

**Engineering Evaluation
Safeway Inc.
Application No. 26938
Plant No. 22907**

BACKGROUND

Safeway Inc (Safeway) has applied for a Permit to Operate for the following equipment:

- S-1 Emergency Standby Natural Gas Generator**
Make: Generac, Model: QT045, Model Year 2007
92 bhp, 0.745 MMBtu/hr

The equipment is located at 525 El Camino Real, Menlo Park, CA 94025.

The natural gas fired generator set (S-1) has been operating without a permit since November, 2007 and it provides emergency standby power in the event of a disruption to power service. S-1 is not internally abated.

S-1 is subject to permit condition no. 23112, which is discussed later in this evaluation report.

EMISSIONS CALCULATIONS

The emission factors used to estimate NO_x, POC, and CO emissions from S-1 are based on the engine manufacturer's emissions data. Total hydrocarbons emission rates are assumed to be equal to POC emission rates. POC is assumed to be 5% of THC + NO_x, and NO_x is assumed to be 95% of THC + NO_x.

The emission factors used to estimate SO₂ and PM₁₀ emissions are based on AP 42, Fifth Edition, Volume I, Chapter 3: Stationary Internal Combustion Sources. Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean-burn Engines.

The engine will operate during emergency use and for a maximum of 50 hours per year of testing and maintenance. See Table 1.

Table 1. Annual and Daily Criteria Pollutants Emissions from S-1

Pollutant	Emission Factor	E.F. Unit	Max. Daily Emission (lb/day)	Annual Emission (lb/yr)	Annual Emission (TPY)
NO _x	0.85	g/BHP-hr	4.1	8.6	0.004
POC	0.04	g/BHP-hr	0.2	0.4	~0.000
CO	0.47	g/BHP-hr	2.3	4.8	0.002
PM ₁₀	7.71E-05	lb/MMBtu	0.001	0.003	~0.000
SO ₂	5.88E-04	lb/MMBtu	0.011	0.022	~0.000

PLANT CUMULATIVE INCREASE

Safeway at 525 El Camino Real, Menlo Park, CA 94025 is a new facility. Therefore, the District's database does not contain information on the existing emissions at the plant. Table 2 summarizes the cumulative increase in criteria pollutant emissions that will result at Plant No. 22907 from the operation of S-1.

Table 2. Cumulative Increase Post 4/5/91 in tons/year

Pollutant	Existing	New	Cumulative
NOx	0.000	0.004	0.004
CO	0.000	0.002	0.002

TOXIC RISK SCREENING ANALYSIS

To estimate Toxic Air Contaminants (TACs) emissions from S-1, the higher emission factors of those from EPA AP-42 Table 3.2-2 for natural gas fired 4-stroke lean burn engines and CARB California Air Toxics Emissions Factors (CATEFs) for natural gas fired 4-stroke lean burn engines with less than 650 hp are used. S-1 has a maximum firing rate of 0.745 MMBtu/hr and a maximum rating of 92 hp.

The TAC emission estimates are based on uncontrolled emission factors since S-1 is an unabated engine. As shown in Tables 3 and 4 below, no TACs exceed the District’s Risk Screening trigger levels from Table 2-5-1 in Regulation 2-5. Therefore, a Health Risk Screening Analysis (HRSA) is not required. (Note: According to the “Proposed BAAQMD Air Toxics NSR Program HRSA Guidelines”, an HRSA for the emissions of acrolein will not be conducted.)

