ENGINEERING EVALUATION
Kaiser Hospital
Plant: 20428
Application: 22622

2500 Merced Street, San Leandro, CA 94577

BACKGROUND

Kaiser Hospital has applied to obtain an Authority to Construct (AC) and/or a Permit to Operate (PO) for the following equipments:

S-1 Emergency Standby Diesel Generator Set
MTU Detroit Diesel, Model: 12V4000G83, 2561BHP, 16.85MMBTU/hr
S-2 Emergency Standby Diesel Generator Set
MTU Detroit Diesel, Model: 12V4000G83, 2561BHP, 16.85MMBTU/hr
S-3 Emergency Standby Diesel Generator Set
MTU Detroit Diesel, Model: 12V4000G83, 2561BHP, 16.85MMBTU/hr
S-4 Natural Gas Fired Boiler #1
Cleaver-Brook, Model: FLX-1000, 10MMBTU/hr
Equipped with Industrial Combustion NTH 15 ppm Low NOx Burners
S-5 Natural Gas Fired Boiler #2
Cleaver-Brook, Model: FLX-1000, 10MMBTU/hr
Equipped with Industrial Combustion NTH 15 ppm Low NOx Burners
S-6 Natural Gas Fired Boiler #3
Cleaver-Brook, Model: FLX-1000, 10MMBTU/hr
Equipped with Industrial Combustion NTH 15 ppm Low NOx Burners
S-7 Natural Gas Fired Boiler #4
Cleaver-Brook, Model: FLX-1000, 10MMBTU/hr
Equipped with Industrial Combustion NTH 15 ppm Low NOx Burners

The Emergency Diesel Engine Generator Sets (S-1, S-2, and S-3) are equipped with the best available control technology (BACT) for minimizing the release of air borne criteria pollutants and harmful air toxins due to fuel combustion. The criteria pollutants are nitrogen oxides (NOx), carbon monoxide (CO), precursor organic compounds (POC) from unburned diesel fuel, sulfur dioxide (SO2) and particulate matter (PM10). POC is also denoted as Non-Methane Hydrocarbon (NMHC). All of these pollutants are briefly discussed on the District's web site at www.baaqmd.gov.

The engines meet the Environmental Protection Agency and California Air Resources Board (EPA/CARB) Tier 2 Off-road standard. The engines will burn commercially available California low sulfur diesel fuel. The sulfur content of the diesel fuel will not exceed 0.0015% by weight.

The Natural Gas Fired Boilers (S-4, S-5, S-6, S-7) are fired by an ultra-low NOx burner manufactured by Industrial Combustion. The burner has FGR (Flue Gas Recirculation) on natural gas at 15% recirculation. Kaiser Hospital will utilize the Boilers to provide space heat in the hospital.

EMISSIONS

S-1, S-2, and S-3 have been certified by CARB to be a cleaner burning engine. Except for SO2, the emission factors for these engines are from the CARB Certification (CARB Executive Order # U-R-052-0014).

Basis:
For S-1, S-2, and S-3
2561 hp output rating
50 hr/yr operation for testing and maintenance
123 gallons/hr max fuel use rate

S-1, S-2, and S-3 are in the same engine family, so for S-1, S-2, and S-3, NMHC + NOx, CO and PM10 emission factors provided by CARB Certification with Executive Order U-R-052-0014
POC is assumed to be 5% of NMHC + NOx
NOx is assumed to be 95% of NMHC + NOx
SO2 emissions are quantified based on the full conversion of 0.0015 wt% (~ 15 ppm) sulfur in the ULS diesel fuel. The SO2 emission factor was derived from EPA AP-42, Table 3.4-1.

For S-4, S-5, S-6, and S-7
Operating schedule of 24 hr/day, 7 day/week, 52 week/yr
Maximum firing rate of 10 MMBTU/hr
Fuel heat value of 1,020 BTU/SCF, from AP-42, 5th Ed., Chapter 1.4 Natural Gas Combustion
NOx, POC, CO, SO_2 and PM_{10} emission factors from vendor ppm specifications:

- NOx: 15 ppm at 3% O_2 or 0.0176 lb/MMBtu
- POC: 10 ppm at 3% O_2 or 0.004 lb/MMBtu
- CO: 100 ppm at 3% O_2 or 0.073 lb/MMBtu
- SO_2: 0.4 ppm at 3% O_2 or 0.006 lb/MMBtu
- PM_{10}: 0.006 lb/MMBtu

Annual Emissions:
Annual emissions are calculated based on the number of hours per year of operation for testing and maintenance.

Daily Emissions:
Daily emissions are calculated to establish whether a source triggers the requirement for BACT (10 lb/highest day total source emissions for any class of pollutants). 24-hr/day of operation will be assumed since no daily limits are imposed on intermittent and unexpected operations.

