

**GOVERNMENT OF THE DISTRICT OF COLUMBIA**  
Department of Energy and Environment

**CHAPTER 2 TECHNICAL MEMORANDUM**

TO: File

FROM: Stephen S. Ours, P.E.  
Chief, Permitting Branch

**SUBJECT: Gallaudet University  
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 the Gallaudet University Central Utility Building**

DATE: April 12, 2023

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**BACKGROUND INFORMATION**

On July 19, 2022 the Air Quality Division (AQD) received Chapter 2 permit applications to construct and operate three (3) 1,500 kWe combined heat and power (CHP) generator sets powered by 2,095 hp natural gas-fired engines at the Gallaudet University Central Utility Building. Gallaudet University is located at 800 Florida Avenue NE, Washington DC.

The publication of this permit action is planned for August 2, 2019 in the D. C. Register. Public comment for the permit action will be solicited through September 2, 2019.

Gallaudet University has not requested that any aspects of the application be held confidential.

**ISSUES**

In a series of discussions with Scale Microgrid staff, the CHP manufacturer assisting Gallaudet University with the permitting and installation of the units, it was confirmed that the model year 2022 natural gas-fired Mitsubishi Engine North America (MENA) engines that will power the units were not, at the time of application and permitting, certified by EPA to comply with the requirements of 40 CFR 60, Subpart JJJJ. However, Scale Microgrid indicated that they were concurrently seeking certification of the engines and hoped to have them fully certified prior to installation of the units at the site. As such, it was agreed that two different compliance methodologies would be set forth in the permit, depending upon whether the engines were EPA-certified or not at the time of engine startup.

**TECHNICAL INFORMATION**

Gallaudet University has proposed to install three 1,500 kWe (1.5 MWe) CHP units powered by 2,095 hp MENA model GS16R2-PTK natural gas-fired engines which the manufacturer has indicated meet the emissions requirements of 40 CFR 60, Subpart JJJJ, but are not yet certified by the U.S. Environmental Protection Agency, as discussed above. In order to reduce emissions further, Gallaudet University has proposed to install oxidation catalyst and selective catalytic reduction (SCR) systems provided by AeriNOx. AeriNOx has provided emissions guarantees for

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the equipment for oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOC) as non-methane, non-ethane hydrocarbons (NM-NEHC), formaldehyde, and ammonia (NH<sub>3</sub>) slip (ammonia that is injected into the flue gas, but emitted due to incomplete reaction to remove NO<sub>x</sub> from the exhaust gas).

Based on the vendor guaranteed emissions rates, and assuming 8,760 hours per year of operation, the CHP units, combined, have the potential to emit 4.25 tons per year of NO<sub>x</sub>, 7.59 tons per of VOC, 1.74 tons per year of total particulate matter, and 12.15 tons per year of CO.

#### **REGULATORY REVIEW**

##### 20 DCMR Chapter 2, Section 200: General Permit Requirements

The units to be permitted have the potential to emit air contaminants. Therefore a permit is required under 20 DCMR 200. The facility has applied for such permits, drafts of which have been prepared for public comment.

##### 20 DCMR Chapter 2, Section 204: Permit Requirements for Sources Affecting Non-Attainment Areas

Potential emissions of air pollutants do not reach New Source Review permitting thresholds, therefore 20 DCMR 204 is not applicable to this equipment.

##### 20 DCMR Chapter 2, Section 205: New Source Performance Standards

20 DCMR 205 is applicable to the equipment as it adopts most requirements of 40 CFR 60, Subpart JJJJ by reference. The applicability of that regulation is discussed below.

##### 20 DCMR Chapter 3: Operating Permits and Acid Rain Programs

Gallaudet University is subject to 20 DCMR Chapter 3 and currently holds an extended Title V permit. The requirements of this set of Chapter 2 permits will need to be incorporated into the Title V permit upon renewal. In the interim, the requirements of this set of permits is affected by the incorporation of the 5-year records retention requirement of Chapter 3 as well as the requirement to include the requirements of this set of permits in any compliance reports required by the Title V permit.

##### 20 DCMR Chapter 5: Testing, Monitoring and Record Keeping Requirements

Testing, monitoring and record keeping requirements pursuant to 20 DCMR 500.8 and 502 have been included in the permit documents under Conditions IV and V. Extensive testing requirements were placed in the permit to determine compliance with emission limits established under 40 CFR 60, Subpart JJJJ, NO<sub>x</sub> RACT (20 DCMR 805), and at the rates guaranteed by the manufacturer (20 DCMR 201). AQD also included minimal monitoring and testing requirements related to visible emissions and odor, as well as record keeping to ensure that the equipment is being operated and maintained appropriately.

