NRO-063-14

COMMONWEALTH of VIRGINIA

Molly Joseph Ward
Secretary of Natural Resources

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193-1453
(703) 583-3800 Fax (703) 583-3821
www.deq.virginia.gov

David K. Paylor
Director

Thomas A. Faha
Regional Director

May 8, 2014

Mr. Osvaldo Morales
Director
VADATA, Inc.
c/o AMEC E&I
14424 Albemarle Point Place Suite 115
Chantilly, VA 20151

Location: Prince William County
Registration No.: 73995
Plant ID No.: 153-00914

Dear Mr. Morales:

Attached is permit to construct and operate additional diesel emergency generators in accordance with the provisions of the Commonwealth of Virginia State Air Pollution Control Board's (Board's) Regulations for the Control and Abatement of Air Pollution (Regulations). This permit document supersedes your permit document dated October 22, 2013.

In the course of evaluating the application and arriving at a final decision to approve the project, the Department of Environmental Quality (DEQ) deemed the application complete on April 28, 2014.

This permit contains legally enforceable conditions. Failure to comply may result in a Notice of Violation and/or civil charges. Please read all permit conditions carefully.

This permit approval to construct and operate shall not relieve VADATA, Incorporated of the responsibility to comply with all other local, state, and federal permit regulations. It should be noted that the diesel engines (Ref. Nos. 1 through 51 and Transitory Engines 1 through 6) are affected facilities under 40 CFR 60, New Source Performance Standard (NSPS) Subpart IIII and 40 CFR 63, National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT) Subpart ZZZZ. Each unit is required to comply with certain federal emission standards and operating limitations over the useful life of the unit. As the owner/operator of the units, the DEQ advises you to review the NSPS and MACT to ensure compliance with applicable emission standards, operational limitations, and the monitoring, notification, reporting and recordkeeping requirements. Applicable notifications shall be sent to EPA, Region III. Both the NSPS and MACT can be found at **www.ecfr.gov.**

The Board's Regulations as contained in Title 9 of the Virginia Administrative Code (VAC) 5-170-200 provide that you may request a formal hearing from this case decision by filing a petition with the Board within 30 days after this case decision notice was mailed or delivered to you. 9 VAC 5-170-200 also provides that you may request direct consideration of the decision by the Board if the Director of the DEQ made the decision. Please consult the relevant regulations for additional requirements for such requests.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have 30 days from the date you actually received this permit or the date on which it was mailed to you, whichever occurred first, within which to initiate an appeal of this decision by filing a Notice of Appeal with:

David K. Paylor, Director
Department of Environmental Quality
P. O. Box 1105
Richmond, VA 23218

If this permit was delivered to you by mail, three days are added to the 30-day period in which to file an appeal. Please refer to Part Two A of the Rules of the Supreme Court of Virginia for information on the required content of the Notice of Appeal and for additional requirements governing appeals from decisions of administrative agencies.

If you have any questions concerning this permit, please contact Justin Wilkinson at (703) 583-3820.

Sincerely,

James B. LaFratta
Regional Air Permit Manager

TAF/JLB/JAW/14063mNSR.doc

Attachment: Permit

cc: Regional Air Compliance Manager (electronic file submission)
File 73995

NRO-063-14

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David K. Paylor
Director

Thomas A. Faha
Regional Director

STATIONARY SOURCE PERMIT TO CONSTRUCT AND OPERATE

This permit document supersedes your permit document dated October 22, 2013.

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

VADATA, Inc.
c/o AMEC E&I
14424 Albemarle Point Place Suite 115
Chantilly, VA 20151
Registration No.: 73995

is authorized to construct and operate

diesel emergency generators at data centers

located at

7600 Doane Drive (IAD59),
11800 Brewers Spring Road (IAD-52),
and
11801 Brewers Spring Road for (IAD-14)
Manassas, VA 20109

in accordance with the Conditions of this permit.

Approved on May 8, 2014

Thomas A. Faha
Regional Director

Permit consists of 14 pages.
Permit Conditions 1 to 29.

Attachment: Appendix A – Conditional Approval Letter (6 pages)

INTRODUCTION

This permit document is based on and combines permit terms and conditions in accordance with 9 VAC 5-80-1255 from the following permit approvals and respective permit applications:

- Minor new source review permit approval dated May 8, 2014, based on the permit application dated April 18, 2014;
- Minor new source review permit approval dated October 22, 2013, based on the permit application dated July 31, 2013 (with additional information submitted on August 15, 2013);
- Minor amendment to the new source review permit approval dated January 11, 2013, based on the application dated November 19, 2012;
- Minor new source review permit approval dated July 2, 2012, based on the permit application dated June 1, 2012; and
- Minor new source review permit approval dated April 25, 2012, based on the permit application dated February 29, 2012.

