

**DRAFT**  
**ENGINEERING EVALUATION**  
**Geary – Market Investment, Company, Ltd**  
**Plant No: 23726**  
**Application No: 28274**

**BACKGROUND**

The Geary – Market Investment Company, Ltd of San Rafael has applied for an Authority to Construct or Permit to Operate a standby generator powered by a Natural Gas engine (S-1). The engine will be located at 1000 4<sup>th</sup> Street, San Rafael, CA 94901.

**S-1 Emergency Standby Generator Set: Natural Gas Engine Make: Generac Power Systems, Inc.; Model: SG070 6.8L: Model Year; 2016; Rated Horsepower: 107 HP; Abated by Three Way Catalyst and Air/Fuel Ratio Control System.**

**EMISSIONS**

The 107 hp Natural Gas engine was tested and the emission factors are listed below in table (1). For this report, it is assumed that the emission value of Total Unburned Hydrocarbons (HC) is equivalent to the emission value of POC.

Abatement Device: The engine is equipped with a Three Way Catalyst and Air/Fuel Ratio Control System abatement device.

Table (1)

Component	Controlled Emission (g/bhp·hr)
NOx	0.04
CO	0.49
POC	0.20
PM <sub>10</sub>	Negligible

*\*The emission factor for SO<sub>2</sub> is from Chapter-3, Table 3.2-2 of the EPA Document AP-42, Emission Factors for 4-Stroke Rich-Burn Engines. SO<sub>2</sub>:5.88E-4 lb/MMBtu*

*Manufacturer guarantees emission factors at BAAQMD BACT Standards*

**Maximum Emissions in Tons per year:**

Table (2)

NOx	=	( 0.04 g/bhp-hr )	( 107hp )	( 50 hr )	( 454 g/lb )	=	0.47 lb/yr	0.000 TPY
CO	=	( 0.49 g/bhp-hr )	( 107hp )	( 50 hr )	( 454 g/lb )	=	5.77 lb/yr	0.002 TPY
POC	=	( 0.20 g/bhp-hr )	( 107hp )	( 50 hr )	( 454 g/lb )	=	2.35 lb/yr	0.001 TPY
PM10	=	( 0.00 g/bhp-hr )	( 107hp )	( 50 hr )	( 454 g/lb )	=	0.000 lb/yr	0.000 TPY
SO2	=	(0.0058 g/bhp-hr)	( 107hp )	( 50 hr )	( 454 g/lb )	=	0.068 lb/yr	0.000 TPY

**Maximum Daily Emissions:**

A full 24-hour day will be assumed since no daily limits are imposed on intermittent and unexpected operations. Check Table (3) for emissions per day.

Table (3)

NOx	=	( 0.04 g/hp-hr )	( 107 hp )	( 24 hr )	( 454 g/lb )	=	0.23 lb/day
CO	=	( 0.49 g/bhp-hr )	( 107 hp )	( 24 hr )	( 454 g/lb )	=	2.77 lb/day
POC	=	( 0.20 g/bhp-hr )	( 107 hp )	( 24 hr )	( 454 g/lb )	=	1.13 lb/day
PM10	=	( 0.00 g/bhp-hr )	( 107 hp )	( 24 hr )	( 454 g/lb )	=	0.000 lb/day
SO2	=	(0.0058 g/hp-hr)	( 107 hp )	( 24 hr )	(454 g/lb )	=	0.032 lb/day

Plant Cumulative Increase: (tons/year): Cumulative increase from the plant is as shown in Table (4).

Table (4)

Plant Cumulative Increase: (tons/year)

Pollutant	Existing	New S-1	Total TPY
NOx	0.000	0.000	0.000
CO	0.000	0.002	0.002
POC	0.000	0.001	0.001
PM10	0.000	0.000	0.000
SO2	0.000	0.000	0.000

**Toxic Risk Screening:**

Emission factors for a 4-stroke rich-burn Natural Gas engine will be used to estimate the emissions from the engine. Emissions factors are from the California Air Toxic Emission Factors. S-1 is not in excess of any of the risk screening triggers for the CATEF table. A Risk Screening Analysis is not required.

	Compound Name	CATEF Emission Factor lb/MMcf (Fuel Input)	Emission Factor lb/Mmbtu	Calculated Emission (lbs/yr)	TAC Trigger Levels in lb/yr
Trace Organic Compounds					
	1,3-Butadiene	1.05E-01	1.00E-04	0.01	1.10
	Acetaldehyde	1.82E+00	1.73E-03	0.09	64.00
	Benzene	1.02E+01	9.71E-03	0.51	6.40
	Formaldehyde	5.77E+00	5.50E-03	0.29	30.00
	Naphthalene	8.66E-02	8.25E-05	0.00	5.30
	PAH	2.54E-07	2.42E-10	0.00	0.01
	Toluene	2.62E+00	2.50E-03	0.13	12000.00
	Xylene	7.38E-02	7.03E-05	0.00	27000.00

	insert MMBTU/yr	5.30E+01			
Note: fuel usage is based on 1009 scf/hr, 1050 btu/scf, 50 hr/yr = 52.9 MMBtu/yr					

**Public Notification:**

Since this plant is located within 1000 feet of Saint Raphael Elementary School, Public Notification is required.

