

ENGINEERING EVALUATION
City of Gilroy
PLANT NO. 15827
APPLICATION NO. 8776

BACKGROUND

The City of Gilroy is applying for an Authority to Construct and/or Permit to Operate the following equipment:

S-1 Emergency Standby Generator: Diesel Engine; Make: Kohler; Model: 500REOZV-Generator; Rated Horsepower: 757 HP

The standby generator will be used at 613 Old Gilroy Street, Gilroy CA.

EMISSIONS SUMMARY

Annual Emissions:

The 757 HP diesel engine was tested using ISO 8178 D-2 cycle weighting and the emission factors are listed below:

NO _x	5.52 g/hp-hr
CO	0.38 g/hp-hr
POC	0.185 g/hp-hr
PM ₁₀	0.1 g/hp-hr

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.

$$\text{SO}_2 \quad 8.09\text{E-}3 \text{ (\% S in fuel oil) lb/hp-hr} = 8.09\text{E-}3 \text{ (0.05\% S) (454 g/lb)} = 0.184 \text{ g/hp-hr}$$

$$\begin{aligned} \text{NO}_x &= (5.52 \text{ g/hp-hr})(757 \text{ hp})(100 \text{ hrs/yr})(\text{lb}/454\text{g}) = 920.41 \text{ lb/yr} = 0.46 \text{ TPY} \\ \text{CO} &= (0.38 \text{ g/hp-hr})(757 \text{ hp})(100 \text{ hrs/yr})(\text{lb}/454\text{g}) = 63.36 \text{ lb/yr} = 0.032 \text{ TPY} \\ \text{POC} &= (0.185 \text{ g/hp-hr})(757 \text{ hp})(100 \text{ hrs/yr})(\text{lb}/454\text{g}) = 30.85 \text{ lb/yr} = 0.015 \text{ TPY} \\ \text{PM}_{10} &= (0.1 \text{ g/hp-hr})(757 \text{ hp})(100 \text{ hrs/yr})(\text{lb}/454\text{g}) = 16.67 \text{ lb/yr} = 0.0083 \text{ TPY} \\ \text{SO}_2 &= (0.184 \text{ g/hp-hr})(757 \text{ hp})(100 \text{ hrs/yr})(\text{lb}/454\text{g}) = 30.68 \text{ lb/yr} = 0.015 \text{ TPY} \end{aligned}$$

Maximum Daily Emissions:

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

$$\begin{aligned} \text{NO}_x &= (5.52 \text{ g/hp-hr})(757 \text{ hp})(24 \text{ hrs/day})(\text{lb}/454\text{g}) = 220.90 \text{ lb/day} \\ \text{CO} &= (0.38 \text{ g/hp-hr})(757 \text{ hp})(24 \text{ hrs/day})(\text{lb}/454\text{g}) = 15.21 \text{ lb/day} \\ \text{POC} &= (0.185 \text{ g/hp-hr})(757 \text{ hp})(24 \text{ hrs/day})(\text{lb}/454\text{g}) = 7.40 \text{ lb/day} \\ \text{PM}_{10} &= (0.1 \text{ g/hp-hr})(757 \text{ hp})(24 \text{ hrs/day})(\text{lb}/454\text{g}) = 4.00 \text{ lb/day} \end{aligned}$$

$$\text{SO}_2 = (0.184 \text{ g/hp-hr})(757 \text{ hp})(24 \text{ hrs/day})(\text{lb}/454\text{g}) = 7.36 \text{ lb/day}$$

Plant Cumulative Increase: (tons/year)

Pollutant	Existing	New	Total
NOx	0	0.46	0.46
POC	0	0.015	0.015
CO	0	0.031	0.031
SO2	0	0.015	0.015
PM10	0	0.0083	0.0083
NPOC	0	0	0

Toxic Risk Screening:

The toxic emission of diesel particulate exceeds the District Risk Screening Trigger, as shown in Table (1) below, and a Risk Screening Analysis has been performed.

Table (1)

Source:	PM ₁₀ Emission Factor (g/HP-hr)	HP	Annual Usage (Hours/year) ¹	Diesel Exhaust Particulate Emissions (lb/year):	Trigger Level (lb/yr)	Risk Screen Required? (Yes/No)
1	0.10	757	100	16.67	0.64	Yes

Per the attached 02/24/04 memo from Jane Lundquist of the District Toxics Evaluation Section results from the health risk screening analysis indicate that the maximum cancer risk is estimated at 2 in a million for 100 hours of operation per year, excluding periods when operation is required due to emergency conditions. In accordance with the District's Risk Management Policy, this risk level is considered acceptable because the engine meets the TBACT requirement.

The ISCST3 computer model with Gilroy meteorological data was used to estimate annual average ambient air concentrations. Stack and building parameters for the analysis were based on information provided by the applicant. Estimates of residential risk assume continuous 70-year exposure to annual average TAC concentrations. Students attending Eliot Elementary School were assumed to be exposed for a nine year period for 36 weeks a year. Students were assumed to have a higher breathing rate than residents (581 L/kg-day instead of 286 L/kg-day).

PUBLIC COMMENT

The public notice will be posted on the internet and mailed to all Parents or Guardians with children enrolled at Eliot Elementary School. It will also be mailed to all residential neighbors located within 1000 feet of the proposed new source of pollution.

