

**DRAFT  
ENGINEERING EVALUATION  
The City of Belmont  
110 Sem Lane  
PLANT NO. 21069  
APPLICATION NO: 24030**

**BACKGROUND**

The City of Belmont of Belmont, California is applying for an Authority to Construct and/or Permit to Operate a Portable Standby Emergency Diesel Generator.

**S-1 Portable Standby Generator Set: Diesel Engine; Make: John Deere; Model: 4045HF285H; Model Year; 2010; Rated Horsepower: 133 HP;**

The standby generator will be located at 110 Sem Lane, Belmont California 94002.

**EMISSIONS SUMMARY**

**Annual Emissions:**

The CARB certified emission factors for S-1 (133 HP- diesel engine) are listed below.

<b>Pollutant</b>	<b>Emission Factors (g/bhp-hr)</b>
NOx	2.60
CO	1.20
POC	0.14
PM10	0.15
SO2	0.0055

*\*The emission factor for SO2 is from Chapter 3, Table 3.4-1 of the EPA Document AP-42, Compilation of Air Pollutant Emission Factors.*

$$SO_2 \quad 8.09E-3 \text{ (\% S in fuel oil) lb/hp-hr} = 8.09E-3 \text{ (0.0015\% S) (454 g/lb)} = 0.0055 \text{ g/hp-hr}$$

For S-1:

$$\begin{aligned} NOx &= (2.60 \text{ g/hp-hr}) (133\text{hp}) (20 \text{ hr/yr}) (1\text{b}/454\text{g}) = 15.2 \text{ lb/yr} = 0.008 \text{ TPY} \\ CO &= (1.20 \text{ g/hp-hr}) (133\text{hp}) (20 \text{ hr/yr}) (1\text{b}/454\text{g}) = 7.03\text{lb/yr} = 0.004 \text{ TPY} \\ POC &= (0.14 \text{ g/hp-hr}) (133\text{hp}) (20 \text{ hr/yr}) (1\text{b}/454\text{g}) = 0.820 \text{ lb/yr} = 0.000 \text{ TPY} \\ PM10 &= (0.15 \text{ g/hp-hr}) (133\text{hp}) (20 \text{ hr/yr}) (1\text{b}/454\text{g}) = 0.879 \text{ lb/yr} = 0.000 \text{ TPY} \\ SO2 &= (0.0055\text{g/hp-hr}) (133\text{hp}) (20 \text{ hr/yr}) (1\text{b}/454\text{g}) = 0.032 \text{ lb/yr} = 0.000 \text{ TPY} \end{aligned}$$

**Maximum Daily Emissions:**

A full 24-hour day will be assumed since no daily limits are imposed on intermittent and unexpected operations.

For S-1:

NOx	=	(2.60 g/hp-hr)	(133 hp)	(24 hr/day)	(lb/454g)	=	18.2 lb/day
CO	=	(1.20 g/hp-hr)	(133 hp)	(24 hr/day)	(lb/454g)	=	8.44 lb/day
POC	=	(0.14 hp-hr)	(133 hp)	(24 hr/day)	(lb/454g)	=	0.984 lb/day
PM10	=	(0.15 g/hp-hr)	(133 hp)	(24 hr/day)	(lb/454g)	=	1.05 lb/day
SO2	=	(0.0055 g/hp-hr)	(133 hp)	(24 hr/day)	(lb/454g)	=	0.038 lb/day

**Plant Cumulative Increase: (tons/year)**

Pollutant	Existing	New S-1	Total
NOx	0.000	0.008	0.008
CO	0.000	0.004	0.004
POC	0.000	0.000	0.000
PM10	0.000	0.000	0.000
SO2	0.000	0.000	0.000

**Toxic Risk Screening:**

The toxic emission of diesel particulate does exceed the District Risk Screening Trigger, as shown in Table (1) below, and a Risk Screening Analysis is necessary.