**STATEMENT OF COMPLIANCE**

S-1 is subject to the monitoring and record keeping requirements of Regulation 9-8-530 and the SO<sub>2</sub> 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. Like all sources, S-1 is subject to Regulation 6 ("Particulate and Visible Emissions"). The engine is not expected to produce visible emissions or fallout in violation of this regulation and it will be assumed to comply with Regulation 6 pending a regular inspection. Emergency use of emergency standby engines is not subject to Toxics Risk Screening per 2-5-111.

**California Environmental Quality Act (CEQA):**

This application is considered ministerial under the District's proposed CEQA guidelines (Regulation 2-1-312) and therefore is not subject to CEQA review.

**Offsets:** Offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NO<sub>x</sub>. Based on the emission calculations above, offsets are not required for this application.

**The New Source Performance Standard (NSPS)** in 40 CFR 60, Subpart JJJJ does apply. The engine will comply with the following limits in Table 1 for emergency spark-ignited engines under 130 hp:

NOx: 10.0 g/hp-hr  
CO: 387.0 g/hp-hr

**National Emission Standard for Hazardous Air Pollution (NESHAP):** This engine will be subject to the Reciprocating Internal Combustion Engine (RICE) NESHAP (40 CFR Part 63, Subpart ZZZZ), because it is a RICE located at an area source of HAP emissions. A new RICE at an area source that is subject to and in compliance with the Part 60 Subpart JJJJ NSPS requirements has no further requirements under Subpart ZZZZ pursuant to 40 CFR Part 63.6590(c).

Prevention of Significant Deterioration (PSD) and New Source Performance Standards (NSPS) do not apply.

### **PERMIT CONDITIONS**

Conditions for S-1 Emergency Standby Natural Gas Generator Set, at Plant: 23726

COND# 23107

1. The owner or operator shall operate the stationary emergency standby engine only to mitigate emergency conditions or for reliability-related activities maintenance and testing). Operating while mitigating emergency conditions and while emission testing to show compliance with this part is unlimited. Operating for reliability-related activities is limited to 50 hours per year.

(Basis: Emergency Standby Engines, Hours of Operation Regulation 9-8-330)

2. The Owner/Operator shall equip the emergency standby engine(s) with: a non-resettable totalizing meter that measures hours of operation or fuel usage.

(Basis: Emergency Standby Engines, Monitoring and Record keeping 9-8-530)

3. The Owner/Operator shall not operate unless the natural gas fired engine is abated with a Catalytic Converter/Silencer Unit

(Basis: Cumulative Increase)

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. 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 (maintenance and testing).
- b. Hours of operation for emission testing.
- c. Hours of operation (emergency).
- d. For each emergency, the nature of the emergency condition.
- e. Fuel usage or operating hours for engine.

(Basis: Emergency Standby Engines, Monitoring and Recordkeeping 9-8-530)

**RECOMMENDATION**

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source will be located within 1000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct for the following source:

**S-1 Emergency Standby Generator Set: Natural Gas Engine Make: Generac Power Systems, Inc.; Model: SG070 6.8L; Model Year; 2016; Rated Horsepower: 107 HP; Abated by Three Way Catalyst and Air/Fuel Ratio Control System.**

**EXEMPTIONS**

None.

By: \_\_\_\_\_ Date: 12-12-2016

Sheryl Wallace  
Air Quality Permit Technician

<b>Acronyms</b>			
S-1	Source one	NPOC	Non- Precursor Organic Compound
HP	Horse Power	TBACT	Best Available Control Technology for Toxics
CARB	California Air Resource Board	BACT	Best Available Control Technology

NO <sub>x</sub>	Oxides of Nitrogen as NO <sub>2</sub>	BAAQMD	Bay Area Air Quality Management District
CO	Carbon Monoxide	IC Engines	Internal Combustion Engines
POC	Precursor Organic Compound	EPA	Environmental Protection Agency
HC	Hydrocarbons	SCR	Selective Catalytic Reduction
PM <sub>10</sub>	Particulate Matter	PSD	Prevention of Significant Deterioration
SO <sub>2</sub>	Sulfur Dioxide	NSPS	New Source Performance Standard
O <sub>2</sub>	Oxygen	NESHAPS	National Emission Standard for Hazardous Air Pollutants
ppmv	parts per million by volume	CEQA	California Environmental Quality Act
ATCM	Airborne Toxic Control Measure		