

**DRAFT
ENGINEERING EVALUATION
The Wiseman Company
Plant: 18950; Application: 17439**

BACKGROUND

The Wiseman Company has applied for an Authority to Construct and/or Permit to Operate the following equipment:

- S-1 Emergency Standby Generator: Natural Gas Engine, Make: General Motors, Model: 5.0L; Rated Horsepower: 89 HP**
- A-1 Non-selective catalytic reduction with air/fuel ratio controller, Make: Clean Air Systems, Product Part No.: CQD0750BCCN30**

The generator will be used at 1250 Main St., Napa, CA 94559. It will provide emergency power (in the event of a blackout) for all essential electrically powered equipment at the facility. This emergency engine must be periodically tested to ensure that they will generate power when needed.

EMISSIONS

Annual Average Emissions:

- Basis:
- 89 bhp output rating, standby operation
 - 100 hr/yr operation for testing and maintenance
 - Firing rate of 0.781 MMBTU/hr
 - NOx, POC, CO and PM10 emission factors provided by the vendor:

Table 1

Pollutant	Unabated Emission Factor (g/BHP-hr)	Abatement Efficiency (%)	Abated Emission Factor (g/BHP-hr)
NOx	7.1	90	0.71
CO	44.5	95	2.23
POC	2.0	90	0.20
PM10	N/A	N/A	N/A

SO2 emission factor is from EPA AP-42, Table 3.2-2 (Uncontrolled Natural Gas Emission Factors for 4-Stroke Rich-Burn Engines):

SO2: 5.88E-4 lb/MMBtu

NOx: $(100 \text{ hr/yr})(89 \text{ hp})(0.71 \text{ g/hp-hr})(\text{lb}/454 \text{ g}) = 13.92 \text{ lb/yr} = 0.0070 \text{ ton/yr}$

CO: $(100 \text{ hr/yr})(89 \text{ hp})(2.23 \text{ g/hp-hr})(\text{lb}/454 \text{ g}) = 43.62 \text{ lb/yr} = 0.0218 \text{ ton/yr}$

POC: $(100 \text{ hr/yr})(89 \text{ hp})(0.20 \text{ g/hp-hr})(\text{lb}/454 \text{ g}) = 3.92 \text{ lb/yr} = 0.0020 \text{ ton/yr}$

PM10: $(100 \text{ hr/yr})(89 \text{ hp})(0 \text{ g/hp-hr})(\text{lb}/454 \text{ g}) = 0 \text{ lb/yr} = 0 \text{ ton/yr}$

SO2: $(100 \text{ hr/yr}) (0.781 \text{ MMBtu/hr}) (5.88\text{E-}4 \text{ lb/MMBtu}) = 0.0459 \text{ lb/yr} = 0.00002 \text{ ton/yr}$

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.

NOx: (24 hr/day)(89 hp)(0.71 g/hp-hr)(lb/454 g) = **3.34 lb/day**

CO: (24 hr/day)(89 hp)(2.23 g/hp-hr)(lb/454 g) = **10.47 lb/day**

POC: (24 hr/day)(89 hp)(0.20 g/hp-hr)(lb/454 g) = **0.941 lb/day**

PM10: (24 hr/day)(89 hp)(0 g/hp-hr)(lb/454 g) = **0 lb/day**

SO2: (24 hr/day)(0.781 MMBtu/hr)(5.88E-4 lb/MMBtu) = **0.011 lb/day**

PLANT CUMULATIVE INCREASE

The Wiseman Company is a new facility. Therefore, the District’s database does not contain information on existing emissions at the plant. Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result at Plant 18950 from the operation of S-1.

Table 2

Pollutant	Current plant emissions (TPY)	Increase in plant emissions associated with this application (TPY)	Cumulative emissions (Current + Increase) (TPY)
NOx	0	0.0070	0.0070
POC	0	0.0020	0.0020
CO	0	0.0218	0.0218
PM10	0	0.0000	0.0000
SO2	0	0.00002	0.00002

TOXIC RISK SCREENING ANALYSIS

Emissions factors for a 4-stroke rich-burn natural gas engine will be used to estimate the emissions from the engine. Emissions factors are from EPA AP-42 Table 3.2-3. As seen in Appendix A of this report, no toxic air contaminants exceed the District Risk Screening Triggers and a Risk Screening Analysis is not required.

