

DRAFT

ENGINEERING EVALUATION

Verizon Wireless

PLANT NO. 16880

APPLICATION NO. 12029

BACKGROUND

Verizon Wireless of Antioch, California is applying for an Authority to Construct and/or Permit to Operate for the following equipment:

S-1 Stationary Standby Generator Set: Diesel Engine; Make: John Deere; Model: 5030HF270; Rated Horsepower: 96 HP

The standby generator will be located at 5201 Deer Valley Road, Antioch, CA 94531. In order to bypass RSA, applicant has agreed to accept a reduction in permitted non-emergency operation hours to 33 hours per year. Due to its location within 500 feet of Deer Valley High School, this project will require Public Notification, and testing or maintenance may not be conducted between 7:30 AM and 3:30 PM on days when schools are in session.

EMISSIONS SUMMARY

Annual Emissions:

The manufacturer-supplied, ISO 8178-D2 test cycle emission factors for S-1 (96 HP- diesel engine) are listed below.

Pollutant	Emission Factors (g/hp-hr)
	S-1
NO _x	4.92
CO	0
POC	0.34
PM10	0.09
SO ₂ *	0.184*

*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.

$$SO_2 = 8.09E-3 (\% S \text{ in fuel oil}) \text{ lb/hp-hr} = 8.09E-3 (0.05\% S) (454 \text{ g/lb}) = 0.184 \text{ g/hp-hr}$$

$$NO_x = (4.92 \text{ g/hp-hr}) (96 \text{ hp}) (33 \text{ hr/yr}) (1\text{b}/454\text{g}) = 34.3 \text{ lb/yr} = 0.017 \text{ TPY}$$

$$CO = (0.00 \text{ g/hp-hr}) (96 \text{ hp}) (33 \text{ hr/yr}) (1\text{b}/454\text{g}) = 0 \text{ lb/yr} = 0.000 \text{ TPY}$$

$$POC = (0.34 \text{ g/hp-hr}) (96 \text{ hp}) (33 \text{ hr/yr}) (1\text{b}/454\text{g}) = 2.37 \text{ lb/yr} = 0.001 \text{ TPY}$$

$$PM_{10} = (0.09 \text{ g/hp-hr}) (96 \text{ hp}) (33 \text{ hr/yr}) (1\text{b}/454\text{g}) = 0.63 \text{ lb/yr} = 0.000 \text{ TPY}$$

$$SO_2 = (0.184 \text{ g/hp-hr}) (96 \text{ hp}) (33 \text{ hr/yr}) (1\text{b}/454\text{g}) = 1.28 \text{ lb/yr} = 0.001 \text{ TPY}$$

The diesel particulate emissions estimate used in this analysis is based on an emission factor of 0.09 g/bhp-hr. This factor is specific to the Model 5030HF270 and is based on ISO 8178-D2 test cycle weighted factors. For 33 hours per year of operation, the annualized diesel particulate rate is 0.63 lbs/yr. The CARB certification uses the highest emission rates for this engine family. However, we used emission rates that were based on ISO 8178-D2. The tests were submitted to CARB for certification.

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 = (4.92 g/hp-hr) (96 hp) (24 hr/day) (lb/454g) = 25.0 lb/day

CO = (0.00 g/hp-hr) (96 hp) (24 hr/day) (lb/454g) = 0 lb/day

POC = (0.34 g/hp-hr) (96 hp) (24 hr/day) (lb/454g) = 1.73 lb/day

PM10 = (0.09 g/hp-hr) (96 hp) (24 hr/day) (lb/454g) = 0.46 lb/day

SO2 = (0.184 g/hp-hr) (96 hp) (24 hr/day) (lb/454g) = 0.93 lb/day

Plant Cumulative Increase: (tons/year)

Pollutant	Existing	New	Total
NOx	0	0.017	0.017
CO	0	0.000	0.000
POC	0	0.001	0.001
PM10	0	0.000	0.000
SO2	0	0.001	0.001
NPOC	0	0.000	0.000

Toxic Risk Screening:

The toxic emission of diesel particulate does not exceed the District Risk Screening Trigger, as shown in Table (1) below, and a Risk Screening Analysis is not necessary.

