T-2	Aqueous Ammonia Storage Tank	Vapor Balancing and Bottom Loading	24,800 gallons	Aqueous Ammonia	n/a
CT-2	Cooling Tower	Mist eliminators	148,690 gallons/minute	n/a	S004

I.D.	SOURCE DESCRIPTION	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
G-02	Emergency Fire Pump Engine	None	265 BHP	Diesel	n/a

EMISSION CALCULATIONS:

Detailed emissions calculations can be found in Appendix A.

Unit Descriptions (each combustion turbine):

Unit: Simple cycle combustion turbines
I.D.(s): Unit No. 1 & Unit No. 2
Make: General Electric
Model: LM 6000PC
Fuel: Natural gas & No. 2 fuel oil
Sulfur content: 0.0015% maximum by weight

Note: Article XXI, §2104.10.a.1 allows for use of any 0.05% sulfur fuel purchased by the facility before September 1, 2020, so PTE calculations are based on 0.05% sulfur. Any new purchases of fuel oil must be 0.0015% or less.

Rating: 48 MWe – 355×10^6 Btu/hr normal, 424.4×10^6 Btu/hr maximum at HHV
Controls: Water injection for NO_x control, low sulfur (0.0015% max.) fuel oil for SO₂ control
Instrumentation: CEMS for NO_x, O₂ and fuel flow

Unit: Combined cycle combustion turbine
I.D.(s): Unit No. 3 & Unit No. 4
Make: Siemens-Westinghouse
Model: 501F
Fuel: Natural gas only
Rating: 209 MWe (net) - $1,884 \times 10^6$ btu/hr normal, $2,094 \times 10^6$ Btu/hr maximum at HHV
Exhaust: Heat recovery steam generator (without duct burners) each unit.
Controls: Dry Low-NO_x burners with SCR
Instrumentation: CEMS for fuel flow, exhaust gas flow, nitrogen oxides, oxygen and carbon monoxide

Unit: Steam turbine generator (w/o duct burners)
I.D.(s): Unit No. 5
Fuel: NA
Rating: 186 MWe due to steam from the two heat recovery steam generators

Cooling tower

Process Description: One multi-cell evaporative cooling tower
No. of cells: Six with identical fan stacks
Facility ID: CT-2
Coolant: Water
Control Device(s): Mist eliminators (limit drift to 0.0005% of circulating water flow)
Capacity: 148,690 gallon per minute
Max. TDS: 3,000 ppm

Ammonia tank

Process Description: One 24,800-gallon storage tank
Facility ID: T-2
Contents: Aqueous Ammonia 29.5%
Control Device(s): Vapor Balancing and Bottom Loading

ALLOWABLE EMISSION SUMMARY:

Simple Cycle Combustion Turbine (Unit 1 or Unit 2) - each:

Pollutant	Each Unit lbs/hr Natural gas	ppm _{vd} Natural Gas	Each Unit lbs/hr Fuel oil	ppm _{vd} Fuel oil	Combined tons/yr ¹	Basis
PM	6.6		17.0		17	Article XXI
PM ₁₀	6.6		17.0		17	Article XXI
NO _x	41.0	25	71.0	42	98	Mfg. Data
CO	57.0		6.0		115	Mfg. Data
SO _x	0.3		22.5		6	AP-42+20%
VOC	5.0	2.8	1.0	0.6	10	Mfg. Data
Formaldehyde	1.4				3.3	AP-42+20%

¹ A year is defined as any consecutive 12-month period. Annual emissions include emissions during startup and shutdown.

Combined Cycle Combustion Turbine (Unit 3 and Unit 4) - each:

Pollutant	lbs/mmbtu	ppm _{vd}	Each Unit lbs/hr	Combined tons/yr ¹	Basis
PM	0.015		19.0	166	PSD BACT
PM ₁₀	0.015		19.0	166	PSD BACT
NO _x		2.5 ²	20.0 ³	210 ⁴	RACT I
CO		10.0 ²	48.0	550	PSD BACT
SO _x	0.00286		5.7	53	PSD BACT
VOC		2.0 ²	3.8	48	Article XXI BACT
Formaldehyde			0.68	5.7	AP-42+20%
Sulfuric Acid Mist			0.685	6.0	PSD BACT
Ammonia		10.0 ²	28.0	245	Vendor Specs

¹ A year is defined as any consecutive 12-month period. Annual emissions include emissions during startup and shutdown.

