July 1, 2014

Scott Hoffman

Project Manager

Skanska Jay Dee JV

2507 First Street, NW

Washington, DC 20001

**RE: Permits (#6867 and #6868) to Construct and Operate Two 1,303 kW Natural Gas-Fired Non-Emergency Generator Sets for the DC Clean Rivers Project - First Street Tunnel**

Dear Mr. Hoffman:

Pursuant to sections 200.1 and 200.2 of Title 20 of the District of Columbia Municipal Regulations (20 DCMR), a permit from the District Department of the Environment (the Department) shall be obtained before any person can construct and operate a stationary source in the District of Columbia. The applications of Skanska Jay Dee JV (the Permittee) to construct and operate two identical 1,303 kW natural gas-fired non-emergency generator sets each with engines rated at 1,747 hp (Unit 1-S/N: 33177987 and Unit 2- S/N: 33181859), at the First Street Tunnel project location, McMillan Reservoir site, 2507 First Street NW, Washington DC, per the submitted plans and specifications, received on April 9, 2014 as revised by subsequent communications and a revised application received on May 22, 2014, is hereby approved, subject to the following conditions:

I. General Requirements:

a. The generator sets shall be maintained and operated in accordance with the air pollution control requirements of 20 DCMR.

b. This permit expires on June 30, 2019 [20 DCMR 200.4]. If continued operation after this date is desired, the owner or operator shall submit a renewal application by March 31, 2019.

c. Construction or operation of equipment under the authority of this permit shall be considered acceptance of its terms and conditions.

d. 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.

e. This permit document shall be kept on the premises and produced upon request.

1. Failure to comply with the provisions of this permit may be grounds for suspension or revocation. [20 DCMR 202.2]

II. Emission Limitations:

a. Emissions from these units shall not exceed those in the following table. [20 DCMR 209 (for NOx), 40 CFR 60.4233(e) and Subpart JJJJ, Table 1 (for non-emergency spark ignition natural gas units manufactured after July 1, 2010)]:

|  |  |  |
| --- | --- | --- |
| **Pollutant Emission Limits (g/HP-hr)** | | |
| NOx | CO | VOCb |
| 0.6a | 2.0 | 0.7 |

aNote that this is a streamlined emission limit. 40 CFR 60, Subpart JJJJ indicates a limit of 1.0 g/HP-hr, but based on the applicant’s evaluation pursuant to 20 DCMR 209, it was determined that an emission limit of 0.6 g/HP-hr was appropriate and is therefore included here as the more stringent requirement.

bNote that per 40 CFR 60.4244(f), this VOC limit excludes formaldehyde.

b. Visible emissions shall not be emitted into the outdoor atmosphere from the generator engines, 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].

c. 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:

a. The generator engines shall fire only natural gas per the submitted plan and specifications. [20 DCMR 201]

b. The generator sets, including the EmeraChem, LLC oxidation catalyst (ADCATTM Performax Oxidation Catalyst, part number EC-OX-PX-RO-2350-0000-3500) system shall be operated and maintained in accordance with the recommendations of the equipment manufacturers.

c. The owner or operator of the generator engines shall use air-to-fuel (AFR) ratio controllers with the operation of three-way catalysts/non-selective catalytic reduction. [40 CFR 60.4243 (g)]

d. The AFR controller must be maintained and operated appropriately in order to ensure proper operation of the engines and control device to minimize emissions at all times. [40 CFR 60.4243 (g)]

e. The generator engines shall not be operated in conjunction with a voluntary demand-reduction program or any other interruptible power supply arrangement with a utility, other market participant, or system operator.

d. 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. 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.

IV. Monitoring and Testing Requirements:

1. The Permittee must conduct an initial performance test pursuant to 20 DCMR 60.8 within 60 days after achieving the maximum production rate at which each generator will be operated, but not later than 180 days after the initial start-up of each generator and must conduct subsequent performance testing every 8,760 hours of operation or 3 years, whichever is sooner, thereafter to demonstrate compliance. [40 CFR 60.4243(b)(2)(ii)]
2. In order to ensure compliance with Condition II(a), the Permittee shall conduct performance tests by using the following procedures [60 CFR 60.4244]:

1. Each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and according to the requirements in 40 CFR 60.8 and under the specific conditions that are specified by Table 2 to 40 CFR Part 60 Subpart JJJJ.

2. The Permittee shall not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in 40 CFR 60.8(c). If the generator engine is non-operational, the engine need not be started up solely to conduct a performance test; however the performance test must be conducted immediately upon startup of the engine.

3. The Permittee must conduct three separate test runs 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 1 hour.

4. To determine compliance with the NOx mass per unit output emission limitation, the Permittee must convert the concentration of NOx in the engine exhaust using Equation 1 below:

ER = Cd x 1.92 x 10-3 x Q x T (Eq. 1)

HP - hr

Where:

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

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

1.92 x 10-3 = 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).

5. To determine compliance with the CO mass per unit output emission limitation, the Permittee must convert the concentration of CO in the engine exhaust using Equation 2 below:

ER = Cd x 1.164 x 10-3 x Q x T (Eq. 2)

HP - hr

Where:

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

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

1.164 x 10-3 = Conversion constant for ppm CO to grams per standard cubic meter at 20 degrees Celsius.

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

T = Time of test run, in hours.

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

6. To determine compliance with the VOC mass per unit output emission limitation, the Permittee must convert the concentration of VOC in the engine exhaust using Equation 3 below:

ER = Cd x 1.833 x 10-3 x Q x T (Eq. 3)

HP - hr

Where:

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

Cd = VOC concentration measured as propane in ppmv.

