STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF APPROVING A NEW)
AIR CONTAMINANT SOURCE FOR) Approval Order No. 15AQ-E616
RS TITAN, LLC, TITAN DATA CENTER)

TO: Lee Durbin
RS Titan, LLC
999 North Sepulveda Blvd, Suite 600
El Segundo, CA 90245

EQUIPMENT

Table 1: 2.0 to 2.5 MW Engine & Generator Serial Numbers					
Project	Unit ID	Capacity MWe	Engine SN	Generator SN	Engine date
Phase 1	1	2.0	33182862	J100162676	9/09/10
"	2	2.0	33182818	J100162677	9/07/10
Phase 2	3	2.0			
"	4	2.0			
Phase 3	5	2.0			
Phase 4	6	2.5			
"	7	2.5			
"	8	2.5			
"	9	2.5			
"	10	2.5			
total	10	22.5			

There was no other project equipment other than the generator engines that required review under the state and federal air quality requirements.

DETERMINATIONS

In relation to the above equipment and the evaluation outlined in the Technical Support Document associated with this Order, the Department of Ecology, State of Washington, pursuant to Revised Code of Washington (RCW) 70.94.152, and WAC 173-400-110, and WAC 173-460-040, makes the following determinations:

- The proposed project, if constructed and operated as herein required, will be in accordance with applicable rules and regulations, as set forth in Chapter 173-400 WAC, and Chapter 173-460 WAC, and the operation thereof, at the locations proposed, will not result in ambient air quality standards being exceeded.
- The proposed projects, if constructed and operated as herein required, will provide all known, available, and reasonable methods of emission control.

THEREFORE, IT IS ORDERED that the project as described in the Notice of Construction application and more specifically detailed in plans, specifications and other information submitted to Ecology is approved for construction and operation, provided the following conditions are met:

APPROVAL CONDITIONS

1. ADMINISTRATIVE CONDITIONS

1.1 Notice of Construction Approval Order No. 14AQ-E582 was issued to RS Manager Data Center (fka ASK.com) on October 29, 2014. It was determined that, upon review of the Titan Data Center expansion project, the emissions from RS Manager Data Center shall not be aggregated with emissions from the Titan Data Center to determine potential to emit or Air Operating Permit applicability. RS Manager Data Center and the Titan Data Center, although co-located in the same building, are not considered a single "source" as defined in WAC 173-400-030(76).

1.2 Upon issuance of this Approval, Order No. 13AQ-E491 is rescinded and replaced by the terms and conditions of this Approval.

2. EQUIPMENT RESTRICTIONS

2.1 The 5 Cummins Model QSK78 2.5 MWe engines and 5 Model QSK60 2.0 MWe used to power the electrical generators shall be warranted by the manufacturer and certified by the Environmental Protection Agency (EPA) to meet 40 CFR 89 Tier II emission levels or other specifications as required by the EPA at the time the engines are manufactured and installed.

2.2 The only Cummins Model QSK78 and QSK60 engines and electrical generating units approved for installation and operation at the Titan Data Center, are those listed in Equipment Table 1, once all Phases have been completed.

2.3 Replacement of failed engines with identical engines (same manufacturer and model) requires notification prior to installation, but will not require Notice of Construction unless there is an emission rate increase from the replacement engines.

2.4 The ten Model QSK78 and QSK60 engine exhaust stack heights shall be greater than or equal to 32.8 feet above ground level as described in the NOC application.

2.5 Manufacture and installation of the first 2 of 10 engine/generator sets proposed for Phase 1 of the project occurred during 2011. The manufacture and installation of the next 2 engine/generator sets proposed for Phase 2 of the project shall occur in 2015. Another engine/generator set proposed for Phase 3 of the project shall occur by the end of 2017. The final 5 engine/generator sets proposed for Phase 4 shall occur by the end of 2018. If the manufacture and installation of these engines has not been completed within the above schedule, a NOC application may be required prior to installation.

2.6 This Order only applies to the 5 Cummins Model QSK78 2.5 eMW engines and 5 Model QSK60 2.0 eMW engines that were evaluated in the Notice of Construction application. A new NOC application may be required to install any engines other than the 5 Cummins Model QSK78 2.5 eMW engines and 5 Model QSK60 2.0 eMW engines.

