

GOVERNMENT OF THE DISTRICT OF COLUMBIA

District Department of the Environment

Air Quality Division



CHAPTER 2 TECHNICAL SUPPORT MEMORANDUM

TO File

FROM: Stephen S. Ours, P.E. 
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John Nwoke 
Environmental Engineer

**SUBJECT: Skanska Jay Dee –First Street Tunnel Project
Permit Nos. 6867 and 6868
Permit to Construct and Operate Two Natural Gas Non-Emergency
Generators**

DATE: May 27, 2014

BACKGROUND INFORMATION

Skanska Jay Dee JV submitted an application package for the First Street Tunnel temporary power facility associated with DC Water, DC Clean Rivers Project to power the Tunnel Boring Machine, a refrigeration facility, and miscellaneous other equipment. The application was received on April 9, 2014 for one diesel emergency generator and four identical natural gas non-emergency generators. It was subsequently determined that, because two of the four natural gas non-emergency generators, used primarily to power the tunnel boring machine, would be at the site for less than 12 months, they would be considered non-road engines and were therefore not subject to permitting requirements.

Subsequent information was received, in response to questions from the Air Quality Division (“AQD”) of the District Department of the Environment (“DDOE” or “the Department”) on several dates including April 24, 25, and 28, 2014 and May 5, 22, and 24, 2014. The May 22, 2014 submittal included revised application forms.

The application filing was received after January 1, 2014, the date the District of Columbia Minor New Source Review regulation came into effect. As will be shown later, the construction and operation of the natural gas generators and diesel generator therefore triggered the minor new source review rule found at 20 DCMR 209.

The Company has not requested that any of the materials submitted with this application be held confidential.



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TECHNICAL INFORMATION

The two identical natural gas generators to be permitted have lean burn spark ignition Cummins engines rated at 1,747 bhp each with Non-Selective Catalytic Reduction controls for emissions reduction.

The units were not originally constructed to meet federal emission standards. However, they were retrofitted with the aforementioned controls in accordance with an administrative settlement agreement (AED/MSEB-8044) with the U.S. Environmental Protection Agency (EPA), signed September 12, 2013, in order to be approved for their intended use.

Initially, in a response to an information request from John Nwoke, Skanska provided information indicating that the engine serial numbers would be 33197237 and 33197260 for units 1 and 2, respectively. After Stephen Ours inquired, indicating that these numbers were not listed on the administrative settlement agreement, in an email from Mitchell Goldstein of Skanska, it was confirmed that the actual engine serial numbers would be 33177987 and 33181859 for units 1 and 2, respectively. Engines with these serial numbers are, in fact, covered by the administrative settlement agreement. It should be noted that it appears that a typographical error occurred on the May 22, 2014 application indicating that the serial number for Unit 1 is 33177967.

REGULATORY REVIEW

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

The two natural gas fired non-emergency generators have the potential to emit air pollutants. They will be at the site in excess of 12 months, and therefore will be considered “stationary sources” rather than “non-road engines”. Therefore, pursuant to the requirements of 20 DCMR 200.1 and 200.2, Skanska is seeking Chapter 2 permits for these units.

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

AQD evaluated the potential emissions of the stationary sources to be installed at the site, specifically the two natural gas fired generators covered by this permitting action and a diesel fired emergency generator. The potential emissions of these three units do not exceed the major source thresholds for any pollutants.

It should be noted that the two additional natural gas fired generators and other diesel construction generators planned for the site would make the project exceed the major source thresholds, if combined with the previously mentioned three stationary sources. However, it was determined that these units should not be considered because they are not considered “stationary

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sources”; rather they are considered non-road engines. As such, their contributions to facility emissions were not considered in evaluating Section 204 applicability.

20 DCMR Chapter 2, Section 209: Permit Requirements for Non-Major Stationary Sources (Minor New Source Review):

The internal combustion engines associated with this project were evaluated for Minor New Source Review (MNSR) pursuant to 20 DCMR 209.1 and were found to be subject to the provisions of 20 DCMR 209.3, because the potential to emit NO_x from each of the engines is more than 5 tons per year.

