

**DRAFT**  
**ENGINEERING EVALUATION**  
**Safeway**  
**Plant No. 19447**  
**Application No. 19432**

**BACKGROUND**

Safeway of San Mateo 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 860 North Delaware Street, San Mateo, CA 92007.

**S-1 Emergency Standby Generator Set: Natural Gas Engine Make: Ford/Generac; Model: SG035; Model Year; 2009; Rated Horsepower: 61 HP; equipped with 3-way catalyst**

**EMISSIONS**

The 61 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.

**Table (1)**

<b>Component</b>	<b>Emission Factor (g/bhp·hr)</b>
<b>NOx</b>	1.00
<b>CO</b>	0.14
<b>POC</b>	0.06
<b>PM<sub>10</sub></b>	Negligible
<b>SO<sub>2</sub></b>	0.002

**Maximum Emissions in Tons per year:**

**Table (2)**

<b>NOx</b>	=	( 1.0 g/ hp-hr )	( 61 hp )	( 100 hr )	( 454 g/lb )	=	13.2 lb/yr	0.006 TPY
<b>CO</b>	=	( 0.14 g/hp-hr )	( 61 hp )	( 100 hr )	( 454 g/lb )	=	1.88 lb/yr	0.000 TPY
<b>POC</b>	=	( 0.06 g/hp-hr )	( 61 hp )	( 100 hr )	( 454 g/lb )	=	0.80 lb/yr	0.000 TPY
<b>PM10</b>	=	( 0.00 g/hp-hr )	( 61 hp )	( 100 hr )	( 454 g/lb )	=	0.00 lb/yr	0.000 TPY
<b>SO<sub>2</sub></b>	=	( 0.002 g/hp-hr )	( 61 hp )	( 100 hr )	( 454 g/lb )	=	0.026 lb/yr	0.000 TPY

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

**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	=	( 1.00 g/hp-hr )	( 61 hp )	( 24 hr )	( 454 g/lb )	=	3.22 lb/day
CO	=	( 0.14 g/bhp-hr )	( 61 hp )	( 24 hr )	( 454 g/lb )	=	0.45 lb/day
POC	=	( 0.06 g/bhp-hr )	( 61 hp )	( 24 hr )	( 454 g/lb )	=	0.19 lb/day
PM10	=	( 0.00 g/bhp-hr )	( 61 hp )	( 24 hr )	( 454 g/lb )	=	0.00 lb/day
SO2	=	( 0.002 g/bhp-hr )	( 61 hp )	( 24 hr )	( 454 g/lb )	=	0.006 lb/day

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

**Table (4)**

<b>Plant Cumulative Increase</b>			
Pollutant	Existing tons/yr.	New tons/yr.	Total tons/yr.
NOx	0	0.006	0.006
CO	0	0.000	0.000
POC	0	0.000	0.000
PM10	0	Negligible	Negligible
SO <sub>2</sub>	0	0.000	0.000

**Toxic Risk Screening:**

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.

**Appendix A**

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

**Table (5)**

	Compound Name	CATEF Emission Factor lb/MMcf (Fuel Input)	Emission Factor lb/Mmbtu	Calculated Emission (lbs/yr)	Abatement Efficiency	Abated Emissions	TAC Trigger Levels in lb/yr
Trace Organic Compounds							
	<b>1,3-Butadiene</b>	1.05E-01	1.00E-04	5.68E-03	0%	0.01	1.10
	Acetaldehyde	1.82E+00	1.73E-03	9.85E-02	0%	0.10	64.00
	Benzene	1.02E+01	9.71E-03	5.52E-01	0%	0.55	6.40
	<b>Formaldehyde</b>	5.77E+00	5.50E-03	3.12E-01	0%	0.31	30.00
	Naphthalene	8.66E-02	8.25E-05	4.68E-03	0%	0.00	5.30
	<b>PAH</b>	2.54E-07	2.42E-10	1.37E-08	0%	0.00	0.01
	Toluene	2.62E+00	2.50E-03	1.42E-01	0%	0.14	12000.00
	Xylene	7.38E-02	7.03E-05	3.99E-03	0%	0.00	27000.00

insert MMBTU/yr                      5.68E+01

Note: fuel usage is based on 541 scf/hr, 1050 btu/scf, and 100 hr/yr = 56.8 MMBtu/yr

#### **Public Notification:**

**Since this plant is located within 1000 ft of a schools 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 9-1-302. Regulation 9-8-330 and 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"). These engines are not expected to produce visible emissions or fallout in violation of this regulation and they 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.

#### **Best Available Control Technology (BACT):**

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<sub>x</sub>, CO, SO<sub>2</sub> or PM<sub>10</sub>.

Based on the emission calculations above, the owner/operator of S-1 is not subject to BACT. Since the low emissions level is dependent on usage of the abatement device, a condition has been added requiring its use.

**Offsets:** Offsets must be provided for any new or modified source at a facility that emits more than 10 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 Standby Natural Gas Generator Set, at Plant #19447

### **PC 24262**

- 1. The owner/operator shall not operate the engine unless NOx, CO and POC emissions are abated by the 3-Way Catalyst.**

**(Basis: Cumulative Increase)**

- 2. 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 are limited to 100 hours per year. Effective 1/1/2012, the operation for reliability-related activities are limited to 50 hours.**

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

- 3. 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 Recordkeeping 9-8-530)**

- 4. Records: The Owner/Operator shall maintain the following monthly records in a District- approved log for at least 36 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 for engine.**
- f. CARB Certification Executive Order for the engine.**

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

## **RECOMMENDATION**

Issue an Authority to Construct to Safeway for:

**S-1 Emergency Standby Generator Set: Natural Gas Engine Make: Ford/Generac; Model: SG035; Model Year; 2009; Rated Horsepower: 61 HP; equipped with 3-way catalyst**

## **EXEMPTIONS**

None.

By: \_\_\_\_\_ Date: 2/11/09

Sheryl Wallace  
Air Quality Permit Technician

### Acronyms

Acronyms			
S-3	Source three	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
NOx	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		