3. OPERATING LIMITATIONS

3.1 The fuel consumption at the Titan Data Center facility shall be limited to a total of 49,400 gallons per year of diesel fuel equivalent to on-road specification No. 2 distillate fuel oil (less than 0.00150 weight percent sulfur). Total annual fuel consumption by the facility may be averaged over a three (3) year period using monthly rolling totals. The total annual facility fuel consumption limit does not include the fuel allocated to RS Manager Data Center in Order No. 14AQ-E582.

3.2 The ten (10) Titan Data Center engines are limited to the following average hours of specific operating activities (excluding initial start-up and commissioning, see Approval Condition 3.8), fuel limit, load, and number of engines operating concurrently:

Table 3.2: Operating Restrictions for the 10 new engines

Operating Activity	Average hours/year per generator	Average Operating Load (%)	Maximum Diesel Fuel Gallons/year	Maximum # Operating Concurrently
Maintenance Testing	13	no load		2
Load Testing quarterly	3	50%		1
Load Testing annual	4	100%		1
Electrical Bypass[3]	20	59%[1] and 64%[2]		5
Unscheduled Testing	10	25% to 100%		1
Power Outage	8	59%[1] to 64%[2]		10
Total	58		49,400	

[1]Operating load for the 5 expansion QSK78 engines.

[2]Operating load for the 5 expansion QSK60 engines.

[3]Defined in Approval Condition 3.7.

3.3 Each of the 10 Model QSK78 and QSK60 engines shall not operate during a power outage more than 8 hours per year averaged over 3 consecutive years at the average loads specified above in Table 3.2.

3.4 Operation of the 10 Model QSK78 and QSK60 engines for required monthly maintenance testing shall be limited to an average of 13 hours per year, each averaged over 3 consecutive years, at no load. Testing will involve one engine at a time.

3.5 Operation of the 10 Model QSK78 and QSK60 engines for annual load bank testing shall be limited to an average of 4 hours per year, each averaged over 3 consecutive years, at an approximate electrical load of 100% of the standby rating. Testing will involve one engine at a time.

3.6 Operation of the 10 Model QSK78 and QSK60 engines for quarterly load bank testing shall be limited to an average of 3 hours per year, each averaged over 3 consecutive years, at an approximate electrical load of 50% of the standby rating. Testing will involve one engine at a time.

3.7 Operation of the 10 Model QSK78 and QSK60 engines for electrical bypass operations that includes main switchgear and transformer maintenance, and unscheduled engine testing, shall be limited to an average of 30 hours per year each averaged over 3 consecutive years at the average loads specified above in Table 3.2. Electrical bypass

operations will involve no more than five engines at a time. Unscheduled testing will involve no more than one engine at a time.

3.8 The ten (10) Titan Data Center generator engines require scheduled maintenance testing each month. To mitigate engine emission impacts, Titan Data Center engines will perform all scheduled maintenance testing, scheduled bypass operations, and load testing during daylight hours. The Titan Data Center shall develop a maintenance plan for scheduled testing operations, and that schedule shall be available for review by Ecology upon request. Changes to the maintenance plan will not trigger revision or amendment of this Order as long as the engines operating concurrently do not exceed limits contained in Table 3.2.

3.9 Initial start-up (commissioning) testing of each of the ten (10) Model QSK78 and QSK60 engines at the Titan Data Center is restricted to an average of 30 hours per generator, at an average fuel usage of 2309 gallons per generator, averaged over all generators installed during any consecutive 3 year period.

3.9.1 Except during site integration testing as specified below, only one engine shall be operated at any one time during start-up testing.

3.9.2 During site integration testing, up to 2 generator engines may operate concurrently for up to eight (8) hours.

3.9.3 All startup and commissioning testing shall be conducted during daylight hours.

3.9.4 Emission limits contained in Approval Conditions 5 remain in effect during initial start-up and commissioning testing.

4. GENERAL EXHAUST STACK TESTING and MONITORING REQUIREMENTS

4.1 The Titan Data Center will follow engine-manufacturer's recommended diagnostic testing and maintenance procedures to ensure that each of the ten QSK78 and QSK60 engines will conform to 40 CFR 89 emission specifications throughout the life of each engine.

