

STATEMENT OF BASIS for TRUSTEES OF PRINCETON UNIVERSITY

TITLE V OPERATING PERMIT RENEWAL

Program Interest (PI): 61014 / Permit Activity Number: BOP180001

I. FACILITY INFORMATION

Trustees of Princeton University is located in Mercer County at the Macmillan Building, Elm Drive, Princeton, NJ 08543 and consists of boilers, emergency generators, a cogeneration plant, a spray booth and a gasoline storage tank. The facility is owned by Trustees of Princeton University and is operated by Trustees of Princeton University.

The facility is classified as a major facility based on its potential to emit 136 tons per year of carbon monoxide (CO), 146 tons per year of oxides of nitrogen (NOx) and 46 tons per year of volatile organic compounds (VOC).

This permit allows individual hazardous air pollutants to be emitted at a rate not to exceed: 2.03 pounds per year of acrolein, 3.09 pounds per year of arsenic, 4.5 pounds per year of benzene, 0.51 pounds per year of beryllium, 2.76 pounds per year of cadmium, 0.09 pounds per year of cobalt, 0.02 pounds per year of dimethylbenz(a)anthracene(7,12-), 306.11 pounds per year of formaldehyde, 2.91 pounds per year of lead, 165.03 pounds per year of manganese, 1.82 pounds per year of naphthalene, 3.17 pounds per year of nickel and 5.59 pounds per year of polynuclear aromatic hydrocarbons.

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: Ten natural gas fired boilers ranging in size from 1 to 2.4 mmBtu/hr, a gasoline dispensing facility limited to <= 150,000 gal/year, and equipped with a Stage I Vapor Recovery System (VRS) with a control efficiency >= 98%, twenty three diesel fired emergency generators ranging in size from 1 to 18 mmBtu/hr, two 189 mmBtu/hr natural gas (NG) or No.2 fuel oil (FO) fired boilers, equipped with low NOx burners and flue gas recirculation, a furniture spray booth equipped with particulate filters, a 174 mmBtu/hr NG or FO fired combustion turbine equipped with a catalytic oxidizer and a water injection system, and a 151 mmBtu/hr NG fired duct burner equipped with low NOx burners.

This permit also incorporates four general operating permits (Activity #'s BOP170002, BOP170001, BOP160001 and BOP150001) that the facility obtained for emergency diesel generators with heat input rates of 1.64, 17.98, 10.07 and 7.5 MMBTU/hr (HHV), respectively. These generators are permitted to operate up to 100 hours per year on fuel oil for testing and maintenance. The total increase in facility emissions due to the addition of this new generator is 3.33 tons of NOx, 0.06 tons of VOC and 300 tons of CO₂(e) per year.

No changes were made to the operating permit through seven-day notice changes, administrative amendments, minor modifications, or significant modifications since the approval of the initial operating permit or the most recent renewal thereof. Please refer to the attached explanation sheet for the structure and configuration of conditions of approval, included in the Facility Specific Requirements section of this permit.

A Facility-Wide Risk Assessment was conducted as part of the review of this permit application and health risk was determined to be negligible consistent with NJDEP Technical Manual 1003.

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This is a Permit Renewal which includes the following changes:

PM2.5 emissions added;
HAP emissions updated per N.J.A.C. 7:27-17.9 Table 2 thresholds;
No.2 fuel oil sulfur specifications updated;
Emission unit U14 deleted;
Emergency generator removed - OS8 of U29 deleted;
Four emergency generators added - OS22 through OS25 added to U29;
Stack test results to be based upon "the average of three tests" rather than "each of three tests";
Applicable Federal Rules mentioned in the Operating Summary;
Miscellaneous inconsistencies addressed.

The changes made during this permitting action result in allowable annual emissions changes as follows: 2.03 pounds per year of acrolein, 3.09 pounds per year of arsenic, 4.5 pounds per year of benzene, 0.51 pounds per year of beryllium, 2.76 pounds per year of cadmium, 0.09 pounds per year of cobalt, 0.02 pounds per year of dimethylbenz(a)anthracene(7,12-), 306.11 pounds per year of formaldehyde, 2.91 pounds per year of lead, 165.03 pounds per year of manganese, 1.82 pounds per year of naphthalene, 3.17 pounds per year of nickel and 5.59 pounds per year of polynuclear aromatic hydrocarbons.

IV. 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.

For surface coating operation U17, the facility monitors the coating usage (gal/yr) and VOC and HAP content (lb/gal) of all surface coating formulations as surrogates for the long-term (TPY) emission limits for VOC and HAPs. For each surface coating formulation, the facility monitors the coating usage (gal/hr), VOC content and HAP content as surrogates for the short-term (lb/hr) emission limits for VOC and HAPs.

For the combustion turbine in U18, the facility monitors the fuel use as the surrogate for the long-term (TPY) emissions limits for VOC, NO_x, CO, SO₂, TSP, PM-10 and PM-2.5.

For the boilers in U18, the facility monitors fuel use as the surrogate for the long-term (TPY) emission limits for VOC, NO_x, CO, SO₂, TSP, PM-10 and PM-2.5.

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.

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

- E2 (U2/OS1) 1.01 mmBtu/hr boiler
- E3 (U2/OS2) 1.01 mmBtu/hr boiler
- E4 (U3/OS1) 2.1 mmBtu/hr boiler
- E5 (U3/OS2) 2.1 mmBtu/hr boiler
- E43 (U4/OS1) 2.4 mmBtu/hr boiler
- E48 (U4/OS2) 2.4 mmBtu/hr boiler
- E49 (U5/OS1) 1.43 mmBtu/hr boiler
- E50 (U5/OS2) 1.43 mmBtu/hr boiler
- E51 (U5/OS3) 1.43 mmBtu/hr boiler
- E44 (U5/OS4) 1.43 mmBtu/hr boiler.

V. APPLICABLE STATE AND FEDERAL RULES

The facility 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>

The facility is also subject to Federal Regulations listed below.

- 40 CFR 63 Subpart A: General Provisions.
- 40 CFR 63 Subpart CCCC: Gasoline-Dispensing Facilities.
- 40 CFR 63 Subpart ZZZZ: Stationary Reciprocating Internal Combustion Engines.
- 40 CFR 60 Subpart A: General Provisions.
- 40 CFR 60 Subpart Db: Industrial-Commercial-Institutional Steam Generating Units
- 40 CFR 60 Subpart GG: Stationary Gas Turbines
- 40 CFR 60 Subpart IIII: Stationary Compression Ignition Internal Combustion Engines.

The Greenhouse Gas (GHG) emissions from this facility are 176,750 TPY CO₂e and the GHG emissions increase are less than 75,000 TPY CO₂e.

This renewal is not subject to PSD rules at 40 CFR 52.21.

VI. 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.

The facility has submitted a timely and complete application to renew their operating permit and an application shield is in effect.

This operating permit also 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.

Also, prior to the expiration of the five-year period, the facility will be required to apply for a renewal of this operating permit, at which time the Department will evaluate the facility and issue a public notice with its findings.

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VII. 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