² @15% O₂ during any 4-hour time period at or above 70% of full load for NO_x and any 1-hour time at or above 70% of full load for CO and VOC.

³ Based on a rolling 4-hour average.

⁴ The short-term limit of 20 lbs/hr effectively limits NO_x emissions to 87.6 tpy for each turbine, or 175.2 tpy total. See condition V.B.1.j of Installation Permit #0580-I005. However, these restrictions do not take into account startup and shutdown emissions. All NO_x emissions are monitor by CEMs.

Cooling Tower:

Pollutant	tons/yr ¹	Basis
PM	4.9	TVOP 0580 application
PM ₁₀	4.9	TVOP 0580 application

¹ A year is defined as any consecutive 12-month period.

EMISSION CONTROL:

The two simple cycle combustion turbine Units 1 & 2 are equipped with water injection for control of nitrogen oxides and fire natural gas or low sulfur No. 2 fuel oil (0.0015% maximum sulfur) for control of sulfur oxide emissions. The two combined cycle combustion turbine Units 3 & 4 are equipped with dry low-NO_x burners and selective catalytic reduction for control of nitrogen oxides control, which is considered LAER/BACT for NO_x, and they combust pipeline quality natural gas only. The cooling tower is equipped with mist eliminators for control of particulates and the ammonia tank uses vapor balance for emission control.

TESTING REQUIREMENTS:

NO_x emissions are monitored continuously with a CEM on each of the four units. These CEMs must meet the requirements of §2108.03 and 40 CFR Part 75.

Units No. 1 & No. 2

Emission testing is performed for NO_x and CO emissions on each of the simple cycle turbines every two years in accordance with Article §2108.02.c. The NO_x emission testing requirements may be satisfied by the NO_x relative accuracy testing for CEMS systems conducted in accordance with the requirements of 40 CFR Part 75 and the performance test required under §60.8 or the CEMs requirements in 40 CFR Part 75. Testing for NO_x is performed at each of the following load conditions.

48 MW (100%)

36 MW (75%)

24 MW (50%)

14 MW (30%) or;

At four points in the normal operating range of the gas turbine including the minimum point in the range and peak load.

Testing at the above load points may be waived by the Department if the installed NO_x CEMS is tested.

Method 20 or any other method acceptable to and approved by the Department shall be used to determine the nitrogen oxides, oxygen concentrations and sulfur dioxide concentration.

The permittee shall determine compliance with the sulfur content of each fuel being fired using ASTM D 2880-71.

Units No. 3 & No. 4

Emissions testing is performed on the combined cycle turbines once every three years for volatile organic compounds, formaldehyde, particulate matter, PM₁₀ and PM_{2.5} and annually to demonstrate compliance with the ammonia emissions limitation of 10 ppm and the corresponding ammonia emission limits in lbs/hr and tons/yr in the permit.

METHOD OF DEMONSTRATING COMPLIANCE:

Continuing compliance with the emission limitations of this permit will be reasonably assured by continuous fuel flow monitors on all units, CEMs for NO_x on all units, CEMS for CO on Units No. 3 & No. 4, the use of natural gas or low sulfur fuel oil in Units No. 1 & No. 2, the use of natural gas only in Units No. 3 & No. 4, and SCR system monitoring in Units No. 3 & No. 4, along with associated recordkeeping and reporting requirements.

In addition to maintaining and operating Units No. 1 & No. 2 in accordance with the manufacturer's specifications and with good operating practices, NO_x CEMS will continuously monitor NO_x emissions to ensure that short term limits are not exceeded during SU/SD/NERC events. VOC emissions shall also be limited to 1.32 lb/event for natural gas and to 7.59 lb/event for fuel oil during SU/SD/NERC events. In addition to maintaining and operating Units 3 and 4 in accordance with the manufacturer's specifications and with good operating practices, NO_x CEMS will continuously monitor NO_x emissions to ensure that short term limits are not exceeded during SU/SD/NERC events. VOC emissions shall also be limited to 293 lb/cold startup, 156 lb/warm startup, and 145 lb/hot startup for natural gas during SU/SD/NERC events.

