May 23, 2023, 2023

Dominic Lacy

Chief Operating Officer

Gallaudet University

800 Florida Avenue NE

Washington, DC 20002

**RE: Permit Nos. 7330, 7331, and 7332 to Construct and Operate Three Natural Gas-Fired Internal Combustion Engine-Based Combined Heat and Power (CHP) Units at Gallaudet University, Central Utility Building, 800 Florida Avenue NE, Washington, DC**

Dear Mr. Lacy:

Pursuant to sections 200.1 and 200.2 of Title 20 of the District of Columbia Municipal Regulations (20 DCMR), a permit from the Department of Energy and Environment (“the Department”) shall be obtained before any person can construct and operate a stationary source in the District of Columbia. The applications of Gallaudet University (“the Permittee”) to construct and operate the three (3) 1.5 MWe (1,500 kWe) combined heat and power (CHP) generation units, each powered by a 2,095 hp rated natural gas-fired Mitsubishi Engine North America internal combustion engine, and whose emissions are controlled by a selective catalytic reduction (SCR) system, at Gallaudet University, 800 Florida Avenue NE, Washington DC, as described below, have been reviewed:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Equipment Location Address** | **Equipment Name** | **System Model** | **Engine Model** | **Generator Output (kWe)** | **Permit Number** |
| Central Utility Building 800 Florida Ave. NE Washington, DC | CHP # -1 | SMS1500G | GS16R2-PTK | 1,500 | 7330 |
| Central Utility Building800 Florida Ave. NE Washington, DC | CHP # -2 | SMS1500G | GS16R2-PTK | 1,500  | 7331 |
| Central Utility Building 800 Florida Ave. NE Washington, DC | CHP # -3 | SMS1500G | GS16R2-PTK | 1,500 | 7332 |

Based on the plans and specifications as detailed in the air permit applications received on July 19, 2022, the applications are hereby approved, and the construction and operation of the CHP systems CHP # -1, CHP # -2, and CHP # -3, are permitted, subject to the following conditions:

I. General Requirements:

* 1. This approval is issued pursuant to the air pollution control requirements of the applicable sections of 20 DCMR for the construction and operation of the CHP units.
	2. This set of permits will expire on May 22, 2028. If continued operation after this date is desired, the Permittee shall submit applications for renewal by January 22, 2028.

 [20 DCMR 200.4]

1. Construction or operation of equipment under the authority of this set of permits shall be considered acceptance of its terms and conditions.
2. The Permittee shall allow authorized officials of the District, upon presentation of identification, to:

1. Enter upon the Permittee’s premises where a source or emission unit is located, an emissions related activity is conducted, or where records required by this permit are kept;

2. Have access to and copy, at reasonable times, any records that must be kept under the terms and conditions of this permit;

3. Inspect, at reasonable times, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and

4. Sample or monitor, at reasonable times, any substance or parameter for the purpose of assuring compliance with this permit or any applicable requirement.

1. This set of permits shall be kept on the premises and produced upon request.
2. Failure to comply with the provisions of these permits may be grounds for suspension or revocation. [20 DCMR 202.2]

II. Emission Limitations:

a. Emissions from each engine, before the application of selective catalytic reduction (SCR), shall not exceed those in the following table [40 CFR 60.4233(e) and Subpart JJJJ, Table 1]:

|  |
| --- |
| **Pollutant Emission Limits1** |
| **(g/HP-hr)** | ppmvd at 15% O2 |
| NOx  | CO | VOC2 | NOx  | CO | VOC2 |
| 1.0 | 2.0 | 0.7 | 82 | 270 | 60 |

1The Permittee may choose to comply with the emission standards in this table in units of either g/HP-hr or ppmvd at 15 percent O2.

2For purposes of this requirement, when calculating emissions of VOCs, emissions of formaldehyde should not be included.

* 1. b. After application of SCR, required per Condition III(c), emissions from each CHP unit shall not exceed those in the following table [20 DCMR 201 and 20 DCMR 805.7(a)(2)]:

|  |
| --- |
| **Pollutant Emission Limits** |
| **(g/HP-hr)** | ppmvd at 15% O2 |
| NOx3  | CO | VOC (as NM-NEHC) | Formaldehyde(HCHO) | NH3 Slip |
| 0.07 | 0.2 | 0.125 | 0.072 | 10 |

3This is a streamlined emission limit. The requirements of 20 DCMR 805.7(a)(2) are less stringent than the manufacturer’s guarantee requested by the applicant and included pursuant to 20 DCMR 201. As such, compliance with this limit will ensure compliance with both regulations.

