ENGINEERING EVALUATION REPORT

Plant Name:	**Marin General Hospital**
Application Number:	**27201**
Plant Number:	**1713**

BACKGROUND

The applicant is applying for an Authority to Construct for three new diesel-fired emergency stand-by power generator sets. The applicant is requesting an Authority to Construct for the following equipment:

S-18 Emergency Stand-By Diesel Generator Set; Caterpillar Model C3516C, 2937 BHP

S-19 Emergency Stand-By Diesel Generator Set; Caterpillar Model C3516C, 2937 BHP

S-20 Emergency Stand-By Diesel Generator Set; Cummins Model QSB5-G3, 145 BHP

CRITERIA POLLUTANT EMISSIONS CALCULATIONS

The proposed diesel-fired engines have been not certified by the California Air Resources Board, therefore EPA D-2 5-mode weighted cycle emission factors were used for all criteria pollutant emission calculations. The emission factors used are as follows:

Source(s)	S-18	S-19	S-20
EPA Engine Family	ECPXL78.1NZS	ECPXL78.1NZS	FCEXL0275AAG
CARB Executive Order	N/A	N/A	N/A
PM10 (g/bhp-hr)	0.09	0.09	0.10
POC (g/bhp-hr)	0.19	0.19	0.13
NOx (g/bhp-hr)	3.78	3.78	2.48
SO2 (g/bhp-hr)	0.01	0.01	0.01
CO (g/bhp-hr)	0.70	0.70	0.67

The applicant requested operation at 50 hours per year per engine, which is consistent with the California Air Resources Board Air Toxic Control Measure for Stationary Compression Ignition Engines, 17 CFR 93115, (May 19, 2011).

At a 50 hours per year testing and maintenance limitation for each engine, total application criteria emissions are as follows:

TABLE 1 – CRITERIA POLLUTANT EMISSIONS

SOURCE	BHP	PM10 G/BHP-HR	POC G/BHP-HR	NOX G/BHP-HR	SO2 G/BHP-HR	CO G/BHP-HR
S-18	**2937**	**0.09**	**0.19**	**3.78**	**0.005**	**0.70**
S-19	**2937**	**0.09**	**0.19**	**3.78**	**0.005**	**0.70**
BACT (Tier 2 ATCM limits)		**0.15**	**0.24**	**4.56**	**N/A**	**2.60**
Engines Meet BACT?		**YES**	**YES**	**YES**	**N/A**	**YES**
lb/hr per engine		**0.58**	**1.23**	**24.48**	**0.03**	**4.53**
lb/day per engine		**14.0**	**29.5**	**587.4**	**0.8**	**108.8**
lb/yr per engine		**29.1**	**61.5**	**1223.8**	**1.6**	**226.6**
S-20	**145**	**0.10**	**0.13**	**2.48**	**0.005**	**0.67**
BACT (Tier 2 ATCM limits)		**0.15**	**0.15**	**2.83**	**0.005**	**2.61**
Engine Meets BACT?		**YES**	**YES**	**YES**	**N/A**	**YES**
lb/hr per engine		**0.03**	**0.04**	**0.79**	**0.00**	**0.21**
lb/day per engine		**0.74**	**1.00**	**19.02**	**0.04**	**5.15**
lb/yr per engine		**1.55**	**2.09**	**39.63**	**0.08**	**10.73**
Total lb/hr		**1.20**	**2.50**	**49.74**	**0.07**	**9.28**
Total lb/year		**59.8**	**125.1**	**2487.1**	**3.3**	**464.0**
Total - TPY		**0.030**	**0.063**	**1.244**	**0.002**	**0.232**

Sources S-18 and S-19 trigger BACT for POC, NOx, and CO, and trigger TBACT for PM10
Source S-20 triggers BACT for NOx, and triggers TBACT for PM10

OLD SOURCES: EMISSION REDUCTIONS

The applicant is not planning to shut down any existing sources on start-up of the new sources, therefore no contemporaneous on-site emission reductions were calculated for this application.