REGULATORY APPLICABILITY:

1. Article XXI Requirements for Issuance:

The requirements of Article XXI, Parts B and C for the issuance of major source operating permits have been met for this facility. Article XXI, Part D, Part E & Part H will have the necessary sections addressed individually.

2. Testing Requirements:

Units No. 1 & No. 2

Emissions testing shall be performed for NO_x and CO emissions for turbine Units No. 1 & No. 2 every two years in accordance with Article XXI §2108.02.e. U.S. EPA Method 10 shall be used for CO testing. In order to demonstrate compliance with the CO emissions limitations, testing shall be performed while combusting each fuel (natural gas and No. 2 fuel oil) separately. Fuel oil shall be tested to determine the maximum fuel bound nitrogen content on each of the turbines every two years in accordance with Article §2108.02.c. Continuous fuel flow monitors shall be installed and maintained on each unit in accordance with 40 CFR Part 75 Appendix D Chapter 2.1.

Emissions of NO_x may be determined by the CEMs required in §60.334(b) in lieu of a stack test to determine compliance with the emissions limitation of §2105.06.b.4. NO_x emission testing requirements may be satisfied by the NO_x relative accuracy testing for CEMS systems conducted in accordance with the requirements of 40 CFR Part 75 and the performance test required under §60.8 or the alternative manner described in 40 CFR §60.335(b)(7).

Units No. 3 & No. 4

Compliance with the nitrogen oxides and sulfur dioxide standards in §60.332 and §60.333(a) to determine the nitrogen oxides, sulfur dioxide, and oxygen concentrations. U.S. EPA Method 20 will be used to determine nitrogen oxides. Continuous fuel flow monitors shall be installed and maintained on each unit in accordance with 40 CFR Part 75 Appendix D Chapter 2.1.

The permittee shall install, operate and maintain continuous emission monitors for nitrogen oxides, oxygen and carbon monoxide on Units 3 & 4. Such monitoring systems shall meet the requirements of §60.334 and 40 CFR Part 75.

The permittee shall perform particulate matter (PM), PM₁₀ and PM_{2.5} emissions testing once every three years. Such testing shall be conducted in accordance with U.S. EPA test methods 5, 201A, and 202 or other method as approved by the Department and Article XXI §2108.02. Particulate matter emissions testing shall be for filterable and condensable particulate matter. Compliance may be determined using the front-half catch of Method 5.

Emissions testing in accordance with Article XXI, §2108.02.d. and e. shall be performed once every three years for volatile organic compounds by EPA Methods 18 & 25 and for formaldehyde by EPA Method 323.

Emissions testing shall be performed annually to demonstrate compliance with the ammonia emissions limitation of 10 ppm and the corresponding ammonia emission limits in accordance with Article XXI, §2108.02.d. and e.

3. **New Source Review/Prevention of Significant Deterioration (NSR/PSD):**

NSR and PSD do not apply because there are no increases to the potential emissions in this permit.

4. **New Source Performance Standards (NSPS):**

40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines:

This subpart is applicable to all four units due to each unit having a heat input greater than 10 MMBtu/hr and construction date after October 3, 1977. When installation permits 0580-I001 (issued 9/30/99) and 0580-I002a (issued 6/6/02) were issued, the NSPS had not been promulgated, so those conditions (including those requiring a NO_x CEM) were not included.

In accordance with the NSPS, the units are required to comply with the following NO_x/SO_x emission limits of §60.332(a)(1) & SO₂ emission limits of §60.333(a).

Units No. 1 & No. 2 each

NO_x = 115 ppm_{dv}

SO₂ = 150 ppm_{dv}

Units No. 3 & No. 4 each

NO_x = 109 ppm_{dv}

SO₂ = 150 ppm_{dv}

However, the existing Installation Permit conditions require emissions that are significantly lower (i.e., 25 ppm NO_x for Units No. 1 & No. 2; 2.5 ppm NO_x for Units No. 3 & No. 4). Those limits are retained in this installation permit.

Units No. 1 & No. 2 each must either continuously monitor the fuel flow rate and the ratio of water to fuel or operate in accordance with the revised NSPS (July 8, 2004) or the alternate monitoring plan approved by EPA Region III on September 11, 2002 (Units No. 1 & No. 2) and on June 20, 2003 (Units No. 3 & No. 4).