Table 1. Calculated incremental increase in diesel exhaust particulate matter for S-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	0.09	96	33	0.63	0.64	No

PUBLIC COMMENT

The project is within 1000 feet of Deer Valley High School and is therefore subject to the public notification requirements of Reg. 2-1-412. Expanding the search radius to 0.25 miles does not reveal any additional schools. The public notice will be posted on the Internet and mailed to all Parents or Guardians with children enrolled at the aforementioned school(s). It

¹ Annual Usage based on 33 hours per year of operation for reliability-related activities as accepted by applicant via letter to Henry Leung for the purpose of bypassing RSA.

will also be mailed to all residential neighbors located within 1000 feet of the proposed new source of pollution.

At-school and near school provisions:

No owner or operator shall operate an in-use stationary emergency standby diesel-fueled compression Ignition engine for non-emergency use, including maintenance and testing, during the following periods: a) whenever there is a school sponsored activity, if the engine is located on school grounds, and b) between 7:30 a.m. and 3:30 p.m. on days when school is in session, if the engine is located within 500 feet of school grounds.

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). Since this engine meets TBACT for PM10 (<0.15 g/hp-hr), it is expected to comply with Reg. 6. 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 engine, Reg. 9-8-110 (Inorganic Gaseous Pollutants: Nitrogen Oxides from Stationary Internal Combustion Engine) 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.

This diesel engine is subject to the Stationary Diesel Airborne Toxic Control Measure (ATCM) and is considered an in-use stationary emergency standby diesel engine since it was installed before January 1, 2005 and is larger than 50 HP. The requirements of the ATCM will be included in the permit conditions.

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 pollutant: NO_x. 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 on the next page.

POLLUTANT	BACT	TYPICAL TECHNOLOGY
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	1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	
NOx	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. Selective Catalytic Reduction (SCR) + Timing Retard + Turbocharger w/ Intercooler ^{a,b} 2. Timing Retard $\leq 4^\circ$ + Turbocharger w/ Intercooler ^{a,b,c} 3. Timing Retard $\leq 4^\circ$ + Turbocharger w/ Intercooler

The NOx emission limit set by BACT 2 is 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	4.92	6.9	YES

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

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 Stationary Standby Generator Set
Application #12029, Plant #16880, Verizon Wireless:

PC 22123

- Hours of Operation: The owner/operator shall operate the emergency standby engine(s) only to mitigate emergency conditions or for reliability-related activities. Operating while mitigating emergency conditions is unlimited. Operating for reliability-related activities is limited to 33 hours per any calendar year.
[Basis: Regulation 9-8-330]

"Emergency Conditions" is defined as any of the following:

- Loss of regular natural gas supply.
- Failure of regular electric power supply.
- Flood mitigation.
- Sewage overflow mitigation.
- Fire.
- Failure of a primary motor, but only for such time as needed to repair or replace the primary motor.

[Basis: Regulation 9-8-231]

"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]

2. The owner/operator shall equip the emergency standby engine(s) with either:
 - a. a non-resettable totalizing meter that measures the hours of operation for the engine; or
 - b. a non-resettable fuel usage meter, the maximum hourly fuel rate shall be used to convert fuel usage to hours of operation.

[Basis: Regulation 9-8-530]

3. The owner/operator shall not operate the emergency standby engine(s) for non-emergency use, including maintenance and testing, during the following periods:
 - a. whenever there is a school sponsored activity, if the engine is located on school grounds, and
 - b. between 7:30 a.m. and 3:30 p.m. on days when school is in session, if the engine is locate within 500 feet of school grounds.

[Basis: ATCM]

4. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 2 years and shall make the log available for District inspection upon request:
 - a. Hours of operation (total).
 - b. Hours of operation (emergency).
 - c. For each emergency, the nature of the emergency condition.
 - d. Fuel usage for engine(s) if a non-resettable fuel usage meter is utilized.

[Basis: Regulations 9-8-530 and 1-441]

RECOMMENDATION

Issue an Authority to Construct to Verizon Wireless for:

S-1 Stationary Standby Generator Set: Diesel Engine; Make: John Deere; Model: 5030HF270; Rated Horsepower: 96 HP

EXEMPTIONS

None.

By: _____

Date: _____

Roy Lo
Air Quality Engineering Intern