Any changes in the permit application specifications or any existing facilities which alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-80-1110 and 9 VAC 5-10-10 of the Commonwealth of Virginia State Air Pollution Control Board's (Board's) Regulations (Regulations) for the Control and Abatement of Air Pollution. The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the permittee to requests by the Department of Environmental Quality (DEQ) or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the Board's Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

PROCESS REQUIREMENTS

1. **Equipment List -**

Equipment to be Constructed at IAD-59:				
Reference No.	**Equipment Description**	**Rated Capacity**	**Federal Requirements**	**Original Permit Date**
39	One (1) Caterpillar Model 3516C-HD Diesel Engine-Generator Set	2,500 ekW 3,634 bhp	9 VAC 5-50-410 and 9 VAC 5-60-100	May 8, 2014
40 – 51	Twelve (12) Caterpillar Model 3516C Diesel Engine-Generator Sets	2,000 ekW 2,937 bhp (each)	9 VAC 5-50-410 and 9 VAC 5-60-100	May 8, 2014

Equipment Previously Permitted at IAD-14:				
Reference No.	**Equipment Description**	**Rated Capacity**	**Federal Requirements**	**Original Permit Date**
1	One (1) Caterpillar Model 3512C Diesel Engine-Generator Set	1,500 ekW 2,206 bhp	9 VAC 5-50-410 and 9 VAC 5-60-100	January 11, 2013
2 – 20	Nineteen (19) Caterpillar Model 3516C-HD Diesel Engine-Generator Sets	2,500 ekW 3,634 bhp (each)	9 VAC 5-50-410 and 9 VAC 5-60-100	April 25, 2012

Equipment Previously Permitted at IAD-52:				
Reference No.	**Equipment Description**	**Rated Capacity**	**Federal Requirements**	**Original Permit Date**
21 - 38	Eighteen (18) Caterpillar Model 3516C-HD Diesel Engine-Generator Sets	2,500 ekW 3,634 bhp (each)	9 VAC 5-50-410 and 9 VAC 5-60-100	October 22, 2013

Transitory Equipment to be operated:				
Reference No.	**Equipment Description**	**Rated Capacity**	**Federal Requirements**	**Original Permit Date**
Transitory Engine 1	One (1) Caterpillar model 3516 C Diesel Engine-Generator Set	2,000 kW 2,937 bhp	9 VAC 5-50-410 and 9 VAC 5-60-100	July 2, 2012
Transitory Engine 2	One (1) Caterpillar model 3516 C Diesel Engine-Generator Set	2,000 kW 2,937 bhp	9 VAC 5-50-410 and 9 VAC 5-60-100	July 2, 2012
Transitory Engine 3	One (1) Caterpillar model 3516 C Diesel Engine-Generator Set	2,000 kW 2,937 bhp	9 VAC 5-50-410 and 9 VAC 5-60-100	July 2, 2012
Transitory Engine 4	One (1) Caterpillar model 3516 C Diesel Engine-Generator Set	2,000 kW 2,937 bhp	9 VAC 5-50-410 and 9 VAC 5-60-100	July 2, 2012

Transitory Equipment to be operated (continued):				
Reference No.	**Equipment Description**	**Rated Capacity**	**Federal Requirements**	**Original Permit Date**
Transitory Engine 5	One (1) Caterpillar model 3516 C Diesel Engine-Generator Set	2,000 kW 2,937 bhp	9 VAC 5-50-410 and 9 VAC 5-60-100	May 8, 2014
Transitory Engine 6	One (1) Caterpillar model 3516 C Diesel Engine-Generator Set	2,000 kW 2,937 bhp	9 VAC 5-50-410 and 9 VAC 5-60-100	May 8, 2014

(9 VAC 80-1180 D 3)

2. **Emission Controls** – Emissions from the diesel engines shall be controlled by the following:

   a. Nitrogen oxides (NO_X) emissions from the engine-generator sets (Ref. Nos. 1 through 51, and Transitory Engines 1 through 6) shall be controlled by electronic fuel injection and turbocharged engines. The permittee shall maintain documentation that demonstrates the control devices have been installed on the engine-generator sets.

   b. Carbon monoxide (CO), particulate matter ($PM_{10}/PM_{2.5}$), volatile organic compounds (VOCs), and visible emissions from the engine-generator sets (Ref. Nos. 1 through 51, and Transitory Engines 1 through 6) shall be controlled by the use of good operating practices and performing maintenance in accordance with the manufacturer recommendations. In addition, the permittee may only change those settings that are permitted by the manufacturer and do not degrade the air emissions from the engines.

   (9 VAC 5-80-1180 and 9 VAC 5-50-260)

3. **Monitoring** –

   a. Fuel Flow: Each diesel engine (Ref. Nos. 1 through 51 and Transitory Engines 1 through 6) shall be equipped with a device to continuously measure and record individual fuel consumption (in gallons) for each diesel engine.

   b. Engine Operating Hours: Each diesel engine (Ref. Nos. 1 through 51 and Transitory Engines 1 through 6) shall be equipped with a non-resettable hour meter which measures the duration of time that an engine is operated.