**Table 1.** Calculated incremental increase in diesel exhaust particulate matter for S-1

Source:	PM <sub>10</sub> Emission Factor (g/HP-hr)	HP	Annual Usage (Hours/year) <sup>1</sup>	Diesel Exhaust Particulate Emissions (lb/year):	Trigger Level (lb/yr)	Risk Screen Required? (Yes/No)
1	0.15	133	20	0.89	0.34	Yes

Per the attached 2/22/2012 memo from Catherine Fortney, the analysis estimates the incremental health risk resulting from toxic air contaminant (TAC) emissions from operation of a standby generator diesel engine at this facility. Results from the health risk screening analysis indicate that the maximum cancer risk is estimated at 24.18 in a million. In accordance with the District's Regulation 2-5, this risk level is not considered acceptable. If the applicant agrees to one of the following options, the maximum cancer risk will be reduced to less than 10 in a million, consistent with Regulation 2, Rule 5, if you determine that the engine meets current TBACT requirements:

- Limit the operations to 20 hours per year
- Install a diesel oxidation catalyst on the engine and limit the operations to 29 hours per year
- Install diesel-catalyzed particulate filter on the engine

The applicant has elected to limit the operations to 20 hours per year.

The NOx emission limits set by BACT 2 are met, as shown in Table (2).

Table (2)

Pollutant	Engine Emission Factors (g/hp-hr)	Emission Factor Limits as set by BACT 2 (g/hp-hr)	Have the limits been met?
NOx	2.60	3.0	YES

Therefore, S-1 is determined to be in compliance with the BACT 2 limits for NOx.

**Offsets:** Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NOx. Based on the emission calculations above, offsets are not required for this application.

**NSPS:** The engine is subject to 40 CFR 60, Subpart III, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines because it was manufactured after April 1, 2006, as required by Section 60.4200(a)(2)(i).

The engine has a total displacement of 4.5 liters. Each cylinder has a volume of less than 10 liters. The engine is a 2010 engine and is not a fire pump. Section 60.4205(b) requires these engines to comply with the standard in Section 60.4202 for all pollutants for the same model year and maximum engine power. Section 60.4202(a)(ii) requires that engines over 50 hp must meet the EPA standards in 40 CFR 89.112 and 40 CFR 89.113. For engines between 50 and 175 hp built between 2007 and 2011, these standards are:

NOX: 3.0 g/HP-hr  
CO: 2.6  
PM: 0.15

According to CARB Executive Order U-R-022-0391, the engine will comply with all the standards.

Sections 60.4206 and 60.4211(a) require that the owner/operator operate and maintain the engine according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine. .

Section 60.4207(a) requires that by October 1, 2007, the owner/operator must use fuel that complies with 40 CFR 80.510(a). This means that the fuel must have a sulfur content of 500 parts per million (ppm) maximum, a cetane index of 40 or a maximum aromatic content of 35 volume percent. .

Section 60.4207(b) requires that by October 1, 2010, the owner/operator must use fuel that complies with 40 CFR 80.510(b). This means that the fuel must have a sulfur content of 15 parts per million (ppm) maximum, and the same cetane index or aromatic content. .

Section 60.4209(a) requires a non-resettable hour meter. This requirement is already in the standard permit conditions.

The engine will comply with the requirements of Section 60.4211(b)(1) because it has been certified in accordance with 40 CFR Part 89.

The engine will comply with the requirement in Section 60.4211(e) to run for less than 100 hours per year for maintenance checks and readiness testing, and the prohibition of running for any reason other than emergency operation, maintenance, and testing because they are limited by permit condition to 50 hours per year for reliability testing and otherwise may only operate for emergencies.

The owner/operator is not required to perform tests in accordance with Section 60.4212 or 60.4213.

Section 60.4214 states that owner/operators do not have to submit an initial notification to EPA for emergency engines.

Because the engine does not have a diesel particulate filter, it is not subject to Section 60.4214(c).

