I. FACILITY INFORMATION

Cumberland Energy Center is located at 4001 East Main St., Millville, NJ 08332 (Cumberland County). The facility is an electric generating facility with a generating capacity of 199 MW. The facility is owned and operated by Calpine New Jersey Generation, LLC.

The facility is classified as a major facility based on its potential to emit 174 tons per year of Nitrogen Oxides (NOx), 198 tons per year (tpy) of Carbon Monoxide (CO), 36.1 tons per year of Volatile Organic Compounds (VOC).

This permit allows individual hazardous air pollutants to be emitted at a rate to not exceed: 138 lb/yr of Acrolein, 71.6 lb/yr of Arsenic, 358 lb/yr of Benzene, 127 lb/yr of Butadiene (1, 3-), 31.2 lb/yr of Cadmium, 6,060 lb/yr of Formaldehyde, 91.0 lb/yr of Lead, 5,140 lb/yr of Manganese, 6.00 lb/yr of Mercury and 163 lb/yr of Selenium.

II. AREA ATTAINMENT CLASSIFICATION

The Federal Clean Air Act (CAA) sets National Ambient Air Quality Standards (NAAQS) for six common air pollutants. These commonly found air pollutants (also known as "criteria pollutants") are particulate matter, ground-level ozone, carbon monoxide (CO), sulfur dioxide (SO2), nitrogen dioxide (NO2), and lead. The US Environmental Protection Agency (USEPA) also classifies areas as “attainment” or “nonattainment” for each criteria pollutant, based on the magnitude of an area's problem. Nonattainment classifications are used to specify what air pollution reduction measures an area must adopt, and when the area must reach attainment. Currently, the entire State of New Jersey is designated as nonattainment for the 8-hour ozone NAAQS. New Jersey is designated attainment for all other pollutants. For nonattainment classification refer to https://www.epa.gov/green-book/green-book-national-area-and-county-level-multi-pollutant-information.

III. BACKGROUND AND HISTORY

The equipment that emits air contaminants from this facility include:

1) (1) 96 MW natural gas (NG) or ultra-low sulfur distillate oil (ULSD) fired simple cycle electric generating turbine with water injection to control NOx emissions;
2) (1) 103 MW NG or ULSD fired simple cycle electric generating turbine with water injection and selective catalytic reduction (SCR) to control NOx emissions and an oxidation catalyst to control CO and VOC emissions. The minimum control efficiency of SCR, with respect to NOx, is 90%, and the minimum control efficiency of the oxidation catalyst, with respect to CO, is 90%;
3) (1) 13.6 MMBtu/hr NG fired natural gas compressor engine with non-selective catalytic reduction to control NOx emissions;
4) (1) 2500 KW emergency diesel fired generator; and
5) (1) sand blasting unit with a baghouse to control particulate emissions.

A Facility-Wide Risk Assessment will be conducted during the next Operating Permit Renewal process. Health Risk Assessment was not conducted with this permit modification, since no changes were made to Air Toxics (including HAPs) emissions.

This is a Permit Modification and includes the following changes:

1) Change the upper limit of the SCR catalyst temperature to be consistent throughout the permit and equal to the vendor's specification sheet (870 F).
    - Change temperature at exit of catalyst (U4, OSS, REF #22) from 800 to 870 degrees F.
    - Change CD3 details (maximum temperature at catalyst bed) and (maximum temperature at reagent injection point) from 840 to 870 degrees F.
    - Change CD4 details (maximum inlet temperature) and (maximum outlet temperature) from 840 to 870 degrees F.
    - Change PT4 maximum exhaust temperature in emission point inventory from 836 to 870 degrees F.

- Change U4, OS1 maximum temperature in emission unit inventory from 836 to 870 degrees F.
- Change U4, OS3 maximum temperature in emission unit inventory from 821 to 870 degrees F.