4.2 Initial performance and periodic emission testing performed to verify conditions of this Approval Order or for submittal to Ecology in support of this facility's operations shall be conducted as required in 40 CFR 60.8, excepting 60.8(a).

4.3 Final test reports shall be submitted to Ecology within 60 days of completion of the test.

4.4 Initial and periodic performance engine exhaust stack testing shall be conducted as follows:

4.4.1 Initial performance testing will occur within 12 months of installation of any new tenant engines approved in this Order. The Titan Data Center shall measure concentrations of nitric oxide (NO), nitrogen dioxide (NO_2), total nitrogen oxides (NOx), and DEEP leaving that engine's exhaust stack in accordance with Approval Condition 4.5. At least one engine of each model will be tested when multiple engines are installed. This testing will serve to demonstrate compliance with the emission limits contained in Approval Conditions 5.2, 5.3, and 5.5. The engines to be tested will be included in the test plan, and are subject to Ecology approval.

4.4.2 Periodic testing shall be conducted every 60 months after initial performance testing as required in 4.4.1. Testing shall be conducted on at least one engine of each model when multiple engines are installed at the same time. The engines to be tested will be included in the test plan, and are subject to Ecology approval.

4.5 The following procedures shall be used to measure nitric oxide, nitrogen dioxide, total nitrogen oxides (NOx), and DEEP emissions for engines required by Approval Condition 4.4 to have exhaust stack testing.

4.5.1 Initial emissions exhaust stack testing should be combined with start-up testing or be combined with pre-scheduled monthly maintenance and annual load bank engine testing. Additional operation of the engines for the purpose of initial performance emissions testing beyond the operating hours allowed in this Order may be requested and approved in writing by Ecology.

4.5.2 Initial and periodic performance testing for nitric oxide, nitrogen dioxide, and total nitrogen oxides (NOx), and DEEP from the QSK78 and the QSK60 engines shall be conducted using EPA 40 CFR 60 Reference Methods 5 and 7E, or other EPA reference test methods as approved or required by Ecology.

4.5.3 Initial and periodic performance testing emission measurements shall be conducted for the QSK78 engines at 100%, 64%, and no load and the QSK60 engines at 100%, 59%, and no load. The purpose of initial and periodic performance testing is to verify modeled emission rates.

4.5.4 The F-factor method, as described in EPA Method 19, may be used to calculate exhaust flow rate through the exhaust stack. The fuel meter data, as measured according to Approval Condition 4.7, shall be included in the test report, along with the emissions calculations.

4.5.5 Titan may request in writing changes to testing requirements. Approval to either relax or modify exhaust stack engine testing must be received in writing from Ecology, and will not require revision of this Order. This includes substituting stack testing to verify compliance with EPA Tier 2 emission limits contained in Approval Condition 5.1.

4.6 Each engine shall be equipped with a properly installed and maintained non-resettable meter that records total operating hours.

4.7 Each engine shall be connected to a properly installed and maintained fuel flow monitoring system that records the amount of fuel consumed by that engine during each operation.

5. EMISSION LIMITS

The 10 new Model QSK78 and QSK60 engines shall meet the following average emission rate limitations and conditions:

5.1 If required to demonstrate compliance with the g/kW-hr EPA Tier 2 average emission limits through exhaust stack testing, the Titan Data Center shall average criteria pollutant emission rates for 5 individual operating loads (10%, 25%, 50%, 75%, and 100%) according to 40 CFR §89.410 and Table 2 of Appendix B to 40 CFR Part 89, Subpart E. Verification of EPA Tier 2 compliance may be required, or may be

substituted with written Ecology approval, for testing at specific loads as required in Approval Conditions 4.4.1, 4.5, 4.5.2, and 4.5.3.