   Each monitoring device (as required in a. and b. above) shall be observed by the permittee with a frequency of not less than once each day the engine-generator set is operated. The permittee shall keep a log of these observations.

   Each monitoring device shall be installed, maintained, calibrated (as appropriate), and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. The details of the monitoring device calibrations are to be arranged with the Regional Air Compliance Manager of the DEQ's NRO.

Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the engines are operating.
(9 VAC 5-80-1180 D, 9 VAC 5-50-20 C, and 9 VAC 5-50-260)

4. **Monitoring Device Observation** – To ensure proper performance, the monitoring devices used to continuously measure operating hours and fuel flow shall be observed by the permittee at a minimum frequency of once per day during days in which the diesel engines are called into service in a manner appropriate to observe the total operating hours and total fuel consumed for that day. Refer to Condition 17 for record keeping requirements to demonstrate compliance with this condition.
(9 VAC 5-80-1180)

OPERATING LIMITATIONS

5. **Operating Hours** – No single engine-generator set (Ref. Nos. 1 through 51 and Transitory Engines 1 through 6) shall operate more than 500 hours per year, calculated monthly as the sum of each consecutive 12 month period. Compliance for the consecutive 12 month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
(9 VAC 5-80-1180)

6. **Emergency Power Generation** – The engine-generator sets (Ref. Nos. 1 through 51 and Transitory Engines 1 through 6) shall only be operated in the following modes:

   a. In situations that arises from sudden and reasonably unforeseeable events where the primary energy or power source is disrupted or disconnected due to conditions beyond the control of an owner or operator of a facility including:

      i. A failure of the electrical grid;

      ii. On-site disaster or equipment failure; or

      iii. Public service emergencies such as flood, fire, natural disaster, or severe weather conditions.

   b. For participation in an ISO-declared emergency, where an ISO emergency is:

      i. An abnormal system condition requiring manual or automatic action to maintain system frequency, to prevent loss of firm load, equipment damage, or tripping of system elements that could adversely affect the reliability of an electric system or the safety of persons or property;

      ii. Capacity deficiency or capacity excess conditions;

      iii. A fuel shortage requiring departure from normal operating procedures in order to minimize the use of such scarce fuel;

iv. Abnormal natural events or man-made threats that would require conservative operations to posture the system in a more reliable state; or

v. An abnormal event external to the ISO service territory that may require ISO action.

c. For periodic maintenance, testing, and operational training.

Total emissions for any 12 month period, calculated as the sum of all emissions from operations under the scenarios above, shall not exceed the limits stated in Condition 10. (9 VAC 5-80-1180 D and 9 VAC 5-50-260)

7. **Fuel Specification** – The approved fuel for the diesel engines (Ref. Nos. 1 through 51 and Transitory Engines 1 through 6) is ultra low sulfur diesel fuel oil, and shall meet the specifications below:

ULTRA LOW SULFUR DIESEL FUEL OIL:

a. Does not exceed the American Society for Testing and Materials (ASTM) specification, D975 grade 2-D S15, or,

b. Has a maximum sulfur content not to exceed 0.0015% by weight (15 ppm), and either a minimum cetane number of forty or maximum aromatic content of 35 volume percent.

Exceedance of these specifications may be considered credible evidence of an exceedance of emission limits. A change in the fuel type or the fuel sulfur content may require a permit to modify and operate.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

8. **Fuel Certification** – The permittee shall obtain a certification from the fuel supplier with each shipment of diesel fuel oil. Each fuel supplier certification shall include the following:

a. The name of the fuel supplier;

b. The date on which the diesel fuel oil was received;

c. The quantity of diesel fuel oil delivered in the shipment;

d. A statement that the distillate oil complies with the requirements of Condition 7 Fuel Specification, or;

e. Alternately, the permittee shall obtain approval from the Regional Air Compliance Manager of the DEQ's NRO, if other documentation will be used to certify the diesel fuel oil type.