* 1. c. Visible emissions shall not be emitted into the outdoor atmosphere from the generators, except that discharges not exceeding forty percent (40%) opacity (unaveraged) shall be permitted for two (2) minutes in any sixty (60) minute period and for an aggregate of twelve (12) minutes in any twenty-four hour (24 hr.) period during start-up, cleaning, adjustment of combustion controls, or malfunction of the equipment [20 DCMR 606.1]

*Note that 20 DCMR 606 is subject to an EPA-issued call for a State Implementation Plan (SIP) revision (known as a “SIP call”) requiring the District to revise 20 DCMR 606. See “State Implementation Plans: Response to Petition for Rulemaking; Restatement and Update of EPA’s SSM Policy Applicable to SIPs; Findings of Substantial Inadequacy; and SIP Calls To Amend Provisions Applying to Excess Emissions During Periods of Startup, Shutdown and Malfunction”, 80 Fed. Reg. 33840 (June 12, 2015). It is likely that this federal action will result in changes to the requirements of 20 DCMR 606. Any such changes, once finalized in the DCMR, will supersede the language of Condition II(b) as stated above.*

d. An emission into the atmosphere of odorous or other air pollutants from any source in any quantity and of any characteristic, and duration which is, or is likely to be injurious to the public health or welfare, or which interferes with the reasonable enjoyment of life or property is prohibited. [20 DCMR 903.1]

III. Operational Limitations:

* 1. a. The generators shall fire only natural gas per the submitted plan and specifications. [20 DCMR 200.6 and 20 DCMR 201]

b. The generators shall be operated in accordance with the recommendations of the equipment manufacturers. [20 DCMR 201]

* 1. Except for the period during startup when the engine temperature is not yet high enough to support its operation, the Permittee shall ensure that a SCR system is installed and is operational and effective whenever an any of the CHP engines are operational. SCR operation shall be initiated as soon as the control device operating temperature is reached. [20 DCMR 102.1 and 20 DCMR 805.7(b)]

d. A maintenance plan shall be maintained at the facility and followed. [40 CFR 60.4243(b)(2)(ii)] At a minimum the maintenance plan shall include all maintenance requirements recommended by the engine, generator, and control device manufacturers. [20 DCMR 201 and, complying per Condition IV(a)(1), 40 CFR

e. At all times, including periods of startup, shutdown, and malfunction, the Permittee shall, to the extent practicable, maintain and operate the units in a manner consistent with good air pollution control practice for minimizing emissions [40 CFR 60.4243(b)(2)(ii) and 20 DCMR 805.7(c)(2)]. Determination of whether acceptable operating procedures are being used will be based on information available to the Department which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

f. The following maintenance tasks must be performed in accordance with the manufacturer’s recommended schedules or in accordance with the requirements of 40 CFR 63, Subpart ZZZZ, whichever is more frequent [20 DCMR 805.7(c)(4)]:

* + 1. Change oil and filter;
		2. Inspect the spark plugs; and
		3. Inspect all hoses and belts.
1. The engines must each have an installed non-resettable hour meter. [20 DCMR 805.7(c)(1)]

IV. Monitoring and Testing Requirements:

a. In order to show compliance with the requirements of Condition II(a), the Permittee shall do one of the following:

* + 1. Prior to initial operation of any of the CHP units, the Permittee must provide documentation to the Department that the engine model/year has been certified with EPA to comply with the applicable emission requirement of 40 CFR 60, Subpart JJJJ. This shall be achieved with the submittal of an EPA Certificate of Conformity or other EPA documentation of the certification; or
		2. If the engines have not been certified, the Permittee shall, within 60 days after achieving the maximum production rate or each CHP unit, but not later than 180 days after initial startup of the unit, the Permittee shall demonstrate compliance with Condition II(a) of this permit by performing an initial performance test on each unit according to the following requirements [40 CFR 60.8 and 60.4243(b)(2)(ii) and the requirements of Condition VI:

i. The performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and according to the requirements of 40 CFR 60.8 and under the conditions and methods specified in Table 2 of 40 CFR 60, Subpart JJJJ [40 CFR 60.4244(a) and Table 2 of 40 CFR 60 Subpart JJJJ].

ii. The performance test shall not be conducted during periods of startup, shutdown, or malfunction as specified in 40 CFR 60.8(c). If the generator to be tested is non-operational, it is not necessary to start up the engine solely to conduct the performance test; however, the performance test must be conducted immediately upon startup of the engine.

iii. Three separate test runs shall be performed for each performance test required in this section as specified in 40 CFR 60.8(f). Each test run must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least one hour.

iv. To determine compliance with the NOx mass per unit output emission limitation, convert the concentration of NOx in the engine exhaust using the following equation:



Where:

ER = Emission rate of NOx in g/HP-hr.