OFFSETS

The total Potential to Emit for the facility after start-up of the new source will be less than 100 TPY for each criteria pollutant and less than 10 TPY for each ozone precursor (NO_x and POC) (see Attachment 1).

Since the facility does not have the potential to emit more than 10 tons per year of nitrogen oxide or precursor organic compounds emissions on a pollutant-specific basis, the facility is not subject to NO_x or POC offsets under Regulation 2-2-302.

Since the facility will not have the potential to emit more than 100 tons per year of any criteria pollutant, the facility is not a "Major Facility" as defined in Regulation 2-1-203, and is not subject to PM_{10} or SO_2 offsets under Regulation 2-2-303.

CUMULATIVE EMISSIONS INCREASE

Changes to the cumulative emissions inventory are as follows:

TABLE 3 - CUMULATIVE EMISSION INCREASE INVENTORY

Pollutant	Current Emissions (TPY)	Application Emissions Increase (TPY)	Onsite Emissions Reductions Credits (TPY)	Offsets From DSFB (TPY)	Final Emissions (TPY)
PM10	**0.271**	**0.030**	**0.000**	**0.000**	**0.301**
POC	**0.121**	**0.063**	**0.000**	**0.000**	**0.184**
NOx	**6.550**	**1.244**	**0.000**	**0.000**	**7.794**
SO2	**0.739**	**0.002**	**0.000**	**0.000**	**0.741**
CO	**1.645**	**0.232**	**0.000**	**0.000**	**1.877**

TOXIC RISK MODELING

The District uses PM_{10} emissions as a proxy for toxic emission exposure to surrounding residential and industrial populations. A PM_{10} emissions level of 0.34 lbs/year automatically triggers a health risk screening assessment pursuant to Regulation 2, Rule 5. At the proposed operating rate of 50 hours per year for reliability related testing, this project exceeds a PM_{10} emission level of 0.34 lbs/year and so requires that a health risk screening assessment be performed.

The air dispersion modeling analysis and health risk calculations for this project were conducted in accordance with the District Health Risk Screening Analysis Guidelines using stack paramaters and building dimensions provided by the applicant.

The proposed project results in a maximum projected increased cancer risk of 8.6 chances in a million and a maximum chronic hazard index of 0.006. For students, the increased cancer risk is 0.7 chances in a million, and the chronic hazard index is less than 0.001. As shown in Table 1, each engine will comply with TBACT requirements (Regulation 2-5-301) for stationary emergency standby diesel fired IC engines by having a certified diesel PM emission rate of no more than 0.15 g/bhp-hour. Based on the risk screen results above, the proposed engines are expected to comply with the project risk limits in Regulation 2-5-302, because each engine is meeting TBACT and the maximum project risk is less than 10 in a million cancer risk and less than 1.0 chronic hazard index. The acute hazard index limit is not applicable to this project because diesel PM does not have any OEHHA-approved acute health effects values.

BACT/TBACT REVIEW

Under Regulation 2, Rule 2, any new source which results in an increase of more than 10 lbs per day of any criteria pollutant must be evaluated for adherence to BACT and TBACT control technologies. Sources S-18 and S-19 trigger BACT for POC, CO, and NO_x, and S-20 triggers BACT for NO_x. For compression ignition I.C. engines with firing rates greater than 50 BHP, this means the engines must be fired on ultra-low sulfur diesel fuel (fuel oil with less than 0.0015% by weight sulfur content). BACT/TBACT also requires that the engines meet current tier standards for POC, NO_x, and CO emissions, and meet a PM_{10} emission limitation of no more than 0.15 g/bhp-hr. The proposed engines comply with the applicable Tier standards and meet BACT/TBACT.