Fuel sampling and analysis, independent of that used for certification, as may be periodically required or conducted by DEQ may be used to determine compliance with the fuel specifications stipulated in Condition 7. Exceedance of these specifications may be considered credible evidence of the exceedance of emission limits.
(9 VAC 5-80-1180)

EMISSION LIMITS

9. **Process Emission Limits** – Emissions from the operation of the diesel engines (Ref. Nos. 1 through 51 and Transitory Engines 1 through 6) shall not exceed the limits specified below:

Ref. No. 1 (Caterpillar Model 3512C)	
Pollutant	**Emission Limit**
Nitrogen Oxides (as NO_2)	29.18 lbs/hr
Carbon Monoxide (CO)	3.98 lbs/hr
Volatile Organic Compounds (VOCs)	0.78 lbs/hr
Particulate Matter ($PM_{10}/PM_{2.5}$)	0.37 lbs/hr

Ref. Nos. 2 through 39 (Caterpillar Model 3516C-HD)	
Pollutant	**Emission Limit**
Nitrogen Oxides (as NO_2)	48.07 lbs/hr
Carbon Monoxide (CO)	6.01 lbs/hr
Volatile Organic Compounds (VOCs)	1.20 lbs/hr
Particulate Matter ($PM_{10}/PM_{2.5}$)	0.41 lbs/hr

Reference Nos. 40 through 51 and Transitory Engines 1 through 6 (Caterpillar Model 3516C)	
Pollutant	**Emission Limit**
Nitrogen Oxides (as NO_2)	38.85 lbs/hr
Carbon Monoxide (CO)	3.95 lbs/hr
Volatile Organic Compounds (VOCs)	1.13 lbs/hr
Particulate Matter ($PM_{10}/PM_{2.5}$)	0.57 lbs/hr

These emissions are derived from the manufacturer's "not to exceed" data at maximum design capacity of the engine-generator sets and operating limits to determine the overall emission contribution. Compliance with these pollutant limits shall be based on the proper operation and maintenance of the diesel engines or by testing, if required.
(9 VAC 5-80-1180 and 9 VAC 5-50-260)

10. **Annual Diesel Engines Emission Limits** – Total emissions from all diesel engines (Ref. Nos. 1 through 51 and Transitory Engines 1 through 6) shall not exceed the limits specified below:

Pollutant	Total
Nitrogen Oxides (as NO_2)	99.0 tons/yr
Carbon Monoxide (CO)	26.0 tons/yr
Volatile Organic Compounds (VOCs)	7.0 tons/yr
Particulate Matter ($PM_{10}/PM_{2.5}$)	2.0 tons/yr

These emissions are derived from the estimated overall emission contribution from operating limits. Compliance with these emission limits shall be determined by calculation methods as stated in Condition 11 or other means acceptable to DEQ.
(9 VAC 5-80-1180)

11. **Annual Emissions Calculations** – The total annual emissions of each regulated pollutant from the diesel engines (Ref. Nos. 1 through 51 and Transitory Engines 1 through 6) shall be calculated monthly as the sum of each consecutive twelve-month period. Refer to Condition 17 for record keeping requirements to demonstrate compliance with this condition.

    Monthly emissions for each pollutant shall be calculated using the following calculation method and applicable emission factor as listed in the tables below:

    a. Emission Factor Tables

    Table 1.A -

Reference No. 1 (Caterpillar Model 3512C)	
Pollutant	**Emission Factor (EF) (lb/gal)**
Nitrogen Oxides (as NO_2)	2.79×10^{-01}
Carbon Monoxide (CO)	1.94×10^{-01}
Volatile Organic Compounds (VOCs)	3.38×10^{-02}
Particulate Matter ($PM_{10}/PM_{2.5}$)	1.15×10^{-02}

    Table 1.B -

Reference Nos. 2 through 39 (Caterpillar Model 3516C-HD)	
Pollutant	**Emission Factor (EF) (lb/gal)**
Nitrogen Oxides (as NO_2)	2.99×10^{-01}
Carbon Monoxide (CO)	7.97×10^{-02}
Volatile Organic Compounds (VOCs)	2.26×10^{-02}
Particulate Matter ($PM_{10}/PM_{2.5}$)	9.90×10^{-03}

    Table 1.C -

Reference Nos. 40 through 51 and Transitory Engines 1 through 6 (Caterpillar Model 3516C)	
Pollutant	**Emission Factor (EF) (lb/gal)**
Nitrogen Oxides (as NO_2)	2.82×10^{-01}
Carbon Monoxide (CO)	1.50×10^{-01}
Volatile Organic Compounds (VOCs)	3.71×10^{-02}
Particulate Matter ($PM_{10}/PM_{2.5}$)	1.70×10^{-02}

    b. Emission Calculations: Monthly emissions for each pollutant listed in Condition 10 shall be calculated using the equations below and the appropriate emission factor from Tables 1.A through 1.C:

    NO_x*, CO, VOC, PM_{10} and $PM_{2.5}$ = {(Total fuel consumption for diesel engine (Ref. No. 1) x EF per Table 1.A) + (Total fuel consumption for diesel engines (Ref. Nos. 2 through 39) x EF per Table 1.B) + (Total fuel consumption for diesel engines (Ref. Nos. 40 through 51 and Transitory Engines 1 through 6) x EF per Table 1.C)} ÷ 2000 lbs/ton

* Upon DEQ verification of a DEQ approved performance test, the facility has the option of using a lower NOx (as NO2) emission rate (average of three one-hour test runs x 120%), by undergoing a permit amendment to incorporate the new lower rate.
(9 VAC 5-80-1180)

12. **Visible Emission Limit** – Visible emissions from each diesel engine (Ref. Nos. 1 through 51 and Transitory Engines 1 through 6) shall not exceed 5 percent opacity except during one six-minute period in any one hour in which visible emissions shall not exceed 10 percent opacity as determined by the EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during startup, shutdown, and malfunction.