All units must report excess emissions of NO_x & SO₂.

In accordance with the NSPS, the NO_x emission testing requirements for Units No. 3 & No. 4 may be satisfied by the NO_x relative accuracy testing for CEMS systems conducted in accordance with the requirements of 40 CFR Part 75 and the performance test required under §60.8.

40 CFR 60, Subpart IIII (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines – CI RICE): This rule is not applicable to the emergency fire pump engine G-02 because the unit was installed before the applicability date of the regulation, July 11, 2005.

5. **Continuous Emission Monitoring (40 CFR Part 75):**

The NO_x emission testing requirements may be satisfied by the NO_x relative accuracy testing for CEMS systems conducted in accordance with the requirements of 40 CFR Part 75 for all units. Continuous fuel flow monitors shall be installed and maintained on each unit in accordance with 40 CFR Part 75 Appendix D Chapter 2.1.

6. **NESHAP and MACT Standards:**

40 CFR Part 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines: This rule is not applicable to the emergency fire pump engine G-02. The generators meet the operational requirements of “emergency stationary RICE” under §63.6640(f), and

therefore are not subject to this subpart per §63.6585(f).

7. **Risk Management Plan; CAA Section 112(r):**

The facility is subject to §112(r) of the Clean Air Act due to the storage of aqueous ammonia (29.5% concentration). There is a risk management plan in place at the facility.

8. **Greenhouse Gases (40 CFR Part 98):**

There are presently no Title V applicable requirements for greenhouse gases. Should the facility exceed 25,000 metric tons of CO₂e in any 12-month period, the facility would be required to submit reports in accordance with 40 CFR Part 98.

9. **Emissions Inventory:**

This facility is required to provide annual Emission Inventory reports per §2108.01.e of Article XXI because this facility has the potential to emit a total of twenty-five (25) or more tons of PM₁₀, NO_x, CO, SO_x, and VOC.

10. **Acid Rain Program, 40 CFRs 72 Through 78:**

Units No. 1, No. 2, No. 3 and No. 4 are affected units as per §72.6 of 40 CFR Part 72. These units are subject to all applicable conditions of parts 72 through 78 specifically monitoring, recordkeeping and reporting requirements. The units Phase II Acid Rain Permits are incorporated by reference into the Title V Operating Permit.

11. **Cross-State Air Pollution Rule (CSAPR) (40 CFR Part 97 Subparts AAAAA, CCCCC, and GGGGG):**

The permittee shall comply with all requirements of 40 CFR Part 97 (relating to Cross-State Air Pollution Rule (CSAPR) NO_x Budget Trading and SO₂ Trading Programs). The permittee is subject to the standard requirements of 40 CFR §97.406, 40 CFR §97.606 and 40 CFR §97.1006. This program has replaced the EPA's Clean Air Interstate Rule (CAIR) and the requirements of 25 Pa Code §§145.203, 145.204, 145.205, 145.212, 145.213, 145.221, 145.222, and 145.223.

12. **Best Available Control Technology (BACT):**

This installation permit replaces existing installation permits #0580-I001 and #0580-I002a, and is therefore for existing equipment. Since there are no operational changes, BACT does not apply. This permit is also being issued to meet the requirements of the 2015 Ozone RACT (RACT III). The Department considers the existing controls and limitations to be RACT for this facility.

EMISSIONS SUMMARY:

Combined Emissions:

Pollutant	Combined tons/yr ¹
PM	187.5
PM ₁₀	187.5
NO _x	309
CO	665
SO _x	59
VOC	58
Formaldehyde	9
Sulfuric Acid Mist	6
Ammonia	246

¹ A year is defined as any consecutive 12-month period.
Annual emissions include emissions during startup and shutdown.

RECOMMENDATIONS:

All applicable Federal, State, and County regulations have been addressed in the permit application. The facility is not subject to the restrictions of §2102.04.k of Article XXI because there have been no Notices of Violation issued for this facility during the last 18 months. The Title V Operating Permit renewal for Springdale Energy, LLC should be approved with the emission limitations, terms and conditions in Permit No. 0580-I005.

APPENDIX A – EMISSIONS CALCULATIONS

See attached spreadsheet.

APPENDIX B – ACID RAIN PERMIT