Table 3. TAC Emissions from S-1, based on AP-42

Compound		E.F.	E.F. Unit	Hourly Emissions (lb/hr) ¹	Acute Trigger Level (lb/hr)	HRSA Triggered? (Y/N)	Annual Emissions (lb/yr)	Chronic Trigger Level (lb/yr)	HRSA Triggered? (Y/N)
1,1,2,2-Tetrachloroethane	<	4.00E-05	lb/MMBtu	2.98E-05	None	NO	1.49E-03	1.9E+00	NO
1,1,2-Trichloroethane	<	3.18E-05	lb/MMBtu	2.37E-05	None	NO	1.18E-03	6.6E+00	NO
1,1-Dichloroethane	<	2.36E-05	lb/MMBtu	1.76E-05	None	NO	8.79E-04	6.6E+01	NO
1,2,3-Trimethylbenzene		2.30E-05	lb/MMBtu	1.71E-05	None	NO	8.56E-04	None	NO
1,2,4-Trimethylbenzene		1.43E-05	lb/MMBtu	1.06E-05	None	NO	5.32E-04	None	NO
1,2-Dichloroethane	<	2.36E-05	lb/MMBtu	1.76E-05	None	NO	8.79E-04	5.3E+00	NO
1,2-Dichloropropane	<	2.69E-05	lb/MMBtu	2.00E-05	None	NO	1.00E-03	None	NO
1,3,5-Trimethylbenzene		3.38E-05	lb/MMBtu	2.52E-05	None	NO	1.26E-03	None	NO
1,3-Butadiene		2.67E-04	lb/MMBtu	1.99E-04	None	NO	9.94E-03	6.3E-01	NO
1,3-Dichloropropene	<	2.64E-05	lb/MMBtu	1.97E-05	None	NO	9.83E-04	None	NO
2-Methylnaphthalene		3.32E-05	lb/MMBtu	2.47E-05	None	NO	1.24E-03	None	NO
2,2,4-Trimethylpentane		2.50E-04	lb/MMBtu	1.86E-04	None	NO	9.31E-03	None	NO
Acenaphthene		1.25E-06	lb/MMBtu	CATEF		NO	CATEF		NO
Acenaphthylene		5.53E-06	lb/MMBtu	CATEF		NO	CATEF		NO
Acetaldehyde		8.36E-03	lb/MMBtu	CATEF		NO	CATEF		NO
Acrolein		5.14E-03	lb/MMBtu	CATEF		NO	CATEF		NO
Benzene		4.40E-04	lb/MMBtu	CATEF		NO	CATEF		NO
Benzo(b)fluoranthene		1.66E-07	lb/MMBtu	CATEF		NO	CATEF		NO
Benzo(e)pyrene		4.15E-07	lb/MMBtu	3.09E-07	None	NO	1.55E-05	None	NO
Benzo(g,h,i)perylene		4.14E-07	lb/MMBtu	CATEF		NO	CATEF		NO
Biphenyl		2.12E-04	lb/MMBtu	1.58E-04	None	NO	7.89E-03	None	NO
Butane		5.41E-04	lb/MMBtu	4.03E-04	None	NO	2.01E-02	None	NO
Butyr/Isobutyraldehyde		1.01E-04	lb/MMBtu	7.52E-05	None	NO	3.76E-03	None	NO
Carbon Tetrachloride	<	3.67E-05	lb/MMBtu	2.73E-05	4.2E+00	NO	1.37E-03	2.5E+00	NO
Chlorobenzene	<	3.04E-05	lb/MMBtu	2.26E-05	None	NO	1.13E-03	3.9E+04	NO