    During start-up and shut-down times, visible emissions from the diesel engines (Ref. Nos. 1 through 51 and Transitory Engines 1 through 6) shall not exceed 10 percent except during one six-minute period in any one hour in which visible emissions shall not exceed 20 percent opacity as determined by the EPA Method 9 (reference 40 CFR 60, Appendix A).
    (9 VAC 5-80-1180, 9 VAC 5-50-260 and 9 VAC 5-170-160)

CONTINUING COMPLIANCE DETERMINATION

13. **Continuing Compliance Demonstration – Fuel Flow Measuring Device** – In accordance with the procedures outlined in the DEQ issued conditional approval letter dated April 29, 2014 (see Appendix A), or other means approved by the Regional Air Compliance Manager of the DEQ's Northern Regional Office, the permittee shall conduct periodic demonstrations to validate the continued accuracy of each fuel flow measuring device required by Condition 3.a.
    (9 VAC 5-80-1180)

14. **Stack Tests** – Upon request by the DEQ, the permittee shall conduct performance testing of the diesel engines (Ref. Nos. 1 through 51, and Transitory Engines 1 through 6) to demonstrate compliance with the emission limits contained in this permit. The details of the tests shall be arranged with the Regional Air Compliance Manager of the DEQ's NRO.
    (9 VAC 5-80-1200 and 9 VAC 5-50-30 G)

15. **Visible Emissions Evaluation** – Upon request by the DEQ, the permittee shall conduct visible emission evaluations of the diesel engines (Ref. Nos. 1 through 51, and Transitory Engines 1 through 6) to demonstrate compliance with the visible emission limits contained in this permit. The details of the VEE shall be arranged with the Regional Air Compliance Manager of the DEQ's NRO.
    (9 VAC 5-80-1200 and 9 VAC 5-50-30 G)

16. **Testing/Monitoring Ports** – The diesel engines (Ref. Nos. 1 through 51, and Transitory Engines 1 through 6) shall be constructed so as to allow for emissions testing upon reasonable notice at any time, using appropriate methods. Sampling ports shall be provided when requested at the appropriate locations in accordance with EPA Reference Method 1 (reference 40 CFR Part 60, Appendix A). In addition, safe sampling platforms and access shall be provided.
    (9 VAC 5-50-30 F and 9 VAC 5-80-1180)

These records shall be available for inspection by the DEQ and shall be current for the most recent five years, unless otherwise noted.
(9 VAC 5-80-1180 and 9 VAC 5-50-50)

NOTIFICATIONS

18. **Initial Notifications** – The permittee shall furnish written notification to the Regional Air Compliance Manager of the DEQ's NRO at the address listed below:

    Regional Air Compliance Manager
    Department of Environmental Quality
    13901 Crown Court
    Woodbridge, VA 22193

    a. The actual date on which construction of each diesel engine (Ref. Nos. 39 through 51) commenced within 30 days after such date. The notification must contain the following:

        i. Name and address of the permittee,
        ii. The address of the affected source,
        iii. Engine information including make, model, engine family, serial number, model year, maximum engine power and engine displacement.
        iv. Fuel used.

    b. The anticipated commencement date of the manufacturer's trials for each diesel engine (Ref. Nos. 39 through 51), postmarked not more than 30 days nor less than fifteen days prior to such date.

    c. The actual date on which the manufacturer's trials are completed for each diesel engine (Ref. Nos. 39 through 51) within 15 days after such date.

    d. The anticipated start-up date of each diesel engine (Ref. Nos. 39 through 51) postmarked not more than 60 days nor less than 30 days prior to such date.

    e. The actual start-up date of each diesel engine (Ref. Nos. 39 through 51) within 15 days after such date. The actual start-up date shall be the date on which each diesel engine completes manufacturer's trials, but shall be no later than 30 days after start-up for manufacturer's trials, unless otherwise approved by DEQ.

