


GOVERNMENT OF THE DISTRICT OF COLUMBIA


District Department of the Environment

Air Quality Division



CHAPTER 2 TECHNICAL MEMORANDUM

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

FROM: John C. Nwoke 
Engineer

SUBJECT: **District of Columbia Water and Sewer Authority
Blue Plains –Wastewater Treatment Plant
Permit Numbers 6422 and 6423
Permits to Construct and Operate Natural Gas-fired Steam Boilers**

DATE: December 3, 2012

BACKGROUND INFORMATION

On October 14, 2010 the District of Columbia Water and Sewer Authority (DC Water) submitted air permit applications to replace two existing natural gas-fired boilers with two smaller natural gas-fired boilers at the Blue Plains Advanced Wastewater Treatment Plant located at 5000 Overlook Avenue SW, Washington, DC.

In the past two years, DC Water has undertaken several contemporaneous projects, requiring air permits. DC Water developed a priority list for processing the various permit applications submitted to the Air Quality Division, in order to focus on more urgent projects. Consequently, the processing of the Central Maintenance Facility natural gas-fired boiler permit applications was not completed until quite recently.

As previously noted, the new boilers are to replace existing Central Maintenance Facility natural gas-fired boilers (C7 and C8). The replacement-in-kind involves the removal of the two 6.28 MMBTU/hr natural gas-fired boilers (C7 and C8) and installation of two 6.124 MMBTU/hr natural gas-fired boilers (C7-2 and C8-2).

DC Water has not requested that any portion of the application be held confidential.

TECHNICAL INFORMATION

The two new natural gas-fired boilers were manufactured by Cleaver Brooks and are of the four pass horizontal fire-tube updraft type construction with model number CBLE-150-15ST. The new boilers are steam boilers designed for 15 psig steam. The maximum operating pressure for the boilers is 10 psig.



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Emissions Evaluation

Table 1 below shows the emissions from each of the boiler, based on manufacturer-provided emission factors (except SO_x, which is based on an AP-42 factor).

Table 1 –Central Maintenance Facility Boiler Emissions

Pollutant	Emission Limits per boiler	
	(lbs/hr)	(tons/yr)
PM (Total) ¹	0.06	0.27
SO _x	0.004	0.02
NO _x	0.21	0.94
VOC	0.02	0.11
CO	0.22	0.96

⁽¹⁾ Total PM is the sum of the filterable PM and condensable PM.

The emissions are all less than the major source thresholds for all pollutants and the significance thresholds for New Source Review.

REGULATORY REVIEW

Chapter 2, Section 200: General Permit Requirements

The provisions of this section are applicable to the boilers as stationary sources of air pollution. A permit is therefore required to operate the boilers pursuant to 20 DCMR 200.1 and 200.2. The permit will be valid for five years.

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

The review of the Chapter 2 permit applications indicated that the facility would not exceed 25 tons per year of nitrogen oxides (NO_x).

The significance threshold for the DC-MD-VA nonattainment area for NO_x is 25 tons per year. The proposed project will not generate emissions increases over this threshold and therefore will not trigger NNSR analysis.

The Greenhouse Gas Monitoring and Reporting Rule

40 CFR 98 has requirements for monitoring and reporting of greenhouse gas such as CO₂, methane and nitrous oxide, if certain thresholds are exceeded. Additionally, combustion sources

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like boilers and gas turbines must report GHG emissions, if they emit 25,000 metric tons (tonnes) or more.

The boilers are not likely to produce this level of GHG emissions and so not subject to the rule. In any case, this is not an “applicable requirement” and therefore would not be placed in the Chapter 2 permit.

Chapter 2, Section 205: New Source Performance Standards

Subsection 205.1 of 20 DCMR adopts the federal New Source Performance Standards (NSPSs) under 40 CFR Part 60.

40 CFR 60 does not apply to the boilers because they are below the size thresholds for applicability of the potentially relevant NSPSs.

Chapter 3: Operating Permits and Acid Rain Programs

The project is not subject to the Acid Rain Program. The facility, however, is a major source of NO_x and therefore must obtain a Title V permit. Condition I(h) of the proposed permit requires that the facility apply to have the requirements of the permit placed in the facility’s Title V permit.

Chapter 6: Particulates

20 DCMR 600.1 is applicable to all fuel-burning equipment. As such, the requirements of this section have been included in Condition II(d) of the proposed permit. It is expected that proper maintenance and operation with natural gas will ensure that the equipment maintains compliance with this requirement. However, the Department has the authority, specified in the permit, to require testing at any time should it be deemed necessary.

Additionally, the boilers could emit visible emissions during any period of equipment startup, operation or shutdown and as such 20 DCMR 606.1 is applicable. This requirement is in Condition II(b) of the proposed permit. Although visible emissions are unlikely from these small natural gas fired boilers, minimal monitoring, record keeping, and reporting requirements have also been included in the permit.

Chapter 8: Asbestos, Sulfur, Nitrogen Oxides, and Lead

The provisions of this regulation are not applicable. The units will not burn fuel oil (20 DCMR 801) and are too small to trigger NO_x RACT requirements (20 DCMR 805) or the NO_x emission requirements of 20 DCMR 804.

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

The boilers could emit emissions during any period of equipment startup, operation or shutdown and as such 20 DCMR 903.1 is applicable. Proposed permit condition II(c) limits the extent of PM or odorous emissions from the boilers.

Other Regulations

Area Source Maximum Achievable Control Technology (MACT) Standards for ICI Boilers

Subpart JJJJJ of 40 CFR 63 regulate/monitor Hazardous Air Pollutants (HAPs) such as acetaldehyde, acrolein, benzene, toluene, xylene, cadmium, chromium, lead, etc, through surrogate compounds such as formaldehyde, Carbon Monoxide (CO) and/or Volatile Organic Compounds (VOC).

A facility that emits or has the potential to emit 10 tons/year of any single HAP or 25 tons/year of any combination of HAPs, is considered a Major Source. Any source that is not a Major Source is an Area Source. Because this facility's HAP status is still unresolved, an opinion, one way or another, with respect to subpart JJJJJ is premature. That notwithstanding, the boilers burn only natural gas and consequently this regulation does not apply to the boilers pursuant to 40 CFR 63.11193.

Compliance Assurance Monitoring (CAM): 40 CFR 64 – The project appears not to be subject to this Part because the pre-control emissions of pollutants for all sources are less than 25 tpy for VOC and 100 tpy for NH₃ and H₂S, respectively.

Testing, Monitoring and Record Keeping Requirements:

Testing, monitoring and record keeping requirements pursuant to 20 DCMR 500.2 and 502 have been included in the permit documents under Permit Conditions V and IV.

RECOMMENDATIONS

The draft permit is scheduled for publication in the DC Register and on the DDOE website on December 7, 2012 for a thirty-day public comment period.

The proposed project and attached permit comply with all applicable federal and District air pollution control laws and regulations. I recommend that the attached permit documents be issued if no comments are received following the completion of the public review period. If comments are received, they will be addressed before any final permit decision is made.

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