Chloroethane		1.87E-06	lb/MMBtu	1.39E-06	None	NO	6.96E-05	1.2E+06	NO
Chloroform	<	2.85E-05	lb/MMBtu	2.12E-05	3.3E-01	NO	1.06E-03	2.0E+01	NO
Chrysene		6.93E-07	lb/MMBtu	CATEF		NO	CATEF		NO
Cyclopentane		2.27E-04	lb/MMBtu	1.69E-04	None	NO	8.45E-03	None	NO
Ethane		1.05E-01	lb/MMBtu	7.82E-02	None	NO	3.91E+00	None	NO
Ethyl Benzene		3.97E-05	lb/MMBtu	2.96E-05	None	NO	1.48E-03	4.3E+01	NO
Ethylene Dibromide	<	4.43E-05	lb/MMBtu	3.30E-05	None	NO	1.65E-03	1.5E+00	NO
Fluoranthene		1.11E-06	lb/MMBtu	CATEF		NO	CATEF		NO
Fluorene		5.67E-06	lb/MMBtu	CATEF		NO	CATEF		NO
Formaldehyde		5.28E-02	lb/MMBtu	CATEF		NO	CATEF		NO
Methanol		2.50E-03	lb/MMBtu	1.86E-03	6.2E+01	NO	9.31E-02	1.5E+05	NO
Methylcyclohexane		1.23E-03	lb/MMBtu	9.16E-04	None	NO	4.58E-02	None	NO
Methylene Chloride		2.00E-05	lb/MMBtu	1.49E-05	3.1E+01	NO	7.45E-04	1.1E+02	NO
n-Hexane		1.11E-03	lb/MMBtu	8.27E-04	None	NO	4.13E-02	2.7E+05	NO
n-Nonane		1.10E-04	lb/MMBtu	8.19E-05	None	NO	4.10E-03	None	NO
n-Octane		3.51E-04	lb/MMBtu	2.61E-04	None	NO	1.31E-02	None	NO
n-Pentane		2.60E-03	lb/MMBtu	1.94E-03	None	NO	9.68E-02	None	NO
Naphthalene		7.44E-05	lb/MMBtu	CATEF		NO	CATEF		NO
PAH		2.69E-05	lb/MMBtu	CATEF		NO	CATEF		NO
Phenanthrene		1.04E-05	lb/MMBtu	CATEF		NO	CATEF		NO
Phenol		2.40E-05	lb/MMBtu	1.79E-05	1.3E+01	NO	8.94E-04	7.7E+03	NO
Propane		4.19E-02	lb/MMBtu	3.12E-02	None	NO	1.56E+00	None	NO
Pyrene		1.36E-06	lb/MMBtu	CATEF		NO	CATEF		NO
Styrene	<	2.36E-05	lb/MMBtu	1.76E-05	4.6E+01	NO	8.79E-04	3.5E+04	NO
Tetrachloroethane		2.48E-06	lb/MMBtu	1.85E-06	None	NO	9.23E-05	1.9E+00	NO
Toluene		4.08E-04	lb/MMBtu	CATEF		NO	CATEF		NO
Vinyl Chloride		1.49E-05	lb/MMBtu	1.11E-05	4.0E+02	NO	5.55E-04	1.4E+00	NO
Xylene		1.84E-04	lb/MMBtu	1.37E-04	4.9E+01	NO	6.85E-03	2.7E+04	NO

¹CATEFs are used when AP-42 EFs are less conservative (lower) than CATEFs.

Table 4. TAC Emissions from S-1, based on CATEFs

Substance	E.F. Mean	E.F. Unit	Abated Emissions (lb/hr)	Acute Trigger Level (lb/hr)	HRSA Triggered? (Y/N)	Abated Emissions (lb/yr)	Chronic Trigger Level (lb/yr)	HRSA Triggered? (Y/N)	PAH PEF	PAH Equivalents
Acenaphthene	7.17E-04	lb/MMcf	5.23E-07	None	NO	2.62E-05	None	NO		
Acenaphthylene	7.59E-03	lb/MMcf	5.54E-06	None	NO	2.77E-04	None	NO		
Acetaldehyde	3.99E+00	lb/MMcf	2.91E-03	1.0E+00	NO	1.46E-01	3.8E+01	NO		
Acrolein	1.63E+00	lb/MMcf	1.19E-03	5.5E-03	NO	5.95E-02	1.4E+01	NO		
Anthracene	2.56E-04	lb/MMcf	1.87E-07	None	NO	9.34E-06	None	NO		
Benzene	1.21E+00	lb/MMcf	8.83E-04	2.9E+00	NO	4.42E-02	3.8E+00	NO		
Benzo(a)anthracene	7.78E-05	lb/MMcf	5.68E-08	None	NO	2.84E-06	None	NO		
Benzo(a)pyrene	3.55E-05	lb/MMcf	2.59E-08	None	NO	1.30E-06	None	NO	1.0	1.30E-06
Benzo(b)fluoranthene	3.27E-04	lb/MMcf	2.39E-07	None	NO	1.19E-05	None	NO	0.1	1.19E-06
Benzo(g,h,i)perylene	1.03E-04	lb/MMcf	7.52E-08	None	NO	3.76E-06	None	NO		
Benzo(k)fluoranthene	5.30E-04	lb/MMcf	3.87E-07	None	NO	1.93E-05	None	NO	0.1	1.93E-06
Chrysene	9.64E-05	lb/MMcf	7.04E-08	None	NO	3.52E-06	None	NO	0.01	3.52E-08
Dibenz(a,h)anthracene	1.09E-05	lb/MMcf	7.96E-09	None	NO	3.98E-07	None	NO	1.05	4.18E-07