    (9 VAC 5-50-50 and 9 VAC 5-80-1180)

TRANSITORY DIESEL ENGINES

19. **Operation of the Transitory Diesel Engines** – The facility shall only operate the transitory diesel engines (Ref. Nos. Transitory Engines 1 through 6) in support of the facility such as servicing as back up during construction, commissioning, and maintenance of the engine-generator sets (Ref. Nos. 1 through 51).
    (9 VAC 5-80-1180)

RECORDS

17. **On Site Records** – The permittee shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the Regional Air Compliance Manager of the DEQ's NRO. These records shall include, but are not limited to:

    a. A monthly log of the monitoring device data required by Condition 4.

    b. A monthly summary table for each diesel engine (Ref. Nos. 1 through 51, and Transitory Engines 1 through 6) to include:

        i. Fuel consumption.
        ii. Hours of operation.
        iii. Annual fuel consumption, calculated monthly as the sum of each consecutive twelve month period.
        iv. Annual hours of operation, calculated monthly as the sum of each consecutive twelve month period.
        v. Reasons for operation (as defined in Condition 6).

    c. Monthly and annual emissions calculations for NO_X (as NO_2), CO, and VOC from the diesel engines (Ref. Nos. 1 through 51, and Transitory Engines 1 through 6) to verify compliance with the ton/yr emissions limitations in Condition 10. Monthly and annual emissions shall be calculated in accordance with Condition 11.

    d. All fuel supplier certifications.

    e. Results of all stack tests and visible emission evaluations.

    f. A copy of the maintenance schedule and records of scheduled and unscheduled maintenance in accordance with Condition 24.a.

    g. Operator training in accordance with Condition 24.d.

    h. Records of the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer.

    i. Records of changes in settings that are permitted by the manufacturer of the diesel engines.

    j. For engine-generator sets (Ref. Nos. 1 through 51, and Transitory Engine 1 through 6), maintain documentation from the manufacturer that the engine-generator sets are certified to meet the EPA's Tier 2 emission standards.

    k. Records of the results of the continued compliance demonstrations required by Condition 13 for each engine-generator set.

    Compliance for the consecutive twelve-month period referenced in Subsections b.iii., b.iv., and c. above shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding eleven months.

20. **Notifications** – The permittee shall furnish the following written notifications to the Regional Air Compliance Manager of the DEQ's NRO :

    a. The actual date and reason for each occurrence that each transitory diesel engine (Ref. Nos. Transitory Engine 1 through 6) was placed into service within 15 days after such date. The notification must include the following:

        i. Name and address of the permittee;
        ii. The address of the affected source;
        iii. Engine information including make, model, engine family, serial number, model year, maximum engine power and engine displacement;
        iv. Fuel used; and
        v. Hours operated.

    b. The actual date(s) of permanent shutdown and removal of each transitory diesel engine (Ref. Nos. Transitory Engine 1 through 6) within 15 days after such date.

    (9 VAC 5-80-1180)

GENERAL CONDITIONS

21. **Permit Invalidation** – This permit to construct the diesel engine-driven emergency generators (Ref. Nos. 39 through 51) shall become invalid, unless an extension is granted by the DEQ, if:

    a. A program of continuous construction or modification is not commenced within 18 months from the date of this permit.

    b. A program of construction is discontinued for a period of 18 months or more, or is not completed within a reasonable time.

    (9 VAC 5-80-1210)

22. **Permit Suspension/Revocation** – The Board may suspend or revoke any permit if the permittee:

    a. Knowingly makes material misstatements in the permit application or any amendments to it;

    b. Fails to comply with the terms or conditions of this permit;

    c. Fails to comply with any emission standards applicable to a permitted emissions unit,;

    d. Causes emissions from the stationary source which result in violations of, or interfere with the attainment and maintenance of, any ambient air quality standard; or fails to operate in conformance with any applicable control strategy, including any emission standards or emission limitations, in the implementation plan in effect at the time that an application is submitted; or

e. Fails to comply with the applicable provisions of 9 VAC 5-80-1100 et seq.

(9 VAC 5-80-1210 F and 9 VAC 5-80-1210 G)

23. **Right of Entry** – The permittee shall allow authorized local, state, and federal representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;

b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;

c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and

d. To sample or test at reasonable times. For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.

(9 VAC 5-170-130 and 9 VAC 5-80-1180)

24. **Maintenance/Operating Procedures** – At all times, including periods of start-up, shutdown, and malfunction, the permittee shall, to the extent practicable, maintain and operate the affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

The permittee shall take measures in order to minimize the duration and frequency of excess emissions, including the following:

a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.

b. Maintain an inventory of spare parts.

c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.

d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures, prior to their first operation of such equipment. The permittee shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

Records of maintenance shall be maintained on site for a period of 5 years and shall be made available to DEQ personnel upon request.
(9 VAC 5-50-20 E and 9 VAC 5-80-1180 D)

25. **Record of Malfunctions** – The permittee shall maintain records of the occurrence and duration of any bypass, malfunction, shut-down or failure of the facility or its associated air pollution control equipment that results in excess emissions for more than one hour. The records shall be maintained in a form suitable for inspection and maintained for at least two years (unless a longer period is specified in the applicable emission standard) following the date of occurrence. Records shall include the date, time, duration, description (emission unit, pollutant affected, cause of malfunction), corrective action, preventive measures taken and name of person generating the record.
(9VAC 5-20-180 J and 9 VAC 5-80-1180 D)