1.833 x 10-3 = Conversion constant for ppm VOCmeasured as propane, 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).

For the purposes of determining compliance with the VOC limit in Condition II(a), when calculating emissions of VOC, emissions of formaldehyde should not be included.

7. If the Permittee 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 below. The corrected VOC concentration can then be placed on a propane basis using Equation 6 below.

RFi = CMi (Eq. 4)

CAi

Where:

RFi = Response factor of compound i when measured with EPA Method 25A.

CMi = Measured concentration of compound i in ppmv as carbon.

CAi = True concentration of compound i in ppmv as carbon.

Cicorr = RFi x Cimeas (Eq. 5)

Where:

Cicorr = Concentration of compound i corrected to the value that would have been measured by EPA Method 25A, ppmv as carbon.

C imeas = Concentration of compound i measured by EPA Method 320, ppmv as carbon.

CPeq = 0.6098 x Cicorr (Eq. 6)

Where:

CPeq = Concentration of compound i in mg of propane equivalent per DSCM.

c. In addition to the procedures set forth in Condition IV(b) as required by 40 CFR 60.4244, the Permittee shall follow the following procedures for performance testing documentation:

1. One (1) original and one (1) copy of the test protocol shall be submitted to the following address a minimum of thirty (30) days in advance of the proposed test date. The test shall be conducted in accordance with federal and District requirements.

Chief, Compliance and Enforcement Branch

Air Quality Division

1200 First Street, NE

5th Floor

Washington, DC 20002

2. The test protocol shall be approved by the District prior to initiating any testing. Upon approval of the test protocol, the Company shall finalize the test date with the assigned inspector in the Compliance and Enforcement Branch. The District must have the opportunity to observe the test for the results to be considered for acceptance.

3. The final results of the testing shall be submitted to the District and EPA within sixty (60) days of the test completion. One (1) original and one (1) copy of the test report shall be submitted to the address in Condition IV(c)(1) above. Additionally, a copy shall be submitted to the following address:

Director, Air Protection Division

Mail Code 3AP00

1650 Arch Street

Philadelphia, PA 19103-2029

4. 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.

5. The results must demonstrate to the District’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.

d. The owner or operator shall monitor the exhaust stack of each generator at least once each month, while in operation, to ensure compliance with Condition II(b). Except during start-up, cleaning, adjustment of combustion controls, or malfunction of the equipment, if emissions are visible, the owner or operator shall make arrangements for prompt visible emissions testing by a person certified in accordance with EPA Reference Method 9 (40 CFR 60, Appendix A). Such a test shall consist of a minimum of 30 minutes of opacity observations for the generator in question [20 DCMR 502.1]. Alternatively, rather than performing Method 9 testing, the owner or operator may shut down the equipment and make repairs and monitor the equipment upon start-up to ensure that emissions are within the requirements of Condition II(b).

e. Regardless of whether or not emissions are observed pursuant to Condition IV(e), the owner or operator shall conduct a minimum of one visible emissions test of each generator each year. Such a test program shall consist of a minimum of 30 minutes of opacity observations of each generator and shall be performed by a person certified in accordance with EPA Reference Method 9 (40 CFR 60, Appendix A) [20 DCMR 502.1].

f. 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]

V. Notification, Reporting and Record Keeping Requirements:

a. The Permittee shall meet the following notification, reporting and recordkeeping requirements , and the applicable information shall be recorded, initialed (when data are being directly taken and recorded), and maintained at the facility for a period not less than three (3) years (except if the equipment is removed from the site, in which case the information shall be retained by the Permittee for the remainder of the 3-year period [20 DCMR 500. 8, 40 CFR 60.4244(b)(2)(ii), and 40 CFR 60.4245]:

1. The Permittee shall keep records of:

A. All notifications submitted to comply with 40 CFR Part 60, Subpart JJJJ, and all documentations supporting any notification;

B. A formal, written, maintenance plan;

C. Maintenance performed on the generator sets, including the engine and the NSCR system;

D. Either:

i. If the engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 90, 1048, 1054, and 1060, as applicable; or

ii. If the engine is not a certified engine, documentation that the engines meet the emission standards of Condition II(a);

E. The results of any visible emissions monitoring and testing performed;

F. The occurrence of any visible emissions observed and records of repairs made pursuant to Condition IV(d);

F. The results of all performance testing performed;

G. The occurrence and duration of each malfunction of operation; and

H. The actions taken during periods of malfunction to minimize emissions, including corrective actions to restore malfunction process and air pollution control and monitoring equipment to its normal or usual manner of operation.

b. The owner or operator shall maintain a copy of the emergency generator’s manufacturer’s maintenance and operating recommendations at the facility.

c. The owner or operator of generator engine that is not certified by the engine manufacturer to meet the emission standards in 40 CFR 60.4231 must submit an initial notification as required in 40 CFR 60.7(a)(1). The notification must include the following information:

1. The name and address of the owner or operator;

2. The location address of the generator engine being permitted;

3. The following engine information:

A. The make;

B. The model;

C. The engine family;

D. The serial number;

E. The model year;

F. The maximum engine power; and

G. The engine displacement.

4. The emission control equipment; and

5. The fuel used.

If you have any questions, please call me at (202) 535-1747 or John Nwoke at (202) 724-7778.

Sincerely,

Stephen S. Ours, P.E.

Chief, Permitting Branch

SSO:JCN