The owner/operator is required to comply with certain sections of 40 CFR 60, Subpart A, General Provisions. .

**NESHAP:** This engine is not subject to 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, because it is not located at a major facility for hazardous air pollutants.

**PSD does not apply**

### **PERMIT CONDITIONS**

Application 24030: The City of Belmont: Plant 21069:  
Conditions for S-1

#### **PC 25211**

- 1. The owner/operator shall not exceed 20 hours per year per engine for reliability-related testing.**

**[Basis: "Toxic Risk Screen]**

- 2. The owner/operator shall operate at all times the mobile equipment in conformance with the eligibility requirements set forth in BAAQMD Regulation 2-1-220 for portable equipment.**

**[Basis: Portable Eligibility Requirements]**

- 3. If the owner/operator places the portable equipment at any fixed location in the Bay Area Air Basin for more than 12 months, the portable permit will**

automatically revert to a conventional permanent location BAAQMD permit and will lose its portability.

[Basis: Portable Eligibility Residence Time Requirement]

4. Any violation of Condition #1 shall be reported to the Director of the Compliance and Enforcement Division no later than two business days after the incidence. In addition, any loss of portability per condition #2 shall be reported to the Director of the Compliance and Enforcement Division no later than 30 days after the loss of its portability.

[Basis: Compliance Verification]

#### Regulatory Compliance Requirement

5. The owner/operator shall only fire the mobile equipment with diesel fuel containing less than 0.5% by weight sulfur.

[Basis: Regulation 9-1]

6. The owner/operator shall not discharge any air contaminant into the atmosphere for a period or periods aggregating more than 3 minutes in any one hour that is as dark or darker than Ringlemann 1 or equivalent to 20% opacity.

[Basis: Regulation 6]

7. The owner/operator will ensure that the mobile equipment shall not emit emissions in sufficient
  - a. quantities as to cause a public nuisance under Regulation 1-301.

[Basis: Regulation 1-301]

8. The owner/operator shall not operate the mobile equipment for longer than 72 consecutive hours within 1,000 feet of a school. To operate for longer than 72 consecutive hours within 1,000 feet of a school, the Permit Holder must submit an application to the District so that proper notification of your intended operation can be made known to the affected public in advance of any continued usage of the equipment.

[Basis: Regulation 2-1-412]

#### Record keeping Requirements

9. The owner/operator shall keep the following records in a District approved logbook and retain the records for a period of at least two years following the date of entry. The owner/operator shall keep the log with the equipment and make it available to District staff upon request.
  - a. Weekly hours of operation or fuel usage for the mobile equipment.
  - b. Hours of operation or fuel usage shall be totaled on a monthly basis.

[Basis: Portable Eligibility Residence Time Requirement]

## Reporting Requirements

The Permit Holder shall notify the District, in writing, at least 3 days in advance, of the new location in which they intend to operate for longer than 72 consecutive hours. The notification shall include:

- a. Brief description of the general nature of the operation.
- b. The estimated duration of the operation at this site.
- c. The name and phone number of a contact person where the equipment will be operated.

[Basis: Compliance Verification]

10. Within 30 days after the end of every calendar year, the applicant shall provide a year-end summary showing the following information:
  - a. The location(s) at which the owner/operator operated the equipment for more than 72 consecutive hours including the dates operated at each location.
  - b. The total amount of hours of operation or fuel used by the mobile equipment for the previous 12 months.

[Basis: Regulation 2-1-412]

## RECOMMENDATION

Issue an Authority to the City of Belmont for:

**S-1 Portable Standby Generator Set: Diesel Engine; Make: John Deere; Model: 4045HF285H; Model Year; 2010; Rated Horsepower: 133 HP;**

## EXEMPTIONS

None.

By: \_\_\_\_\_ Date: 03/15/2012  
Sheryl Wallace  
Air Quality Permit Technician