26. **Notification for Facility or Control Equipment Malfunction** – The permittee shall furnish notification to the regional Air Compliance Manager of the DEQ's NRO, of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone, telegraph, or electronic communication. Such notification shall be made as soon as practicable but no later than four daytime business hours after the malfunction is discovered. The permittee shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within two weeks of discovery of the malfunction. When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the permittee shall notify the Regional Air Compliance Manager of the DEQ's NRO.
(9 VAC 5-20-180 C and 9 VAC 5-80-1180)

27. **Violation of Ambient Air Quality Standard** – Regardless of any other provision of this permit, the permittee shall, upon request of the DEQ, reduce the level of operation of the facility if the DEQ determines that is necessary to prevent a violation of any primary ambient air quality standard. Under worst case conditions, the DEQ may order that the permittee shut down the facility, if there is no other method of operation to avoid a violation of the ambient air quality standard. The DEQ reserves the right to prescribe the method of determining if a facility will cause such a violation. In such cases, the facility shall not be returned to operation until it and the associated air pollution control equipment are able to operate without violation of any primary ambient air quality standard.
(9 VAC 5-20-180 I and 9 VAC 5-80-1180)

28. **Change of Ownership** – In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the Regional Air Compliance Manager of the DEQ's NRO of the change of ownership within 30 days of the transfer.
(9 VAC 5-80-1240)

29. **Permit Copy** – The permittee shall keep a copy of this permit on the premises of the facility to which it applies.
(9 VAC 5-80-1180)

Appendix A – Conditional Approval Letter

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

April 29, 2014

Malcolm Gander, Ph.D.
Manager, Environmental Regulatory Compliance
Data Center Engineering
Amazon Web Services
1918 8th Avenue, 25th Floor
Seattle, WA 98101

Dear Mr. Gander:

Thank you for your e-mail dated April 16, 2014, and your proposal on how to verify the accuracy of the fuel consumption data displayed on the Engine Control Modules (ECMsyou're your diesel engines. As I stated in our meeting April 9, 2014, the Virginia Department of Environmental Quality believes that refilling diesel fuel tanks, using delivery trucks equipped with calibrated, certified fuel meters, offers a cost effective and accurate means of verifying the accuracy of ECM fuel consumption data over years of engine operation. We appreciate that you and John Fuoto, your environmental consultant, concur with this approach.

In the attached procedure and data collection sheet, we have incorporated the testing procedures described in your April 16, 2014, proposal and added a few additional requirements. I think you will find the procedure closely follows what you proposed. One change I would like to draw your attention to, is the new requirement that an engine to consume 20 percent (not 10 percent) of the fuel in the base tank over the test period. As Mr. Fuoto has pointed out, in large flat tanks, significant fuel consumption may result in only a small drop in the level of fuel in a tank. We believe a 20 percent drop in fuel volume will produce good fuel consumption comparisons and minimize relative error.

Please review the attachments and provide us with your comments.

You may contact me at R.David.Hartshorn@deq.virginia.gov or (703) 583-3895 if you have questions or need additional information.

Sincerely,

R. David Hartshorn
Air Compliance Manager

cc William G. Gillespie, Air Quality Specialist
Justin Wilkinson, Air Permit Writer

Procedure for Verifying the Accuracy of Fuel Consumption Information Displayed on the Engine Control Modules (ECMs) of Diesel Engines

April 28, 2014

1.0 Purpose

This procedure provides a means of assessing the accuracy of the fuel consumption information displayed on the Engine Control Modules (ECMs) of diesel engines.

2.0 Summary of the Method

This method measures fuel consumption of a diesel engine by two methods and compares the fuel consumption measurements. Fuel consumption measured by the ECM, is determined by recording the fuel consumption displayed on the ECM when the engine's fuel tank is full and then recording the fuel consumption displayed on the ECM at a later date after the engine has been run a significant period of time. The difference between the two ECM fuel consumption values is a measure of the fuel consumed over the test period. During the test period, fuel consumption of the diesel engine is also measured by filling the fuel tank of the engine to an accurately measured reference point at the beginning of the test period. At the end of the test period, the tank is refilled to the reference point. The amount of fuel used to refill the engine's fuel tank is a measure of the fuel consumed during the test period.

3.0 Measurement Considerations

The following information should be considered when making fuel measurements.

