

**DOCKETED**

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<b>Project Title:</b>	CA3 Backup Generating Facility-Vantage
<b>TN #:</b>	239678
<b>Document Title:</b>	Updated Ammonia Slip Emissions Calculations
<b>Description:</b>	N/A
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**Table 1**  
**Emergency Generator Ammonia Emissions**  
**Vantage CA3 Project**  
**Santa Clara, CA**

Parameter	Value	Unit
Outlet Concentration Limit <sup>1</sup>	10	ppmv
Outlet Gas Oxygen Content <sup>1</sup>	15.0	% O <sub>2</sub>
Molecular Weight of NH <sub>3</sub>	17	lb/lb-mol
NH <sub>3</sub> Emission Factor <sup>1</sup>	0.0144	lb/MMBtu
Diesel Heat Content <sup>2</sup>	19,300	Btu/lb
Diesel Fuel Density <sup>2</sup>	7.1	lb/gal
Generator Fuel Flow <sup>3</sup>	191.7	gal/hr
Annual Operating Hours <sup>4</sup>	35	hr/year
Number of Generators at Full Buildout	44	--
<b>Emissions per Generator</b>	<b>0.38</b>	<b>lb/hr</b>
	<b>13.2</b>	<b>lb/year</b>
<b>Emissions for Generators at Full Buildout</b>	<b>582</b>	<b>lb/year</b>

**Notes:**

1. NH<sub>3</sub> Emission factor is calculated assuming an F factor of 9,190 dscf/MMBtu, using an expected permit limit of 10 ppmv ammonia exhaust concentration at 15% O<sub>2</sub>.
2. Heat content and fuel density of diesel fuel are assumed from U.S. EPA AP-42 Emission Factor Guidance for Large Stationary Diesel And All Stationary Dual-fuel Engines, Table 3.4-1, footnote (a).
3. Generator fuel flow is assumed based on engine application data for Caterpillar generator model 3516E at 100% load.
4. Annual generator emissions assume 35 hours per year of generator maintenance and testing.

**Abbreviations:**

Btu - British thermal units	mol - mole
dscf - dry standard cubic feet	NH <sub>3</sub> - ammonia
gal - gallon	ppmv - parts per million volume
hr - hour	U.S. EPA - United States
lb - pound	Environmental Protection Agency
MMBtu - million British thermal units	

**References:**

U.S. EPA. 1996. Air Emissions Factors and Quantification, Chapter 3.4: Large Stationary Diesel And All Stationary Dual-fuel Engines. Available online at: <https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s04.pdf>