¹ Annual Usage based on 100 hours per year of operation for reliability-related activities as defined in Regulation 9-8-330 ("Emergency Standby Engines, Hours of Operations").

STATEMENT OF COMPLIANCE

The owner/operator of S-1 shall comply with Reg. 6 (Particulate Matter and Visible Emissions Standards) and Reg. 9-1-301 (Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations). This engine is not expected to produce visible emissions or fallout in violation of Reg. 6 and will be assumed to be in compliance with Reg. 6 pending a regular inspection. Low sulfur diesel (0.05wt%) will be used to meet the sulfur limitation of 0.5wt% in Reg. 9-1-304. Because S-1 is an emergency standby generator, Reg. 9-8-110 (Inorganic Gaseous Pollutants: Nitrogen Oxides from Stationary Gas Turbines) exempts the requirements for emission limits of Sections 9-8-301, 302, and 502. Allowable operating hours and the corresponding record keeping in Reg. 9-8-330 and 530 will be included in the Permit Conditions below.

The project is considered to be ministerial under the District's CEQA 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 emissions factors and therefore is not discretionary as defined by CEQA. (Permit Handbook Chapter 2.3)

Best Available Control Technology:

In accordance with Regulation 2, Rule 2, Section 301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO_x, CO, SO₂ or PM₁₀.

Based on the emission calculations above, the owner/operator of S-1 is subject to BACT for the following pollutants: NO_x and CO. BACT 1 levels do not apply for 'engines used exclusively for emergency use during involuntary loss of power' as per Reference b, Document 96.1.2 of the BAAQMD BACT Guidelines for IC Engines. Hence, the owner/operator has to meet BACT 2 limits presented below.

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
NO _x	1. 1.5 g/bhp-hr [107 ppmvd @ 15% O ₂] ^{a,b} 2. 6.9 g/bhp-hr [490 ppmvd @ 15% O ₂] ^{a,b,c} 3. 6.9 g/bhp-hr [490 ppmvd @ 15 % O ₂]	1. <i>Selective Catalytic Reduction (SCR) + Timing Retard + Turbocharger w/ Intercooler</i> ^{a,b} 2. <i>Timing Retard ≤ 4° + Turbocharger w/ Intercooler</i> ^{a,b,c} 3. <i>Timing Retard ≤ 4° + Turbocharger w/ Intercooler</i>
CO	1. n/s 2. 2.75 g/bhp-hr [319 ppmvd @ 15% O ₂] ^{b,c}	1. <i>Catalytic Oxidation</i> ^b 2. <i>CARB or EPA (or equivalent) low-CO emitting certified engine</i> ^{b,c}

NO_x, and CO emission limits set by BACT 2 are met, as shown in Table (2) below.

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	5.52	6.9	YES
CO	0.38	2.75	YES

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

Since ISO 8178 D-2 cycle weighted factors were used to establish the NOx and CO emission factors, the BACT 2 emission limits have not been incorporated into the permit conditions and are assumed to be complied with through the design standards demonstrated by the ISO 8178 D-2 testing.

Offsets: Offsets must be provided for any new or modified source at a facility that emits more than 15 tons/yr of POC or NOx. Based on the emission calculations above, offsets are not required for this application.

PSD, NSPS, and NESHAPS do not apply.

PERMIT CONDITIONS

Conditions for S-1 Emergency Diesel Generator

Application #8776, Plant #15827, City of Gilroy (PC 21283):

1. The owner/operator shall fire S-1 exclusively with diesel fuel with sulfur content no greater than 0.05wt%.
(basis: Cumulative Increase)
2. The owner/operator shall operate S-1 only under the following circumstances:
 - a) For emergency use for an unlimited number of hours.
 - b) For reliability-related activities so long as total hours of operation for this purpose do not exceed 100 hours in a calendar year.
(basis: Reg. 9-8-330)

Emergency use is defined by the following circumstances:

- a) In the event of loss of regular natural gas supply;
- b) In the event of 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: Reg. 9-8-231)

Reliability-related activities are defined as either:

- 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: Reg. 9-8-232)
3. The owner/operator shall equip S-1 with either:
- a) a non-resettable totalizing meter that measures hours of operation for the engine; or
 - b) a non-resettable fuel usage meter (37.3 gallons of fuel shall be assumed to be equivalent to one hour of reliability related operation).
(basis: Reg. 9-8-530)
4. To determine compliance with the above conditions, the owner/operator shall maintain the following records and provide all of the data necessary to evaluate compliance with the above conditions. A monthly log of usage shall indicate the following:
- a) Hours of operation (total)
 - b) Hours of operation (emergency)
 - c) For each emergency, the nature of the emergency condition
- The owner/operator shall record all records in a District-approved log. The owner/operator shall retain the records on-site for two years, from the date of entry, and make them available for inspection by District staff upon request. These record-keeping requirements shall not replace the record-keeping requirements contained in any applicable District Regulations.
(basis: Toxic Risk Screen, Regulation 1-441, Reg. 9-8-530)

RECOMMENDATION

Waive Authority to Construct and issue a Permit to Operate to City of Gilroy:

S-1 Emergency Standby Generator: Diesel Engine; Make: Kohler; Model: 500REOZV; Rated Horsepower: 757 HP

EXEMPTIONS

None.

By: _____

Jenny Pyon
Air Quality Engineering Intern

Date: _____