- The rectangular fuel tanks under many diesel engine generators vary in size but are often approximately 30 feet long, 10 feet wide, and 15 - 20 inches high. Given the flat shape of the tanks, a relatively small drop in fuel level in the tank may correspond to a fairly large volume of fuel consumed. In some tanks, a one inch change in fuel height may correspond to 150 to 200 gallons of fuel consumed.
- The relationship between the drop in fuel height in an engine fuel tank and the gallons of fuel consumed by the engine ("the gallons per inch") is not known with sufficient accuracy for many fuel tank configurations.
- Emergency diesel engine generators may be operated infrequently, some as little as ten minutes per week. These short weekly "exercise" periods, when engines operate at minimum load, result in very low fuel consumption rates. Fuel consumption comparisons may need to be done over several months or longer if the engine is only operated during weekly exercise periods.
- The configuration of some facilities may not easily allow for straight-forward use of a load bank to allow an engine to be operated at increased load and an increased fuel consumption rate to achieve large fuel level changes.
- If the engines have been run at higher loads so that a tank fill-up is required, then there should be enough change in fuel volume to make a reliable comparison between the two measurement methods. Engines may be operated a significant loads and for periods longer than 10 minutes during periods such as transformer maintenance, for example.

- Fuel transfers from on-site Above-Ground Storage Tanks (ASTs) to engine base tanks are typically not sufficiently accurate to be used in measuring engine fuel consumption. Fuel transfers from AST to engine base tanks use on-site pumps and flow meters that are not calibrated.
- Only fresh or "polished" fuel can be used for the period of comparison to assure that the fuel properties are those required to assure that the fuel injectors perform as they are designed.

4.0 Number and Type of Engines Tested

Perform ECM verification tests on 25 percent of the engines at each facility. Of the permitted engines, select at least one of each engine make, model and horsepower rating.

5.0 Fuel Consumption Tracking

5.1 Fuel Consumption Tracking for Engines with ECMs that Display Fuel Consumed

To measure fuel consumption, collect the following information and report it on the attached Fuel Consumption Data Sheet.

- Fill the engine's fuel tank from a delivery truck.
- Measure the fuel height in the engine's fuel tank. Record this height in inches. Ensure the fill height is easily measured and easily measured when a future fuel delivery is made.
- Record the "gallons of fuel combusted" displayed on the engine ECM.
- Run the engine until 20 percent of fuel in the fuel tank (or more) has been consumed.
- Refill the engine's fuel tank from a delivery truck with a certified Vehicle Tank Meter (VTM).
- Record the gallons of fuel consumed as displayed on the ECM.

The refill amount will represent the amount of fuel consumed since the previous fuel delivery. Compare VTM measured volume with the volume calculated from the ECM display (ending ECM value minus starting ECM value).

VTMs must be certified by the Virginia Department of Agriculture and Consumer Services (VDACS) every two years. For best results, DEQ recommends that facilities use VTMs that have been certified within six months of the fuel tank refill. Contact John Kirk at VDACS at (804) 786-2476 or John.Kirk@vdacs.virginia.gov more information on VTM certifications.

5.2 Fuel Consumption Tracking for Engines without ECMs that Display Fuel Consumed

Track engine fuel consumption by tracking fuel deliveries to the engine. Compare fuel consumption as measured by fuel deliveries to fuel consumption estimates computed from engine hour, percent load and manufacturer fuel consumption data.

Fuel Consumption Data Collection Sheet

Facility and Engine-Generator Information

Facility Name: _____

Facility Registration Number: _____

Engine-Generator ID: _____

Engine Information:

- Make and Model: _____
- Engine Model Year: _____
- Engine Serial Number: _____
- Engine Control Module (ECM) Version: _____

Engine Control Module (ECM) Data

1. Initial ECM Readings:
   - Date: _____
   - Time: _____
   - Engine Fuel Consumption Total (gallons): _____
   - Engine Operating Hours (hours): _____
   - Technician's Name: _____
2. Final ECM Readings:
   - Date: _____
   - Time: _____
   - Engine Fuel Consumption Total (gallons): _____
   - Engine Operating Hours (hours): _____
   - Technician's Name: _____
3. Calculated Values:
   - Fuel Consumed Over the Test Period (final ECM gallons minus initial ECM gallons): _____
   - Hours Operated (final ECM hours minus initial ECM hours): _____

Fuel Tank Measurements

1. Initial Fuel Height Measurement:
   - Date: _____
   - Time: _____
   - Fuel height (inches): _____
   - Technician's Name: _____

2. Final Fuel Height Measurement:

- Date: _____
- Time: _____
- Fuel height (inches): _____
- Technician's Name: _____

Note: The initial and final fuel height measurements must be the same.

3. Volume of fuel required to return the fuel level to the initial fuel level (gallons): _____

Was the fuel tank refilled from a fuel truck equipped with a calibrated Vehicle Tank Meter (VTM)? Circle one.

Yes No **If No, the fuel consumption comparison is invalid.**

4. Fuel Tickets and VTM Certification

Attach a copy of the fuel delivery ticket and the fuel truck's Vehicle Tank Meter certification. The fuel delivery ticket must show the name, address and phone number of the fuel delivery company and the volume of fuel delivered.