5.2 Nitrogen dioxide (NO_2) emissions from each of the 10 expansion project engines shall not exceed the following emission rates at the stated loads, based on emission factors provided by the engine manufacturer and performance testing data:

Table 5.2: Nitrogen Dioxide (NO_2) emission rate limits

	Operating Load	QSK60 2000 kWe	QSK78 2500 kWe
5.2.1	100%	4.5 lbs/hr	6.2 lbs/hr
5.2.2	64%	2.6 lbs/hr	na
5.2.3	59%	na	2.6 lbs/hr
5.2.4	No load	1.1 lbs/hr	1.35 lbs/hr

5.3 Nitrogen Oxide (NOx) emissions from each of the 10 expansion project engines shall not exceed the following emission rates at the stated loads, based on emission factors provided by the engine manufacturer and performance testing data:

Table 5.3: Nitrogen Oxide (NOx) emission rate limits

	Operating Load	QSK60 2000 kWe	QSK78 2500 kWe
5.3.1	100%	45 lbs/hr	62 lbs/hr
5.3.2	64%	26 lbs/hr	na
5.3.3	59%	na	26 lbs/hr
5.3.4	No load	4.3 lbs/hr	5.4 lbs/hr

5.4 Carbon Monoxide emissions from all 10 engines combined shall not exceed 94 pounds per hour and 3.4 tons per year.

5.5 Diesel Engine Exhaust Particulate emissions from each of the 10 expansion project engines shall not exceed the following emission rates at the stated loads, based on emission factors provided by the engine manufacturer and performance testing data. All DEEP emissions shall be considered PM_{10} and $PM_{2.5}$ emissions for verification of the National Ambient Air Quality Standard.

Table 5.5: Diesel Engine Exhaust Particulate (DEEP) emission rate limits

	Operating Load	QSK60 2000 kWe	QSK78 2500 kWe
5.5.1	100%	1.0 lbs/hr	1.2 lbs/hr
5.5.2	64%	0.61 lbs/hr	na
5.5.3	59%	na	0.70 lbs/hr
5.5.4	No load	0.05 lbs/hr	0.06 lbs/hr

5.6 Diesel Engine Exhaust Particulate (DEEP) emissions from all 10 engines combined shall not exceed 0.19 tons/yr.

5.7 Nitrogen dioxide emissions from all 10 engines combined shall not exceed 7.9 tons per year.

5.8 Volatile Organic Carbon emissions from all 10 engines combined shall not exceed 0.56 tons per year.

5.9 Visual emissions from each diesel electric generator exhaust stack shall be no more than 5 percent, with the exception of a ten (10) minute period after unit start-up. Visual emissions shall be measured by using the procedures contained in 40 CFR 60, Appendix A, Method 9.

5.10 Sulfur dioxide emissions from all 10 engines combined shall not exceed 0.006 tons per year.

6. OPERATION AND MAINTENANCE MANUALS

A site-specific O&M manual for the Titan Data Center facility equipment shall be developed and followed. Manufacturer's operating instructions and design specifications for the engines, generators, cooling towers, and associated equipment shall be included in the manual. The O&M manual shall be updated to reflect any modifications of the equipment or its operating procedures. Emissions that result from failure to follow the operating procedures contained in the O&M manual or manufacturer's operating instructions may be considered proof that the equipment was not properly installed, operated, and/or maintained. The O&M manual for the diesel engines and associated equipment shall at a minimum include:

6.1 Manufacturer's testing and maintenance procedures that will ensure that each individual engine will conform to the EPA Tiered Emission Standards appropriate for that engine throughout the life of the engine.

6.2 Normal operating parameters and design specifications.

6.3 Operating maintenance schedule.

7. SUBMITTALS

All notifications, reports, and other submittals shall be sent to:

Washington State Department of Ecology
Air Quality Program
4601Monroe Street
Spokane, WA 99205-1295

8. RECORDKEEPING

All records, Operations and Maintenance Manual, and procedures developed under this Order, shall be organized in a readily accessible manner and cover a minimum of the most recent 60-month period. The following records are required to be collected and maintained:

8.1 Fuel receipts with amount of diesel and sulfur content for each delivery to the facility.

8.2 Monthly and annual hours of operation for each diesel engine, including reasons for each type of operation.

8.3 Annual number of engine start-ups, purpose of each engine start-up, load, and duration for each diesel engine period of operation.

8.4 Annual gross power generated.

8.5 Upset condition log for each engine and generator that includes date, time, duration of upset, cause, and corrective action.