PUBLIC NOTIFICATION REQUIREMENTS

The proposed generator sets are located within 1,000 feet of one or more schools providing educational services to students enrolled in kindergarten or grades 1 through 12. Under the California Health and Safety Code §42301.6 and Regulation 2-1-412, notification of the proposed new sources will be mailed to the parents or guardians of all children enrolled in any school within one-quarter mile of the sources, and to each address within a radius of 1,000 feet of the sources, in order to give these parties an opportunity to provide public comment on the proposed actions.

PSD REVIEW

Since the facility will not have the potential to emit more than 100 tons per year of any criteria pollutant, the facility is not a "Major Facility" as defined in Regulation 2-1-203, and is not subject to PSD permitting requirements under Regulation 2-2-304.

TITLE V REVIEW

Since the facility will not have the potential to emit more than 100 tons per year of any criteria pollutant, the facility is not a "Major Facility" as defined in Regulation 2-1-203, and is not subject to Title V permitting requirements under Regulation 2-6-301.

COMPLIANCE DETERMINATION

The generators are covered under ministerial exemption, Chapter 2.3.1 of the BAAQMD Permit Handbook. CEQA is not triggered for emergency standby generators under this provision.

The generators are governed by and comply with the **California Air Resources Board's Air Toxic Control Measure for Stationary Compression Ignition Engines, CCR Title 17, Section 93115.** The explicit annual equipment usage limitation of 50 hours per year per engine except for operations under emergency conditions will be included as part of the permit conditions.

The generators are governed by and comply with the provisions of **Regulation 2, Rule 5, "New Source Review for Toxic Air Contaminants."**

The generators are exempt from the emission limitations of **Regulation 9, Rule 8-305, 8-501, and 8-503**, since they meet the provisions of **Regulation 9, Rule 8-110.5, "Exemptions: Emergency Standby Engines."**

The generators are required to meet NSPS requirements as set out in 40 CFR Part 60, Subpart IIIIG, **Standards of Performance for Stationary Compression-Ignition Internal Combustion Engines, Set G, 2007 and Later Model Non-Fire Pump Emergency Less than 10L per Cylinder**, since the rated engine power is greater than 25 BHP. Under 40 CFR 60.4211(c), the applicant may show compliance by buying and operating engines certified to the emission standards for new non-road CI engines for the same model year and maximum engine power in 40 CFR 89.112 and 40 CFR 89.113 (PM10 emissions less than 0.2 g/kW-hr, NMHC+NOx emissions less than 6.4 g/kW-hr, and CO emissions less than 3.5 g/kW-hr). The generators proposed in this application are certified to these emission levels.

Visible emissions from Sources S-18 and S-19 will be required to meet Ringelmann 1 limitation per **Regulation 6-301**. Visible emissions from Source S-20 will be required to meet Ringelmann 2 limitation per **Regulation 6-303.1**.

Sulfur emissions will be controlled by the requirement that any fuel used in the engines meet California Clean Air fuel content of 0.0015% bw sulfur, as required by the **California Air Resources Board's Air Toxic Control Measure for Stationary Compression Ignition Engines, CCR Title 17, Section 93115.**

CONDITIONS

Condition #22850, setting out the operating conditions and recordkeeping requirements for operations at Sources S-18, S-19 and S-20 shall be made part of those sources' authority to construct/permits to operate.

RECOMMENDATION

The proposed 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 1000 feet of a school, which triggers the public notification requirements of Regulation 2-1-412.

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

S-18 Emergency Stand-By Diesel Generator Set; Caterpillar Model C3516C, 2937 BHP

S-19 Emergency Stand-By Diesel Generator Set; Caterpillar Model C3516C, 2937 BHP

S-20 Emergency Stand-By Diesel Generator Set; Cummins Model QSB5-G3, 145 BHP

subject to Condition #22850.

