

**ENGINEERING EVALUATION
CITY OF BRENTWOOD; PLANT 15017
APPLICATION 6546**

BACKGROUND

The City of Brentwood has applied for a permit for a new emergency standby generator powered by a diesel engine (S-1). S-1 will be located at a water system booster pump station and will provide backup power for this operation.

The proposed engine will be located within 1,000 feet of the Heritage Baptist Academy, a private K-12 school, and therefore is subject to the public notification requirements of Regulation 2-1-412. There are no other schools within 1/4 mile of the proposed engine, and therefore notification is required only to the parents of students at the Heritage Baptist Academy and to all other addresses within 1,000 feet of the proposed engine.

EMISSIONS

- Basis:
- 685 bhp output rating for full-load, standby operation
 - 100 hr/yr operation for testing and maintenance
 - NO_x, VOC, CO and PM₁₀ emission factors from CARB's certification records (attached):

NO_x: 6.2 g/hp-hr
VOC: 0.03 g/hp-hr (assume all POC compounds)
CO: 0.4 g/hp-hr
PM₁₀: 0.04 g/hp-hr

- SO₂ emission factor is from EPA AP-42, Table 3.4-1 ("Large Stationary Diesel and Dual-Fuel Engines"), which is based on full conversion of fuel sulfur to SO₂ and which will therefore be considered applicable to any diesel engine (sulfur content will be assumed to be the California limit of 0.05 wt% sulfur):

SO₂: 8.09E-3(0.05) lb/hp-hr (454 g/lb)
= 0.18 g/hp-hr

NO_x: (100 hr/yr) (685 hp) (6.2 g/hp-hr) (lb/454 g) / (365 day/yr)
= **2.56 lb/day**

POC: (100 hr/yr) (685 hp) (0.03 g/hp-hr) (lb/454 g) / (365 day/yr)
= **0.01 lb/day**

CO: (100 hr/yr) (685 hp) (0.4 g/hp-hr) (lb/454 g) / (365 day/yr)
= **0.17 lb/day**

PM₁₀: (100 hr/yr) (685 hp) (0.04 g/hp-hr) (lb/454 g) / (365 day/yr)
= **0.02 lb/day**

SO₂: (100 hr/yr) (685 hp) (0.18 g/hp-hr) (lb/454 g) / (365 day/yr)
= **0.07 lb/day**

Daily Emissions:

Daily emissions are calculated to establish whether a source triggers the requirement for BACT (10 lb/highest day total source emissions for any class of pollutants). 24 hr/day operation will be assumed.

NO_x: (24 hr/day) (685 hp) (6.2 g/hp-hr) (lb/454 g) = **225 lb/day**

POC: (24 hr/day) (685 hp) (0.03 g/hp-hr) (lb/454 g) = **1.1 lb/day**

CO: (24 hr/day) (685 hp) (0.4 g/hp-hr) (lb/454 g) = **14 lb/day**

PM₁₀: (24 hr/day) (685 hp) (0.04 g/hp-hr) (lb/454 g) = **1.4 lb/day**

SO₂: (24 hr/day) (685 hp) (0.18 g/hp-hr) (lb/454 g) = **6.5 lb/day**

BACT is triggered for NO_x and CO emissions.

PLANT CUMULATIVE INCREASE

	<u>current</u> <u>(ton/yr)</u>	<u>proposed</u>		<u>new total</u> <u>(ton/yr)</u>
		<u>(lb/day)</u>	<u>(ton/yr)</u>	
POC:	0	0.01	negligible	negligible
NO _x :	0	2.56	0.47	0.47
SO ₂ :	0	0.07	0.01	0.01
CO:	0	0.17	0.03	0.03
NPOC:	0	0	0	0
PM ₁₀ :	0	0.02	negligible	negligible

TOXIC RISK SCREENING ANALYSIS

The only toxic emission which could pose a significant risk is the diesel particulate matter. Because the proposed emissions (6.0 lb/yr) exceed the assigned risk screening trigger level (0.64 lb/yr), a risk screening has been performed. This screening estimated that the toxic risk from this source is less than 10 in a million (see memo from Toxics Group dated 3/4/03). According to the memo, and according to the 1/11/02 revision of the District risk management policy for diesel engines, this risk is acceptable if the engine complies with TBACT requirements. The risk management policy specifies that TBACT consists of a natural gas-fired engine, or, if a diesel engine is necessary, the engine must have a particulate emission rate no greater than 0.15 g/hp-hr (measured in accordance with ISO 8178). Because this engine is an emergency standby engine, which may be required in the event of a natural gas curtailment, the necessity of a diesel engine has been established. The particulate emission rate for this engine is less than 0.15 g/hp-hr (measured in accordance with ISO 8178). Therefore, the engine is considered to satisfy TBACT standards and therefore the estimate risk is acceptable.