2) Change ammonia (NH3) monitoring requirement from "continuous process monitor" to "continuous monitoring by ammonia flow metering device". Update the following permit conditions to represent this change:
   - U4, OSS, REF #9 and REF #30
   - U4, OS1, REF #26
   - U4, OS3, REF #21
3) Incorporate Acid Rain Permit into the operating permit.

There are no proposed changes to air contaminant allowable emission rates or allowable fuel usage rates.

IV. CASE-BY-CASE DETERMINATIONS

No case-by-case determinations were required for this modification.

V. EMISSION OFFSET REQUIREMENTS

This modification is not subject to Emission Offset requirements.

VI. BASIS FOR MONITORING AND RECORDKEEPING REQUIREMENTS

The facility's operating permit includes monitoring, recordkeeping and reporting requirements that are sufficient to demonstrate the facility's continued compliance with the applicable requirements consistent with the following:

1. Provisions to implement the testing and monitoring requirements of N.J.A.C. 7:27-22.18, the recordkeeping and reporting requirements of N.J.A.C. 7:27-22.19, and all emissions monitoring and analysis procedures or compliance assurance methods required under the applicable requirements, including any procedures and methods promulgated pursuant to 40 CFR 64; and

2. Where the applicable requirement does not require direct periodic monitoring of emissions, the Department requires periodic monitoring of surrogate parameters sufficient to yield reliable data from the relevant time period that are representative of the facility's compliance with the permit.
   - U4 (Turbine)
     - The facility monitors the fuel consumed by the turbine, the total hours of turbine operation while combusting each fuel and number of startups and shutdowns. This information is a surrogate for the long-term (tons/year) emissions limits for VOC, SO2, TSP, PM-10, and individual HAPs.
     - The facility continuously monitors the rate of fuel combustion, the NOx emissions and other parameters which are then used by the ammonia injection control system to calculate the ammonia injection rate that is necessary to maintain the Ammonia slip emission rates within permit limits. This is therefore a surrogate for emissions of Ammonia slip.
     - The facility monitors the hourly heat input as a surrogate for the short-term (lb/hr) emissions for VOC, SO2, TSP and HAPs.
     - The facility monitors the water injection rate (for the water injection system) as a surrogate for the short-term (lb/hr) NOx emissions.
     - The facility performs a combustion process adjustment as a surrogate for the short-term (lb/hr) NOx and CO emissions.
     - The facility ensures that any fuel oil combusted by the turbine complies with the permitted fuel sulfur content limit as a surrogate for the short-term (lb/hr) SO2 emissions.
   - CD3 (Selective Catalytic Reduction (SCR)):

- The temperature upstream of the SCR is monitored in order to verify that the SCR is operating properly and is used as a surrogate for the emission limits for NOx, during all steady state operation of the turbine.

- CD4 (Oxidation Catalyst):
  - The temperature at the exit of the catalyst is monitored in order to verify that the oxidation catalyst is operating properly and is used as a surrogate for the emission limits for CO and VOC, during all steady state operation of the turbine.

3. In some cases, direct periodic monitoring of emissions and/or surrogate parameters is not required due to one or more of the following:

- Equipment size and capacity limitations,
- Subject equipment being permitted at the maximum rated capacity,
- There is no specific state or Federal standard that applies to this piece of equipment,
- Not a pollutant of concern for this piece of equipment,
- Agreements with EPA on the frequency of testing and monitoring for combustion sources.

Based on the above criteria, there is no direct or surrogate monitoring for the following pieces of equipment:

- U4 (Turbine):
  - Opacity is not monitored while combusting natural gas.

VII. APPLICABLE STATE AND FEDERAL RULES

This modification is subject to New Jersey Air Pollution Control Regulations, codified in N.J.A.C. 7:27-1 through 34, as applicable. A complete text of these regulations is available at: http://www.nj.gov/dep/aqm/rules27.html

This modification is also subject to Federal regulations listed below.