PUBLIC NOTIFICATION

The project is within 1000 feet of a public school and therefore subject to the public notification requirements of Reg. 2-1-412. The public notice will be posted on the Internet and mailed to all Parents or Guardians with children enrolled at St. John the Baptist School, Blue Oak School and New Technology High School. It will also be mailed to all residential neighbors located within 1000 feet of the proposed new source of pollution.

BACT

BACT is triggered for CO since the maximum daily emission of the above pollutant exceeds 10 lb/day. Please refer to the discussion on “Daily Emissions” in page 2 of this evaluation. BACT for this source is presented in the current BAAQMD BACT/TBACT Workbook for this source category as shown below:

Source Category

Source:	<i>IC Engine – Spark Ignition, Natural Gas Fired Emergency Engine</i>	Revision:	<i>1</i>
		Document #:	<i>96.3.4</i>
Class:	<i>>= 50 HP</i>	Date:	<i>5/7/03</i>

Determination

POLLUTANT	BACT		TYPICAL TECHNOLOGY
	1. Technologically Feasible/ Cost Effective	2. Achieved in Practice	
POC	1. <i>n/d</i> 2. <i>1.0 g/bhp-hr^a</i>		1. <i>n/d</i> 2. <i>lean burn technology^a</i>
NO _x	1. <i>n/d</i> 2. <i>1.0 g/bhp-hr^a</i>		1. <i>n/d</i> 2. <i>lean burn technology^a</i>
SO ₂	1. <i>n/a</i> 2. <i>n/s</i>		1. <i>n/a</i> 2. <i>natural gas^a</i>
CO	1. <i>n/d</i> 2. <i>2.75 g/bhp-hr^a</i>		1. <i>n/d</i> 2. <i>lean burn technology^a</i>
PM ₁₀	1. <i>n/d</i> 2. <i>n/s</i>		1. <i>n/d</i> 2. <i>natural gas^a</i>

References

a. 1993 BACT 2 levels for IC Engine-Spark Ignition, Nat. Gas >_ 250 HP (3/19/93) without the need for post-combustion controls (not considered to be cost effective for emergency only applications).

It can be seen from above that S-1 satisfies the current BACT 2 standard for CO (2.75 g/bhp-hr). The more restrictive BACT 1 standard is not applicable to this engine because it will be limited to operation as an emergency standby engine.

OFFSETS

Offsets are not required because permitted POC and NO_x emissions are each expected to be less than 10 ton/yr per Regulation 2-2-301.2.

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 ("NO_x and CO from Stationary Internal Combustion Engines"). S-1 is subject to the monitoring and record keeping 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 natural gas has negligible sulfur content. Like all combustion sources, S-1 is subject to Regulation 6 ("Particulate and Visible Emissions"). This engine 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 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.

The Wiseman Company

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The project is within 1000 feet of the nearest school and therefore the owner/operator is subject to the public notification requirements of Reg. 2-1-412. A public notice was prepared and sent on [redacted], 2008:

All addresses within 1000 feet of the natural gas generator and Parents and guardians of students at St. John the Baptist School, Blue Oak School And New Technology High School.

[redacted]

PSD, NSPS and NESHAPS are not triggered.

PERMIT CONDITIONS

COND# 23868 -----

- 1. Operating for reliability-related activities is limited to 100 hours per year per engine.
[Basis: Regulation 9-8-330.2]
- 2. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained.
[Basis: Regulation 9-8-530]
- 3. The owner/operator shall operate each emergency standby engine only when abated by a Clean Air Systems non-selective catalytic reduction and air/fuel ratio controller. The owner/operator shall ensure that the Clean Air Systems non-selective catalytic reduction and air/fuel ratio controller are operated in accordance with manufacturer instructions and properly maintained.
[Basis: BACT]
- 4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 24 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
 - a. Hours of operation for reliability-related activities (maintenance and testing).
 - b. Hours of operation for emission testing to show compliance with emission limits.
 - c. Hours of operation (emergency).
 - d. For each emergency, the nature of the emergency condition.
 - e. Fuel usage for each engine(s).
 [Basis: Regulation 9-8-530]

