

**Technical Support Document for
 Notice of Construction No. 08AQ-C078 Second Revision
 VMware, Inc.
 Four Generators @ East Wenatchee, Washington**

Prepared by: Lynnette Haller, PE, as of 5-20-13

1. Project Summary

Add four new generators for VMware pods 1 & 3, at the existing Columbia Data Center. As originally permitted, in 2008, the project was to consist of 16 identical generators. At that time a second tier toxics analysis was performed, for nitric oxide. A permit revision was completed, in 2010, resulting in a reduction in the number of allowed generators, to ten. This resulted in a corresponding reduction in potential annual emissions and fuel use.

The facility currently consists of six installed units. VMware would now like to install the final four generators. The construction time, as allowed by the previous permits, has expired. Thus, the four generators are considered a new source and are subject to full permit review. Since 2008, the list of TAPs was revised. Nitric oxide is no longer a TAP. However, a new TAP, Diesel Engine Exhaust Particulate (DEEP), will be emitted and trigger a second tier toxics review.

Ecology has determined that this project meets all of the requirements specified in WAC 173-400-113 and WAC 173-400-040, and thus I recommend that Ecology approve this project as proposed and conditioned in *Order No. 08AQ-C078 Second Revision*.

2. Application Processing

Timeliness

Application Received (date)	Initial Completeness Determination (date)	# of days from App Received to Initial Completeness Determination (target = 30)	Complete Application Received (date)	Draft Permit Proposed (date)	# of days from Complete Application to Draft Permit (target = 60)	Public Comment Period closed (date)	Date Final Decision issued	# of days from complete application received to final decision issued (target = 60)	Start to finish - Total days from application in to final decision out
2-27-13	3-6-13	7	4-11-13						

This application was received by fiscal, on 1-22-13.

Public Notice
(Not yet completed.)

Fees

The fee for this action is \$1,500 (Basic Project) + \$95/hr (after 16 hrs). Ecology received payment of the \$1,500, on 2-28-13. I spent hours *(to be quantified prior to issuance of final determination)* on this permit action. No additional fee is due.

SEPA

Douglas County issued a DNS for this project on 4-24-08.

Applicant Review

The applicant was provided the opportunity to do a factual review of the *Proposed Decision* and *Technical Support Document*, on 5-10-13. The applicant provided a few comments/requests.

3. Emissions

Allowable emissions resulting from this project are summarized herein.

Pollutant	Emissions			
	6 Existing Generators	4 New Generators	Total	
Nitrogen Oxides (NO _x)	6.85	6.04	12.89	Tons per year
Carbon Monoxide (CO)	4.11	0.54	4.65	Tons per year
Sulfur Oxides (SO ₂)	0.0073	0.0042	0.0115	Tons per year
Particulate Matter (PM ₁₀ =PM _{2.5} =DEEP)	0.23	0.143	0.37	Tons per year
Volatile Organic Compounds (VOC)	0.32	0.20	0.52	Tons per year
Toxic Air Pollutants (TAPs)	See 4-23-13 LAH revisions	See Table 5 of 4-10-13 application		

Existing generator emission estimates are based upon revisions made by LAH on 4-23-13, to Table 2 as originally submitted by Jim Wilder as an attachment to 6-30-08 email.

New generator emission estimates taken from Table 5 of *Final Report Notice of Construction Application Supporting Documentation Four New Generators at VMware Pods 1 and 3*, dated 3-6-13, and updated 4-10-13.

Note that while the proposed generators will be identical to the existing ones, the emission factors used to evaluate the impacts of the four new generators differ (both higher and lower, depending on the pollutant) from those used for when evaluating the existing generators.

4. Applicable Regulations

The generators are subject to 40 CFR Part 60 Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Ecology adopted this rule. The Standards include: notifications, maintenance, recordkeeping and reporting.

The generators are subject to the RICE NESHAP (40 CFR Part 63 Subpart ZZZZ). Ecology adopted this rule. However, per 63.6590(c)(1), the generator engines must only meet the requirements of 40 CR Part 60 Subpart IIII. No further requirements apply under the Subpart ZZZZ.

As required by WAC 173-400-113(1), the proposed new source, and all of its emission units, will comply with all applicable new source performance standards, national emission standards for hazardous air pollutants, national emission standards for hazardous air pollutants for source categories, and emission standards adopted under chapter 70.94 RCW.

5. BACT/t-BACT

The *Final Report Notice of Construction Application Supporting Documentation Four New Generators at VMware Pods 1 and 3*, dated 4-10-13, includes a discussion of BACT/t-BACT, in Section 4.0. Such discussion includes review of several add on controls. In this discussion, all add on controls are dismissed from further consideration on the basis that they are too costly to impose.

BACT/t-BACT is site specific and project specific determination. Ecology does not have set cost criteria, and thus I do not agree that the applicant's cost thresholds dictate this determination, I do agree that the costs would be unreasonably high to employ any of the reviewed add on controls, on this project, at this location. Ecology has recently made similar determinations for several nearby data centers, with higher impacts and lower costs.

As required by WAC 173-400-113(2) and WAC 173-460-040(3)(a), I agree the proposed new source will employ BACT/t-BACT for all pollutants, by use of properly operated and maintained Tier 2 engines, utilizing ultra-low sulfur diesel fuel.

6. Ambient Air Quality Standards

The *Final Report Notice of Construction Application Supporting Documentation Four New Generators at VMware Pods 1 and 3*, dated 3-6-13, and updated 4-10-13, includes a discussion of the air quality impact analysis, including AERMOD dispersion modeling, in Section 5.0. Clint Bowman reviewed the AERMOD modeling, reporting in a 3-29-13 email that, “[u]nless there are changes to the emissions you may accept the results of the air quality analysis in the 6 March 2013 application submitted by VMware for expansion of their East Wenatchee, WA facility.”

All criteria pollutant impacts were modeled to show compliance with their respective NAAQS and WAAQS.

All quantified TAPs, except NO₂, DEEP and Acrolein, are estimated to be less than their respective Small Quantity Emission Rate (SQER). NO₂ and Acrolein modeling results showed compliance with their respective Acceptable Source Impact Level (ASIL). DEEP was modeled above its ASIL, thus triggering a Second Tier Review, per WAC 173-460-090.

Gary Palcisko performed the Second Tier Review and documented the findings in *Second Tier Review Recommendation Document for VMware Data Center*, dated 5-14-13. In *Ecology's Second Tier Petition for VMware Letter*, dated 5-14-13, Ecology stated that, “[b]ased on the review of VMware's second tier petition, Ecology recommends approval of the proposed project because project related health risks are permissible under WAC 173-460-090 and the project has satisfied all requirements of a second tier analysis. Ecology

recommends that you incorporate our findings as part of your ambient air impacts analysis and you may begin the public comment period when you are ready to do so.”

As required by WAC 173-400-113(3) and WAC 173-460-040(3)(b), allowable emissions from the proposed new source will not cause or contribute to a violation of any ambient air quality standard and are sufficiently low to protect human health and safety from potential carcinogenic and/or other toxic effects.