STATEMENT OF COMPLIANCE

S-1 will be operated as an emergency standby engine and therefore is not subject to the emission rate limits in Regulation 9, Rule 8 ("NOx and CO from Stationary Internal Combustion Engines"). S-1 is subject to the monitoring and recordkeeping requirements of Regulation 9-8-530 and the SO2 limitations of 9-1-301 (ground-level concentration) and 9-1-304 (0.5% by weight in fuel). Regulation 9-8-530 requirements are incorporated into the proposed permit conditions. Compliance with Regulation 9-1 is very likely since diesel fuel with a 0.05% by weight sulfur is mandated for use in California. Like all sources, S-1 is subject to Regulation 6 ("Particulate and Visible Emissions"). S-1 is not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to be in compliance with Regulation 6 pending a regular inspection.

This application is considered to be ministerial under the District's proposed CEQA guidelines (Regulation 2-1-311) 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.

PSD, NSPS and NESHAPS are not triggered.

Regulation 2-1-412

Notification

The proposed engine will be located within 1,000 feet of the Heritage Baptist Academy, a private K-12 school, and therefore is subject to the public notification requirements of Regulation 2-1-412. There are no other schools within 1/4 mile of the proposed engine, and therefore notification is required only to the parents of students at the Heritage Baptist Academy and to all other addresses within 1,000 feet of the proposed engine.

The attached public notice was delivered The notice was dated xxx and the public comment period ended on xxx.

Comments / Responses

xxx

Copies of all written comments and responses are attached.

BACT

BACT is triggered for NOx and CO by maximum daily emissions exceeding 10 lb/day, as calculated on page 1 (Daily Emissions). S-1 satisfies the current BACT 2 standards for NOx (6.9 g/hp-hr) and CO (2.75 g/hp-hr). A copy of these standards is attached. The more restrictive BACT 1 standard is not applicable to this

engine because it will be limited to operation as a standby engine. TBACT is addressed on page 2 (Toxic Risk Screening Analysis).

OFFSETS

Offsets are not required because facility-wide permitted POC and NOx emissions are each expected to be less than 15 ton/yr. S-1 is the only permitted source at this facility. Combined POC and NOx emissions from S-1 (excluding emergency operation) are estimated to be less than 1 ton/yr.

PERMIT CONDITIONS

APPLICATION 6546; CITY OF BRENTWOOD; PLANT 15017
CONDITIONS FOR S-1

1. The owner/operator of emergency generator S-1 shall use only diesel fuel having a sulfur content less than 0.05% by weight. The sulfur content of the fuel oil shall be certified by the fuel oil vendor.
[Basis: Cumulative Increase]
2. The owner/operator of S-1 shall only operate this engine to mitigate emergency conditions or for reliability-related activities. Operation for reliability-related activities shall not exceed 100 hours in any calendar year. Operation while mitigating emergency conditions is unlimited.
[Basis: Regulation 9-8-330, Cumulative Increase]
3. "Emergency Conditions" is defined as any of the following:
[Basis: Regulation 9-8-231]
 - 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
4. "Reliability-related activities" is defined as any of the following:
[Basis: Regulation 9-8-232]
 - 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
5. The owner/operator of S-1 shall provide this engine with either:
[Basis: Regulation 9-8-530]

- a. a non-resettable totalizing meter that measures and records the hours of operation for the engine
 - b. a non-resettable fuel usage meter
6. The owner/operator of S-1 shall maintain the following monthly records. These records shall be kept in a District-approved log for at least 2 years and shall be made available for District inspection upon request:
- [Basis: Regulations 9-8-530, 1-441]
- a. Total hours of operation
 - b. Hours of operation under emergency conditions and a description of the nature of each emergency condition
 - c. Fuel usage

RECOMMENDATION

Waive Authority to Construct and issue Permit to Operate to the City of Brentwood for:

S-1 Standby Generator Set: Caterpillar 450 kW, Caterpillar 3456 engine, turbocharged, 4-cycle, 966 cubic inch displacement, 685 hp

By:

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