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By _____ **Date** _____

Catherine S. Fortney

COND# 22850 ----------

1. The owner/operator shall not exceed 50 hours per year per engine for reliability-related testing.
[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3) or (e)(2)(B)(3)]

2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited.
[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3) or (e)(2)(B)(3)]

3. 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: "Stationary Diesel Engine ATCM" section 93115,title 17, CA Code of Regulations,subsection(e)(4)(G)(1)]

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 (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: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(I), (or, Regulation 2-6-501)]

5. At School and Near-School Operation:
If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall apply:
The owner/operator shall not operate each stationary

emergency standby diesel-fueled 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)
b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session.

"School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, athletic field, or other areas of school property but does not include unimproved school property.

[Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(1)] or (e)(2)(B)(2)]

ATTACHMENT 1
FACILITY-WIDE POTENTIAL TO EMIT

SOURCE	S CODE	SOURCE DESCRIPTION	THRUPUT	UNITS	COND	APPLIC	PM10 (lb/yr)	POC (lb/yr)	NPOC (lb/yr)	NOX (lb/yr)	SO2 (lb/yr)	CO (lb/yr)
6	C1350189	Hot Water Boiler[1,2]	4	MMBTU/hr	6333	7086	261.08	188.94	106.49	382.71	206.12	2588.93
7	C1350189	Hot Water Boiler[1,2]	4	MMBTU/hr	6333	7086	261.08	188.94	106.49	382.71	206.12	2588.93
8	C1260189	High Pressure Steam Boiler	0.398	MMBTU/hr	Exempt	7086	25.98	18.80	10.60	341.81	20.51	287.12
9	C1260189	High Pressure Steam Boiler[3]	0.398	MMBTU/hr	Exempt	7086	25.98	18.80	10.60	341.81	20.51	287.12
10	C1260189	High Pressure Steam Boiler[3]	0.398	MMBTU/hr	Exempt	7086	25.98	18.80	10.60	341.81	20.51	287.12
11	C1260189	High Pressure Steam Boiler[3]	0.398	MMBTU/hr	Exempt	7086	25.98	18.80	10.60	341.81	20.51	287.12
12	C1350189	Low Pressure Steam Boiler[1,2]	4.99	MMBTU/hr	16335	19410	325.70	235.70	132.85	477.43	257.13	3229.69
13	C1350189	Low Pressure Steam Boiler[1,2]	4.99	MMBTU/hr	16335	19410	325.70	235.70	132.85	477.43	257.13	3229.69
14	C1350189	Low Pressure Steam Boiler[1,2]	4.99	MMBTU/hr	16335	19410	325.70	235.70	132.85	477.43	257.13	3229.69
15	C1350189	Low Pressure Steam Boiler[1,2]	4.99	MMBTU/hr	16335	19410	325.70	235.70	132.85	477.43	257.13	3229.69
16	C2250098	Standby Diesel Generator[4]	940	BHP	22820	5732	26.11	13.24		451.20	0.23	103.40
17	C2250098	Standby Diesel Generator[4]	940	BHP	22820	5732	26.11	13.24		451.20	0.23	103.40
18	TBD	Standby Diesel Generator[5]	2937	BHP	22850	27201	29.14	61.51		1223.75	1.62	226.62
19	TBD	Standby Diesel Generator[5]	2937	BHP	22850	27201	29.14	61.51		1223.75	1.62	226.62
20	TBD	Standby Diesel Generator[5]	145	BHP	22850	27201	1.55	2.08		39.62	0.08	10.72
					TOTAL	LB/YEAR	2,010	1,484	787	6,169	1,525	19,679
						TPY	1.005	0.742	0.393	3.084	0.762	9.839
					TOTAL FACILITY PTE =		15.83	TPY				

[1] Excluding diesel back-up fuel usage

[2] NOx and CO emissions based on BACT limits of 25 ppmv and 100 ppmv respectively. Other emissions from AP 42, Table 1.4-2.

[3] All emissions from AP 42, Table 1.4-2.

[4] Limited to 20 hours per year operation; 0.0015 ppm sulfur fuel

[5] Limited to 50 hours per year operation; 0.0015 ppm sulfur fuel