Cd = Measured NOx concentration in parts per million by volume (ppmv).

1.912x10-3 = Conversion constant for ppm NOx to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meter per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, horsepower-hour (HP-hr).

v. To determine compliance with the CO mass per unit output emission limitation, convert the concentration of CO in the engine exhaust using the following equation:



Where:

ER = Emission rate of CO in g/HP-hr.

Cd = Measured CO concentration in ppmv.

1.164x10-3 = Conversion constant for ppm CO to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine in HP-hr.

vi. For purposes of compliance with Condition II(a) and 40 CFR 60, Subpart JJJJ, when calculating emissions of VOC, emissions of formaldehyde should not be included. To determine compliance with the VOC mass per unit output emission limitation, convert the concentration of VOC in the engine exhaust using the following equation:



Where:

ER = Emission rate of VOC in g/HP-hr.

Cd = VOC concentration measured as propane in ppmv.

1.833x10-3 = Conversion constant for ppm VOC measured as propane, to grams per standard cubic meter at 20 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.

T = Time of test run, in hours.

HP-hr = Brake work of the engine, in HP-hr.

If the owner or operator chooses to measure VOC emissions using either Method 18 of 40 CFR 60, Appendix A, or Method 320 of 40 CFR 63, Appendix A, then it has the option of correcting the measured VOC emissions to account for the potential differences in measured values between these methods and Method 25A. The results from Method 18 and Method 320 can be corrected for response factor differences using Equations 4 and 5 of 40 CFR 60.4244. The corrected VOC concentration can then be places on a propane basis using Equation 6 of that same section.

b. If the engines are not EPA certified, the Permittee shall conduct subsequent testing of each engine in accordance with the procedures set forth in Condition IV(a)(2) every 8,760 hours of operation or every 3 years, whichever comes first, thereafter to demonstrate compliance. [40 CFR 60.4243(b)(2)(ii)]

1. In order to demonstrate compliance with Condition II(b), the Permittee shall:

Within 60 days after achieving the maximum production rate of each CHP unit, but not later than 180 days after initial startup of the unit, perform an initial performance test according to the procedures set forth in Condition IV(a)(2), except that testing for formaldehyde and ammonia shall also be performed to determine compliance [20 DCMR 104.2(b) and 20 DCMR 502.1];

If the engine is uncertified or EPA certified and more than seven (7) model years old, the Permittee shall, before December 31st of every fifth year, counting from December 31, 2021, perform NOx testing to determine compliance with the NOx emissions limit of Condition II(b). Tests shall be conducted at the highest achievable steady state load, which may require use of a load bank, but without creating and unsafe condition. [20 DCMR 805.7(d)(2) and 20 DCMR 805.10(a)(2)(C)(iii)]

d. In addition to the requirements of Conditions IV(a) through (c), the Permittee shall conduct and allow the Department access to conduct tests of air pollution emissions from any source as requested. [20 DCMR 502.1]

e. The Permittee shall maintain an awareness of the operation of the generator sets to identify potential exceedances of Conditions II(c) and (d) and shall comply with the following:

1. At least once each month, during operation of each unit, the Permittee shall observe whether or not visible emissions are perceived from the emission point. If visible emissions are observed from the unit during this observation or at any other time, the Permittee shall record the instance and have the visible emissions promptly tested by a qualified person certified to perform testing pursuant to 40 CFR 60, Reference Method 9 to determine compliance with Condition II(c) [20 DCMR 104.2(b) and 20 DCMR 502.1]; and

2. If odors or other deviations from the requirements of Condition II(d) are identified, such information shall be recorded as well as action taken to correct the problem in accordance with Condition VI(a)(3).