RECOMMENDATION

Issue an Authority to Construct to The Wiseman Company for:

The Wiseman Company

Plant: 18950

Application: 17439

- S-1 Emergency Standby Generator: Natural Gas Engine, Make: General Motors, Model: 5.0L; Rated Horsepower: 89 HP**
- A-1 Non-selective catalytic reduction with air/fuel ratio controller, Make: Clean Air Systems, Product Part No.: CQD0750BCCN30**

at 1250 Main St., Napa, CA 94559.

Milyani H. Rizal
Air Quality Engineering Intern
Engineering Division

Appendix A

Toxic Air Contaminants from S-1 Emergency Standby Generator Set: AP-42 Emissions for Natural Gas-fired Reciprocating Engines 3.2 Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines.

Criteria Pollutant	Source Specific EF (lb/MMBTU)	CATEF EF (lb/MMBTU)	Emissions (lb/year)	Trigger Level (lb/year)	Chronic Trigger? (Yes/No)	Emissions (lb/hr)	Trigger Level (lb/hr)	Trigger? (Yes/No)
NOx		2.21E+00	172.6452					
CO		3.72E+00	290.6064					
SO2		5.88E-04	0.0459346					
VOC		2.96E-02	2.312352					
PM10		9.50E-03	0.74214					
Toxic Air Contaminant								
1,1,2,2-Tetrachloroethane*		2.53E-05	1.98E-03	3.20E+00	No			
1,1,2-Trichloroethane*		1.53E-05	1.20E-03	1.10E+01	No			
1,1-Dichloroethane*		1.13E-05	8.83E-04	1.10E+02	No			
1,3-Butadiene*		6.63E-04	5.18E-02	1.10E+00	No			
Acetaldehyde		8.66E-04	6.77E-02	6.40E+01	No			
Acrolein		5.36E-04	4.19E-02	2.30E+00	No	4.19E-04	4.20E-04	No
Benzene		1.87E-03	1.46E-01	2.90E+00	No	1.46E-03	6.40E+00	No
Carbon Tetrachloride*		1.77E-05	1.38E-03	4.30E+00	No	1.38E-05	4.20E+00	No
Chlorobenzene*		1.29E-05	1.01E-03	3.90E+04	No			
Chloroform*		1.37E-05	1.07E-03	3.30E-01	No	1.07E-05	3.40E+01	No
Ethylbenzene*		2.48E-05	1.94E-03	7.70E+04	No			
Ethylene Dibromide*		2.13E-05	1.66E-03	2.60E+00	No			
Formaldehyde*		2.05E-02	1.60E+00	3.00E+01	No	1.60E-02	2.10E-01	No
Methanol*		3.06E-03	2.39E-01	1.50E+05	No	2.39E-03	6.20E+01	No
Methylene Chloride*		4.12E-05	3.22E-03	1.80E+02	No	3.22E-05	3.10E+01	No
Naphthalene*		9.71E-05	7.59E-03	5.30E+00	No			
PAH or derivative								
Benzo(a)anthracene	0.1	2.88E-07						
Benzo(a)pyrene	1	1.13E-07						
Benzo(b)fluoranthene	0.1	2.32E-07						
Benzo(k)fluoranthene	0.1	1.01E-07						
Dibenz(a,h)anthracene	1.05	1.23E-08						
Indeno(1,2,3-cd)pyrene	0.1	1.66E-07						
PAH or derivative TOTAL		2.04E-07	1.60E-05	1.10E-02	No			
Styrene		1.19E-05	9.30E-04	3.50E+04	No	9.30E-06	4.60E+01	No
Toluene		1.05E-03	8.20E-02	1.20E+04	No	8.20E-04	8.20E+01	No
Vinyl Chloride		7.18E-06	5.61E-04	2.40E+00	No	5.61E-06	4.00E+02	No
Xylene		2.03E-04	1.59E-02	2.70E+04	No	1.59E-04	4.90E+01	No

* AP-42 Factors were used instead of CATEF