As part of their May 22, 2014 submission, Skanska provided an MNSR analysis evaluating a number of alternative control options. They also performed a review of the national RACT/BACT/LAER Clearinghouse (RBLC) data. The lowest value in the RBLC for spark ignition natural gas fired engines was 0.07 g/hp-hr using a 3-way catalytic converter. This technology was eliminated as it is only effective in stoichiometric or rich-burn engines. The second most stringent limit was 0.21 g/hp-hr using selective catalytic reduction (SCR). This technology was eliminated due to its cost. Skanska indicated that they had received a quote from Boulden Energy Systems indicating that the total equipment cost of SCR for this project would be \$370,000 for the installation plus approximately \$24,000 per year for operational costs. Given the temporary nature of the project (albeit longer than a year), AQD agrees that this cost is excessive and therefore this technology can be eliminated from consideration in this case.

The third most stringent limit in the RBLC was 0.5 g/hp-hr. This is consistent with the expected, but not guaranteed output of the engines being reviewed. The manufacturer’s documentation indicates that a +/- 20% range should be applied to the 0.5 g/hp-hr expected emission value. As such, the applicant has applied for a 0.6 g/hp-hr limit.

While this is higher than the numerous 0.5 g/hp-hr limits in the RBLC, it is lower than other determinations. It is also significantly lower than the 1.0 g/hp-hr which would otherwise be required of engines of this type pursuant to 40 CFR 60, Subpart JJJJ.

As such, although AQD does not accept 0.6 g/hp-hr as Best Available Control Technology (BACT), it has been determined that this control technology, lean burn technology with an EmeraChem, LLC oxidation catalyst (ADCATTM Performax Oxidation Catalyst, part number EC-OX-PX-RO-2350-0000-3500), meets the requirements of 20 DCMR 209 and that the analysis provided by Skanska meets the case-by-case determination requirements specified in 20 DCMR 209.3(e) and 209.4.

20 DCMR Chapter 6: Particulates:

The visible emission standards of 20 DCMR 606 is applicable to this facility. Condition II(b) was included in the permit to reflect these limitations. Additionally, Conditions IV(d) and (e)

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contain monitoring and testing requirements to determine compliance with the standards and Condition V(a)1)(E) contains record keeping requirements to document the results of the monitoring and testing.

20 DCMR Chapter 8, Section 805: Reasonably Available Control Technology (RACT)

The project was evaluated for the applicability of RACT to the generator engines. This rule is applicable to “any person owning, leasing, operating or controlling any *major stationary source* [emphasis added] having the potential to emit twenty-five (25) tons per year or more of oxides of nitrogen, including the following major stationary sources... Any major stationary source or part of a major stationary source, other than those specified in this subsection, having the potential to emit twenty-five (25) tons per year or more of NO_x”.

The three stationary sources (two natural gas fired non-emergency generators and one diesel fired emergency generator) do not constitute a “major stationary source” as NO_x emissions are expected to be below 25 tons per year from those units, combined. The other units known to be planned for the site (two additional natural gas fired non-emergency generators and one or more diesel fired portable construction generators) will not be on site for more than 12 months, therefore they are considered non-road engines, not stationary sources, and are therefore not considered in determining 20 DCMR 805 applicability.

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

“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]” is applicable to all sources. It is contained in Condition II(c) of the permit.

Other Regulations

The stationary natural gas generators covered by this permitting action are subject to Subpart JJJJ and the provisions of non-certified engines are applicable. Since the engines are not certified by the EPA, 40 CFR 60.4243(b) is applicable. All other applicable provisions of Subpart JJJJ have been included in the set of permits.

The units are subject to 40 CFR 63, Subpart ZZZZ, National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. However, pursuant to 40 CFR 63.6590(c)(1), their only requirement under that regulation is to comply with the aforementioned 40 CFR 60, Subpart JJJJ.

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All appropriate record keeping requirements were included in Condition V of the permit, including those found at 40 CFR 60.4245. It should be noted that records will be required to be kept for three years per 20 DCMR 500.8.

RECOMMENDATIONS

The public notice is scheduled to be published in the D.C. Register on May 30, 2014. The public comment period will end June 30, 2014.

The proposed project and attached permit comply with all applicable federal and District air pollution control laws and regulations.

If no public comment has been received by the end of the comment period, it is recommended that the permits be issued.

JCN/SSO