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#### 20 DCMR Chapter 6: Particulates

20 DCMR 606.1, which states: “Visible emissions shall not be emitted into the outdoor atmosphere from this generator, 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 (24 hr) period during start-up, cleaning, adjustment of combustion controls, or malfunction of the equipment” is the only part of 20 DCMR, Chapter 6 that is applicable to this equipment. This requirement is included in Condition II(c) of the permit. Monitoring for visible emissions is required under Condition IV(e) of the permit. Conditions VI(b)(1) and (3) require records to be kept of the results of monthly monitoring and any other exceedances of the standard. AQD has included a note in the permit indicating that an EPA-issued “SIP call” may result in a revision to the visible emissions standard, in which case the new regulation would supersede the existing permit language.

#### 20 DCMR Chapter 7: Volatile Organic Compounds and Hazardous Air Pollutants

The equipment covered consists of internal combustion engines burning natural gas. Therefore VOC emissions are minimal and are not regulated under 20 DCMR, Chapter 7.

#### 20 DCMR Chapter 8: Asbestos, Sulfur, Nitrogen Oxides, and Lead

The fuel sulfur provision of 20 DCMR 801 is not applicable because the unit will not use fuel oil. The NO<sub>x</sub> RACT provisions of 20 DCMR 805 apply because the units will be located at a major source of NO<sub>x</sub>. In particular, the requirements for stationary engines apply. Although the emission limit in 20 DCMR 805.7(a)(2) applies, that limit has been streamlined with the more stringent limit based on the SCR manufacturer’s emissions guarantees. Maintenance requirements are incorporated in Condition III(f), while the requirement to have an installed non-resettable hour meter has been incorporated in Condition III(g). Emissions testing is required pursuant to Condition IV(c)(2).

#### 20 DCMR Chapter 9, Section 903: Odorous or Other Nuisance Air Pollutants

20 DCMR 903 states “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.” This requirement is specified in Condition II(d) of the permit. Condition IV(e)(2) requires general monitoring for compliance with this requirement. Records of any deviations from this standard must be kept and corrective action taken pursuant to Condition VI(b)(2) of the permit document.

#### Other Regulations

There are two federal regulations applicable to these generators. They are discussed below.

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#### 40 CFR 60, Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

This regulation specifies the emission limits included in Condition II(a) of this permit in 40 CFR 60.4233(e) and the referenced Table 1 of the subpart. These particular requirements are applicable due to the size of the units (2,095 hp) and the fuel they use (natural gas).

The installed units are not “certified according to the procedures in this subpart” [40 CFR 63.4243(b)(1)] (at this time), therefore, under 40 CFR 60.4243(b)(2)(ii), the facility must:

- a) Keep a maintenance plan (contained in Condition III(d) and VI(a)(4) of the permit);
- b) Perform initial performance testing (contained in Condition IV(a)(2) of the permit);
- c) Keep records of maintenance conducted (contained in Condition VI(a)(2) of the permit);
- d) Perform subsequent testing every 8,760 hours of operation or 3 years, whatever comes first (contained in Condition IV(b)); and
- e) Must, to the extent practicable, maintain and operate the engine[s] in a manner consistent with good air pollution control practices for minimizing emissions (contained in Condition III(e) of the permit).

However, if the engines become certified by EPA, as Scale Microgrid is proposing to do, prior to operations of the equipment commencing, repeat testing is not required by this regulation (see (d) above). This compliance alternative is contained in Condition IV(a)(1) of the permit.

#### 40 CFR 63, Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)

This is an area source maximum achievable control technology (MACT), and is therefore applicable despite the fact that hazardous air pollution (HAP) emissions from the units are quite small. However, 40 CFR 63.6590(c) indicates that, for new stationary reciprocating internal combustion engines (RICE) located at an area source of HAPs, the only requirements under this subpart is to comply with the requirements of 40 CFR 60, Subpart JJJJ.

Because this is a new stationary RICE located in an area source, complying with 40 CFR 60, Subpart JJJJ (previously discussed) meets the requirements of 40 CFR 63, Subpart ZZZZ.

#### Practical Enforceability

For each of the emission and operational limits and standards contained in the permit, sufficient monitoring, testing, record keeping, and reporting requirements have been specified in the permit to ensure that the emission and operational limits and standards are enforceable as a practical matter.

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### **RECOMMENDATIONS**

The application is scheduled for posting in the D.C. Register on April 21, 2023, and is available for public comment through Friday, May 22, 2023.

The proposed permit complies with all applicable federal and District air pollution control laws and regulations. Subject to receiving no adverse public comments with regard to a segment of this project or all of it, I recommend, based on this regulatory review that the attached permit document, comprising permits 7330, 7331 and 7332 be issued to Gallaudet University following completion of the public review period. If comments are received during the public review period, they will be addressed before any final action is taken on the permit applications.

SSO