40 CFR 60 Subpart A	New Source Performance Standards (NSPS): General Provisions
40 CFR 60 Subpart GG	New Source Performance Standards (NSPS): Standards of Performance for Stationary Gas Turbines
40 CFR 60 Subpart KKKK	New Source Performance Standards (NSPS): Standards of Performance for Stationary Combustion Turbines
40 CFR 60 Subpart IIII	New Source Performance Standards (NSPS): Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.
40 CFR 63 Subpart ZZZZ	National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines.
40 CFR 72 – Acid Rain	Acid Rain Program
40 CFR 97 – CSAPR	Cross State Air Pollution Rule

The Greenhouse Gas (GHG) emissions from this facility are 524,000 TPY CO2e and there is no GHG emissions increase. This modification is not subject to PSD rules at 40 CFR 52.21.

VIII. FACILITY'S COMPLIANCE STATUS

The Responsible Official at the facility has certified that the facility currently meets all applicable requirements of the Federal Clean Air Act and the New Jersey Air Pollution Control Act. Based on this certification, the Department's evaluation of the information included in the facility's application, and a review of the facility's compliance status, the Department has concluded that this air pollution control operating permit should be approved.

This operating permit includes a permit shield, pursuant to the provisions of N.J.A.C. 7:27-22.17. A permit shield provides that compliance with the relevant conditions of the operating permit shall be deemed

compliance with the specific applicable requirements that are in effect on the date of issuance of the draft operating permit, and which form the basis for the conditions in the operating permit.

Prior to the expiration of the Operating Permit's five-year term, the facility will be required to apply for a renewal, at which time the Department will evaluate the facility and issue a public notice with its findings.

IX. EXEMPT ACTIVITIES

The facility's operating permit does not include exempt activities such as office and interior maintenance activities, maintenance shop activities, food preparation facilities, cafeterias and dining rooms, etc. A complete list of exempt activities, as allowed by the Operating Permit rule, can be found at N.J.A.C. 7:27-22.1.

FACILITY NAME (FACILITY ID NUMBER)
BOP050001

Activity Number assigned by the Department

New Jersey Department of Environmental Protection
Facility Specific Requirements

Emission Unit Number assigned by the Facility

Brief description of emission unit

Emission Unit: **U40 Sewage Sludge Incinerators**
Operating Scenario: **OS Summary** **OR** **OS2 Fluidized Bed Incinerator**

OS Summary lists all rules and requirements that apply to an emission unit. An emission unit may contain one or more pieces of equipment and corresponding operating scenarios.

OSX denotes the operating scenario number and lists the rules and requirements that apply to a scenario. An operating scenario represents various ways (or scenarios) a piece of equipment is permitted to operate.

Item Number

Description of applicable requirement

Monitoring method to ensure compliance

Recordkeeping to show facility's compliance

Actions and submittals required for the facility

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
3	The permittee shall conduct an annual performance test for each pollutant in Table 2 of 40CFR62 Subpart LLL between 11 and 13 calendar months after the previous performance test or within 60 days of a process change. [40 CFR 62.16000(a)]	Other: Conduct the performance test using the test methods, averaging methods and minimum sampling volumes or durations as specified in 40CFR62 Subpart LLL and according to the testing, monitoring and calibration requirements specified in 40 CFR 62.16015(a). [40 CFR 62.16000(a)].	Other: (1) Maintain records of the results of initial, annual and any subsequent performance tests conducted to determine compliance with the emission limits and standards and/or to establish operating limits, as applicable. [40 CFR 62.16025(e)].	Submit a report: Annually to the Administrator and to the Department. The permittee shall submit an annual compliance report as specified in 40 CFR 62. [40 CFR 62.16000(d)]

Rule citation for applicable requirement

Rule citation for monitoring requirement

Rule citation for recordkeeping requirement

Rule citation for submittal/ action requirement

Explanation Sheet for Facility Specific Requirements