

Statement of Basis  
Caterpillar, Inc.  
(Testing of Marine Engines)  
503-0089  
Major Source of Nitrogen Oxides

Introduction

On February 19, 2019, Caterpillar, Inc. (Caterpillar) submitted a Title V Major Source Operation Permit application for the testing of marine engines (SIC # 3519). Caterpillar is located in Bayou La Batre, Alabama. This is a renewal issuance of the Title V Permit.

Caterpillar is a manufacturer of marine engines and other parts. Facility processes consist of engine test cell operations and diesel storage facilities.

Changes to this Title V Permit revision include incorporating previously permitted natural gas firing capability to the present diesel fired engine capability on the four engine test stands.

Operations Description

Caterpillar performs regular and experimental tests in the 4 test cells on site. Caterpillar also operates an unpermitted ship from the facility that also tests engines. A 20,000 gallon Diesel Tank is onsite to fuel these operations. A 3,000 gallon Diesel Tank is a back-up. These storage tanks will be listed on the Trivial and Insignificant List. No controls are on the engine test stands.

This facility's operations consist of receiving assembled prototype marine diesel engines, testing each unit on one of four marine engine stands with a trailer-mounted dynamometer, and then shipping the engines back to Caterpillar production facilities. The facility is testing engines of various sizes (up to 3,000 HP). The particular engines tested at this facility are designed to burn dual fuel No. 2 diesel fuel (maximum of 15 ppm sulfur content) and natural gas. Caterpillar calculated that the maximum amount of diesel fuel that will be burned in these test stands is 1,750,000 gallons per year which in turn will limit the facility from being considered a major source for PSD. Caterpillar has also calculated the maximum amount of natural gas that will be fired in these test stands is 13,500,000 cubic feet per year which in turn will limit the facility from being considered a major source for PSD.

Emissions

Caterpillar's marine diesel engine testing facility will have the following potential emissions for four total marine testing engines. The potential emissions for PM, SO<sub>2</sub>, NO<sub>x</sub>, VOCs, HAPs, and other criteria pollutants are calculated based on the diesel fuel usage at 8760 hours per year. Sulfur content of 0.05 percent was used in the sulfur dioxide emissions calculation.

Pollutant	Potential Emissions TPY*	Emission Limits TPY w/ 1,750,000 Gallon Limitation	Emission Limits TPY w/ 13,500,000 Ft <sup>3</sup> & 1,750,000 Gallon Limitation
<b>Particulate</b>	<b>18</b>	<b>10</b>	<b>12.3</b>
<b>Sulfur dioxide</b>	<b>17</b>	<b>5</b>	<b>6.2</b>
<b>Nitrogen oxides</b>	<b>642</b>	<b>228</b>	<b>243.6</b>
<b>Carbon monoxide</b>	<b>294</b>	<b>86</b>	<b>129</b>
<b>Volatile organic compounds</b>	<b>31</b>	<b>9</b>	<b>11.2</b>
<b>Total HAPs</b>	<b>2</b>	<b>0.4</b>	<b>0.45</b>
<b>CO<sub>2</sub>e</b>	<b>49724</b>	<b>17613</b>	<b>18560</b>

\*AP-42 emission factors and maximum firing rate for largest engines tested for all 4 engines at 8760 hours.

#### PSD/Title V

Caterpillar is currently limited to a maximum annual consumption of 1,750,000 gallons of diesel fuel and 13,500,000 cubic feet per year of natural gas usage for their four marine engine testing operations. With the limit of 1,750,000 gallons per year on the amount of diesel fuel and 13,500,000 cubic feet per year of natural gas usage Caterpillar may burn in one year, the facility is a major source with regard to Title V and a synthetic minor source for PSD. This would limit their total criteria pollutants below PSD thresholds of 250 TPY. Caterpillar is requesting minor source limits for HAPs emissions to stay below the Title V thresholds of 25 TPY for combinations of HAPs, and 10 TPY of any single HAP. This facility is a synthetic minor source for PSD for their criteria pollutants and a synthetic minor source for HAPs (NESHAP) as a result of this limitation. The diesel fuel and natural gas usage limits will keep their NOx emissions below PSD major source thresholds.

#### NESHAPS/ NSPS

The National Emissions Standards for Hazardous Air Pollutants (NESHAPS) for Engine Test Cells/Stands (PPPPP) is not applicable because the facility has limits to keep their HAPs potential emissions below the Title V major source thresholds. New Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines (III) is not applicable since the standard is not applicable to engines being tested at a stationary test cell/stand (see 60.4200(a)(4)(b)).

The following is a list of all of the facility's sources (individual emissions units) which will be part of the facility's Title V Major Source Operating Permit:

<b>Permit Unit No.</b>	<b>Description of Unit</b>
001	Engine Test Cell Operations No. 1, 2, 3, 4

#### Monitoring of Emissions

Caterpillar maintains records of monthly diesel usage and natural gas usage. These will be maintained for five years and be available for inspection upon request.

The engine testing operations are subject to opacity and particulate standards. Because of the history of compliance and timely reporting at this facility, the engine testing monitoring will be weekly for observing the visible emissions from each unit when vented to the atmosphere. Weekly observations of visible emissions are sufficient to indicate compliance with the particulate standards. If emissions that are greater than normal are noted at any time, corrective action to minimize emissions will be taken within 24 hours, followed by an additional observation to confirm that emissions are reduced to normal. Records of weekly observations and any corrective actions will be retained for at least five years.

CAM is not applicable because potential uncontrolled emissions of criteria pollutants do not exceed 100 tons per year on any one unit with control device(s).

The MSOP is issued on the basis of the complete permit application submitted by Caterpillar. The facility's potential emissions are listed in the permit application dated February 19, 2019.

#### **Permitting Fees**

Title V major sources are subject to operating permit fees which charge the facility a yearly amount based on the actual emission rate of pollutants for the previous year.

#### **Affected States Notification**

Notification of the proposal of this major source operating permit will be sent to all affected states bordering Alabama.

#### **Recommendations**

I recommend that the attached permit be issued to Caterpillar.

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Kevin Fulmer  
Chemical Branch  
March, 2019