V. Notification and Reporting Requirements:

a. The Permittee shall provide the Department and, for testing required pursuant to Condition IV(a)(2) only, U.S. EPA, at least 30 days prior notice of any performance test required under Condition IV to afford the agencies the opportunity to have observers present. If after 30 days notice for an initially scheduled performance test, there is a delay (due to operational problems, etc.) in conducting the scheduled performance test, the Permittee shall notify the EPA Administrator (if EPA notification was required) and the Department as soon as possible of any delay in the original test date, either by providing at least 7 days prior notice of the rescheduled date of the performance test or by arranging a rescheduled date with the EPA Administrator and the Department by mutual agreement.

b. At least 30 days in advance of the proposed test date, a test protocol shall be submitted to the Department for review. The testing shall be conducted in accordance with Federal and District requirements.

c. The test protocol and test date(s) shall be approved by the Department prior to initiating any testing. The Department must have the opportunity to observe the test for the results to be considered for acceptance.

d. The results of the testing performed pursuant to Condition IV(a) shall be submitted to the Department and, for testing required pursuant to Condition IV(a)(2) only, EPA, within 60 days after completion of the testing program.

e. The final report of the results shall include the emissions test report (including raw data from the test) as well as a summary of the test results and a statement of compliance or non-compliance with permit conditions to be considered valid. The summary of results and statement of compliance or non-compliance shall contain the following information:

i. A statement that the Permittee has reviewed the report from the emissions testing firm and agrees with the findings.

ii. Permit number(s) and condition(s) which are the basis for the compliance evaluation.

iii. Summary of results with respect to each permit condition.

iv. Statement of compliance or non-compliance with each permit condition.

f. The results must demonstrate to the Department’s satisfaction that the emission unit is operating in compliance with the applicable regulations and conditions of this permit; if the final report of the test results shows non-compliance the owner or operator shall propose corrective action(s). Failure to demonstrate compliance through the test may result in enforcement action.

g. The notifications and reports required under Conditions V(a), (d) and (e) shall be submitted to the Department and, where applicable, EPA, at following addresses. The protocol required under Conditions V(b) and (c) need only be submitted to the Department at the following address.

air.quality@dc.gov

and

United States Environmental Protection Agency

Region III, Enforcement & Compliance Assurance Division

Air, RCRA and Toxics Branch (3ED21)

Four Penn Center

1600 John F. Kennedy Boulevard

Philadelphia, Pennsylvania 19103-2852

VI. Record Keeping and Reporting Requirements:

a. The following records shall be maintained at the facility (or an electronic location readily accessible from the facility) for the life of the permitted equipment [40 CFR 60.4245(a)]:

1. All notifications submitted pursuant to 40 CFR 60, Subpart JJJJ and all documentation supporting any notification;

2. Records of maintenance conducted on the engines *[Note that these records must be sufficient such that the Permittee is complying with the requirements of Condition III(d)]*;

3. Documentation that the engines meet the emission standards specified in Conditions II(a) and (b) of this permit, pursuant to the requirements of Conditions IV(a) through (d), including documentation of what was submitted to the Department and EPA; and

4. A copy of the equipment and control device manufacturers’ maintenance and operating recommendations as well as a copy of the maintenance plan for the equipment.

b. The following information shall be recorded, initialed, and maintained in a log at the facility or kept in an electronic format that can be verified as to its accuracy and stored at a location readily accessible from the facility, for a period not less than five (5) years [20 DCMR 302.1(c)(2)(B) and 20 DCMR 500. 8]:

1. Records of the results of any visible emissions monitoring performed in accordance with Condition IV(d)(1);

2. Records of the actions taken to correct any problems resulting in deviations from the requirements of Conditions II(c) and (d);

3. Records of the monitoring actions performed in accordance with Condition IV(e);

4. Records of all fuel purchases for the units to document compliance with Condition III(a) of the permit and to enable calculation of emissions from the units pursuant to Condition VI(c);

1. Records of the occurrence and duration of each malfunction of operation;
2. Records of the actions taken during periods of malfunction to minimize emissions, including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation; and
3. If the engines are uncertified, the Permittee shall keep records of the hours of operation of each unit, using the installed hour meter required pursuant to Condition III(g), to track when each repeat test is required pursuant to Condition IV(b).

c. The Permittee shall include the equipment covered by this permit in all reports required by the facility’s Title V permit, including, but not limited to, semi-annual and annual compliance certifications and reports and emissions reports.

If you have any questions, please call me at (202) 535-1747 or Abraham T. Hagos at (202) 535-1354.

Sincerely,

Stephen S. Ours, P.E.

Chief, Permitting Branch

SSO/ATH