8.6 Recordkeeping required by 40 CFR Part 60 Subpart IIII.

8.7 Air quality complaints received from the public or other entity, and the affected emissions units.

9. REPORTING

9.1 Within 10 business days after entering into a binding agreement to purchase the Phase 2 through Phase 4 engine/generator sets identified in Equipment Table 1.1, the Titan Data Center shall notify Ecology in writing. The serial number of the engine and the generator, and the engine build date will be submitted prior to installation of each Phase 1 through 4 engines.

9.2 The following information will be submitted to the AQP at the address in Condition 7 above by January 31 of each calendar year. This information may be submitted with annual emissions information requested by the AQP.

9.2.1 Monthly rolling annual total summary of estimated air contaminant emissions, monthly rolling hours of operation with annual total, and monthly rolling gross power generation with annual total.

9.2.2 Written notification that the O&M manual has been developed and updated within 60 days after the issuance of this Order.

9.2.3 RS Titan will use emission factors as contained in the permit to calculate annual emissions until initial performance testing provides more accurate data.

9.3 Any air quality complaints resulting from operation of the emission units or activities shall be promptly assessed and addressed. A record shall be maintained of Titan's action to investigate the validity of the complaint and what, if any, corrective action was taken in response to the complaint. Ecology shall be notified within three (3) days of receipt of any such complaint.

9.4 Titan shall notify Ecology by e-mail or in writing within 24 hours of any engine operation of greater than 60 minutes if such engine operation occurs as the result of a power outage. This notification does not alleviate Titan from annual reporting of operations contained in any section of Approval Condition 9.

10 GENERAL CONDITIONS

10.1 **Visible Emissions** - No visible emissions shall be allowed beyond the property line, as determined by opacity readings.

10.2 **Commencing/Discontinuing Construction and/or Operations** - This Approval Order shall become void if construction is not commenced within eighteen (18) months following the date of this Approval Order, or if construction is discontinued for a period of eighteen (18) months.

10.3 **Compliance Assurance Access** - Access to the source by EPA or Ecology shall be allowed for the purposes of compliance assurance inspections. Failure to allow access is grounds for revocation of this Approval Order and enforcement under applicable regulations.

10.4 **Availability of this Approval Order** - Legible copies of the Order approving the NOC application shall be available to employees in direct operation of the facility and be available for review upon request by Ecology.

10.5 **Equipment Operation** - Operation of the facility shall be conducted in compliance with all data and specifications submitted as part of the NOC application and in accordance with the FDCP and O&M manual.

10.6 **Activities Inconsistent with this Approval Order** - Any activity undertaken by the permittee or others, in a manner that is inconsistent with information in the NOC application or this Approval Order, shall be subject to Ecology enforcement under applicable regulations.

10.7 **Obligations under Other Laws or Regulations** - This Approval Order shall not be construed to relieve the permittee of its obligations under any local, state or federal laws or regulations.

10.8 Authorization may be modified, suspended, or revoked in whole or part for cause including, but not limited to, the following:

10.8.1 Violation of any terms or conditions of this authorization;
10.8.2 Obtaining this authorization by misrepresentation or failure to disclose fully all relevant facts.

All plans, specifications, and other information submitted to Ecology relative to this project and further documents and any further authorizations or approvals or denials in relation thereto, shall be kept at the Eastern Regional Office of the Department of Ecology in the "Air Quality Controlled Source" files and by such action shall be incorporated herein and made a part hereof.

The provisions of this authorization are severable and, if any provision of this authorization, or application of any provisions of this authorization to any circumstance, is held invalid, the application of such provision to their circumstances, and the remainder of this authorization, shall not be affected thereby.

YOUR RIGHT TO APPEAL

You have a right to appeal this Approval Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Approval Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of this Approval Order:

- File your appeal and a copy of this Approval Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Approval Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

APPEAL ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 1111 Israel RD SW STE 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

For additional information visit the Environmental Hearings Office Website: http://www.eho.wa.gov

To find laws and agency rules visit the Washington State Legislature Website: http://www1.leg.wa.gov/CodeReviser

DATED at Spokane, Washington this 20th day of May, 2015.

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