

Engineering Evaluation Report
 Alameda County Public Works, P#14965
 399 Elmhurst Street, Hayward
 Application #6406

Background

Alameda County Public Works has applied for an Authority to Construct and Permit to Operate a small Emergency Diesel Generator, S-1. This generator will be used exclusively for standby power during emergencies.

S-1, Emergency Diesel Generator Set, Generac 8F4M1013EC Deutz, 100 kW, 163 hp

Discretionary use (maintenance and testing) of an emergency generator is limited to no more than 100 hours/yr by regulation, however this can be further limited by the results of the toxic risk screening. Actual emergency use will be unlimited and is not included in the risk screening basis.

Emission Calculations

Maximum daily emissions from the generator for operation 24 hours/day, which may occur under emergency conditions and the annual average emissions for discretionary operation at full load for 6 hrs/yr are quantified below:

PM10: $(0.08 \text{ g/hp-hr})(\text{lb}/453.6\text{g})(163 \text{ hp})(6 \text{ hrs/yr}) = 0.17 \text{ lbs/yr}$
 VOC: $(0.3 \text{ g/hp-hr})(\text{lb}/453.6\text{g})(163 \text{ hp})(6 \text{ hrs/yr}) = 0.65 \text{ lbs/yr}$
 NOx: $(6.1 \text{ g/hp-hr})(\text{lb}/453.6\text{g})(163 \text{ hp})(6 \text{ hrs/yr}) = 13.15 \text{ lbs/yr}$
 CO: $(0.6 \text{ g/hp-hr})(\text{lb}/453.6\text{g})(163 \text{ hp})(6 \text{ hrs/yr}) = 1.29 \text{ lbs/yr}$
 SO2: $(7.1 \text{ gal/hr})(6.11 \text{ lbs/gal})(0.0005)(64.07/32.06)(6 \text{ hrs/yr}) = 0.26 \text{ lbs/yr}$

Pollutant	Annual Emissions, lb/yr	Annual Emissions, tpy	Max Daily Emissions, lb/day
PM10	0.17	0.0001	0.7
VOC	0.65	0.0003	2.6
NOx	13.15	0.0066	52.6
CO	1.29	0.0006	5.2
SO2	0.26	0.0001	1.0

Cumulative Increase

The emissions from operation of S-1 for 6 hrs/year count toward the facility's cumulative increase. This is a new facility with no cumulative increase prior to this application.

Compliance Determination

Regulation 9, Rule 8, "NOx and CO from Stationary Internal Combustion Engines"

The generator in this application is fired with liquid fuel and is subject to Regulation 9, Rule 8 ("NOx and CO from Stationary Internal Combustion Engines"), Sections 330 and 530. These requirements will be included in the permit conditions. The source is also subject to the SO2 limitations of 9-1-301 (ground-level concentration) and 9-1-304 (0.5% by weight in fuel). Compliance with both of these requirements is expected since diesel fuel with a 0.05% by weight sulfur is mandated for use in California. Like all sources, the generator is subject to Regulation 6 ("Particulate and Visible Emissions"). The new generator is not expected to produce visible emissions or fallout in violation of this regulation.

Public Notice Requirements

The public notification requirements of Regulation 2-1-412 apply to modifications at facilities within 1000 feet of a K-12 school. The applicant has reported a school within that radius of this facility. The District's database shows Park Elementary, at 411 Larchmont Street, is 0.19 miles from the facility, so the public notice requirement applies.

Toxic Risk Assessment

S-1 is subject to the District Risk Management Policy, as discussed above, and triggers a toxic risk screen due to diesel particulate emissions. Due to the fact that the applicant could not demonstrate compliance with the TBACT limit of 0.15 g/bhp-hr as measured by ISO 8178 D-2 Cycle testing, the maximum allowable risk to the maximally exposed individual cannot exceed 1 in a million under the Districts Totic Risk Management Policy. This operation does not result in risk exceeding 1 in a million at a discretionary operational level of 6 hours per year, as long as the exhaust stack is 4 inches in diameter and at least 24 feet above grade. The applicant has stated that discretionary operation of hours per year is adequate, and will meet the stack specifications. Based upon discretionary operation of 6 hours/year, the maximum cancer risk was estimated to be 0.9 in a million for maximally exposed residential individual and 0.3 in a million for the maximally exposed individual at the local school.

PSD, NSPS, NESHAPS

PSD, NSPS and NESHAPS do not apply to this source.

CEQA

This application is considered to be ministerial and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 2.3.

BACT, Emission Offsets

The generator triggers BACT with potential emissions of NOx greater than 10 lbs per day. BACT for IC engines less than 175 hp is given in Section 96.1.1 (dated 3-8-01) of the Districts BACT/TBACT Guidelines. S-1 does not meet the BACT1 standard NOx; however, considering that this engine will be operated sporadically for emergency power, add on control to meet BACT1 will not be cost effective. The generator does meet the BACT2 NOx limit. This source complies with BACT.

Pollutant	BACT1/TBACT	S-1 Emissions	BACT2
NOx	1.5 g/bhp-hr	6.1 g/hp-hr	6.9 g/bhp-hr

Since the cumulative increase for this facility is less than 15 tpy of POC and NOx and the facility is not major, emission offset requirements are not triggered.

Permit Conditions # _____

Alameda County Public Works, Plant #14965
Application #6406
Permit Conditions for
S-1 Emergency Diesel Generator Set, Generac 8F4M1013EC Deutz, 100 kW, 163 hp

1. The Standby Emergency Diesel Generator, S-1, shall be fired exclusively on diesel fuel having a sulfur content no greater than 0.05% by weight. The sulfur content of the fuel oil shall be certified by the fuel oil vendor.
(Basis: Cumulative Increase)

2. Hours of Operation: The Standby Emergency Diesel Generator, S-1, shall only be operated to mitigate emergency conditions or for reliability-related activities. Operation for reliability-related activities shall not exceed 6 hours in any calendar year. Operation while mitigating emergency conditions is unlimited.
(Basis: Toxic Risk Screening)
3. "Emergency Conditions" is defined as any of the following:
 - a. Loss of regular natural gas supply.
 - b. Failure of regular electric power supply.
 - c. Flood mitigation.
 - d. Sewage overflow mitigation.
 - e. Fire.
 - f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor.(Basis: Regulation 9-8-231)
4. "Reliability-related activities" is defined as any of the following:
 - a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
 - b. Operation of an emergency standby engine during maintenance of a primary motor.(Basis: Regulation 9-8-232)
5. The Standby Emergency Diesel Generator, S-1, shall be equipped with either:
 - a. a non-resettable totalizing meter that measures and records the hours of operation for the generator.
 - b. a non-resettable fuel usage meter (24.5 gallons of fuel are equivalent to 1 hour of reliability-related operation).(Basis: Regulation 9-8-530)
6. Records: The following monthly records shall be maintained in a District-approved log for at least 2 years and shall be made available for District inspection upon request:
 - a. Total hours of operation or fuel usage; and
 - b. Hours of operation under emergency conditions and a description of the nature of each emergency condition.(Basis: Regulation 9-8-530, Regulation 1-441)
7. The Standby Diesel Generator, S-1, shall be vented through a stack at least 4 inches in diameter and 24 feet above grade.
(Basis: Toxic Risk Screening)

Recommendations

I recommend issuing an Authority to Construct for the following source:

S-1, Emergency Diesel Generator Set, Generac 8F4M1013EC Deutz, 100 kW, 163 hp

Tamiko Endow
Air Quality Engineer

Date