Fluoranthene	2.50E-04	lb/MMcf	1.83E-07	None	NO	9.13E-06	None	NO		
Fluorene	4.60E-04	lb/MMcf	3.36E-07	None	NO	1.68E-05	None	NO		
Formaldehyde	2.87E+01	lb/MMcf	2.10E-02	1.2E-01	NO	1.05E+00	1.8E+01	NO		
Indeno(1,2,3-cd)pyrene	1.20E-04	lb/MMcf	8.76E-08	None	NO	4.38E-06	None	NO	0.1	4.38E-07
Naphthalene	1.22E-01	lb/MMcf	8.91E-05	None	NO	4.45E-03	3.2E+00	NO		
Phenanthrene	8.93E-04	lb/MMcf	6.52E-07	None	NO	3.26E-05	None	NO		
Propylene	1.87E+01	lb/MMcf	1.37E-02	None	NO	6.83E-01	1.2E+05	NO		
Pyrene	1.23E-04	lb/MMcf	8.98E-08	None	NO	4.49E-06	None	NO		
Toluene	4.12E-01	lb/MMcf	3.01E-04	8.2E+01	NO	1.50E-02	1.2E+04	NO		
Xylene (m,p)	8.63E-02	lb/MMcf	6.30E-05	4.9E+01	NO	3.15E-03	2.7E+04	NO		
Xylene (o)	4.94E-02	lb/MMcf	3.61E-05	4.9E+01	NO	1.80E-03	2.7E+04	NO		
PAH Equivalents as Benzo(a)pyrene							6.9E-03	NO		5.31E-06

NESHAP

S-1 is subject to the emission or operating limitations in 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. Per 40 CFR 63.6590(c)(1), a new or reconstructed stationary RICE located at an area source must meet the requirements of 40 CFR part 60 subpart JJJJ, for spark ignition engines. S-1 is in compliance with the requirements of 40 CFR part 60 subpart JJJJ, as shown in the “NSPS” section of this evaluation.

STATEMENT OF COMPLIANCE

The owner/operator of S-1 shall comply with Regulation 6-1 (*Particulate Matter – General Requirements*) and Regulation 9-1-301 (*Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations*). Pursuant to Regulation 9-1-301, the ground level concentrations of SO₂ shall not exceed 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours.

S-1 is an emergency standby generator. Per Regulation 9-8 (*NO_x and CO from Stationary Internal Combustion Engines*), Section 110.5 (*Emergency Standby Engines*), S-1 is exempt from the requirements of Regulations 9-8-301 (*Emission Limits – Spark-Ignited Engines Powered by Fossil Derived Fuels*), 9-8-302 (*Emission Limits – Spark-Ignited Engines Powered by Waste Derived Fuels*), 9-8-303 (*Emissions Limits – Delayed Compliance, Existing Spark-Ignited Engines, 51 to 250 bhp or Model Year 1996 or Later*), 9-8-304 (*Emission Limits – Compression-Ignited Engines*), 9-8-305 (*Emission Limits – Delayed Compliance, Existing Compression-Ignited Engines, Model Year 1996 or Later*), 9-8-501 (*Initial Demonstration of Compliance*) and 9-8-503 (*Quarterly Demonstration of Compliance*).

Allowable operating hours (50 hours/yr) and the corresponding recordkeeping requirements in Regulations 9-8-330.3 (*Emergency Standby Engines, Hours of Operation*) and 530 (*Emergency Standby and Low Usage Engines, Monitoring and Recordkeeping*) 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 2.3.2)

PSD does not apply.

The facility is less than 1,000 feet from the nearest school and is therefore subject to the public notification requirements of Regulation 2-1-412. A public notice was prepared and sent to all addresses within 1,000 feet of the natural gas generator set and parents and guardians of students of the following school(s):

Lydian Academy,
815 El Camino Real,
Menlo Park, CA 94025

PERMIT CONDITIONS

COND# 23112-----

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

End of Conditions

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 sources will be located within 1,000 feet of at least one school, which triggers the public notification requirements of 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 a Permit to Operate for the following sources:

- S-1 Emergency Standby Natural Gas Generator**
Make: Generac, Model: QT045, Model Year 2007
92 bhp, 0.745 MMBtu/hr

Prepared by: _____

Date: _____

Ying Yu, Air Quality Technician