Table 1- Estimated emissions operation of S-1

Pollutant	Emission Factor (g/kw-hr)	Emission Factor (g/hp-hr)	Annual Emissions (lb/yr)	Annual Emissions (TPY)	Max. Daily (lb/day)
NMHC+NOx	5.9	4.40			
NOx	5.61	4.18	1179.34	0.5897	566.08
POC	0.30	0.22	62.07	0.0310	29.79
CO	1.9	1.42	399.78	0.1999	191.89
PM10	0.2	0.15	42.08	0.0210	20.20
SO2		0.001515 *lb SO2/MMBTU	1.28	0.00064	0.61

Table 2- Estimated emissions operation of S-2

Pollutant	Emission Factor (g/kw-hr)	Emission Factor (g/hp-hr)	Annual Emissions (lb/yr)	Annual Emissions (TPY)	Max. Daily (lb/day)
NMHC+NOx	5.9	4.40			
NOx	5.61	4.18	1179.34	0.5897	566.08
POC	0.30	0.22	62.07	0.0310	29.79
CO	1.9	1.42	399.78	0.1999	191.89
PM10	0.2	0.15	42.08	0.0210	20.20
SO2		0.001515 *lb SO2/MMBTU	1.28	0.00064	0.61

Table 3- Estimated emissions operation of S-3

Pollutant	Emission Factor (g/kw-hr)	Emission Factor (g/hp-hr)	Annual Emissions (lb/yr)	Annual Emissions (TPY)	Max. Daily (lb/day)
NMHC+NOx	5.9	4.40			
NOx	5.61	4.18	1179.34	0.5897	566.08
POC	0.30	0.22	62.07	0.0310	29.79
CO	1.9	1.42	399.78	0.1999	191.89
PM10	0.2	0.15	42.08	0.0210	20.20
SO2		0.001515 *lb SO2/MMBTU	1.28	0.00064	0.61

Table 4-Estimated emissions operation of S-4

Pollutant	Emission Factor (lb/MMbtu)	Max. Daily (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (TPY)
NOx	0.0176	4.224	1541.76	0.771
POC	0.004	0.96	350.4	0.175
CO	0.073	17.52	6394.8	3.197
PM10	0.006	1.44	526.6	0.263
SO2	0.006	1.44	526.6	0.263

Table 5-Estimated emissions operation of S-5

Pollutant	Emission Factor (lb/MMbtu)	Max. Daily (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (TPY)
NOx	0.0176	4.224	1541.76	0.771
POC	0.004	0.96	350.4	0.175
CO	0.073	17.52	6394.8	3.197
PM10	0.006	1.44	526.6	0.263
SO2	0.006	1.44	526.6	0.263

Table 6-Estimated emissions operation of S-6

Pollutant	Emission Factor (lb/MMbtu)	Max. Daily (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (TPY)
NOx	0.0176	4.224	1541.76	0.771
POC	0.004	0.96	350.4	0.175
CO	0.073	17.52	6394.8	3.197
PM10	0.006	1.44	526.6	0.263
SO2	0.006	1.44	526.6	0.263

Table 7-Estimated emissions operation of S-7

Pollutant	Emission Factor (lb/MMbtu)	Max. Daily (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (TPY)
NOx	0.0176	4.224	1541.76	0.771
POC	0.004	0.96	350.4	0.175
CO	0.073	17.52	6394.8	3.197
PM10	0.006	1.44	526.6	0.263

SO2	0.006	1.44	526.6	0.263

PLANT CUMULATIVE INCREASE

Table 8 summarizes the cumulative increase in criteria pollutant emissions that will result from the operation of S-1, S-2, S-3, S-4, S-5, S-6, and S-7

Table 8

Pollutant	Current plant emissions (TPY)	Increase in plant emissions associated with this application (TPY)	Cumulative emissions (Current + Increase) (TPY)
NOx	0	4.852	4.852
POC	0	0.793	0.793
CO	0	13.388	13.388
PM10	0	1.115	1.115
SO2	0	1.115	1.115

TOXIC RISK SCREENING ANALYSIS

S-1, S-2, and S-3 require a Toxics Risk Screen because the diesel particulate emissions are greater than the toxic trigger level.

Table 9 – Toxic Risk Screening for Diesel

Toxic Pollutant Emitted	Emission Rate (lb/yr)	Risk Screening Trigger (lb/yr)	Does Risk Screening Trigger
PM10 (Diesel Particulate) from S-1	13.81	0.34	Yes
PM10 (Diesel Particulate) from S-2	13.81	0.34	Yes
PM10 (Diesel Particulate) from S-2	13.81	0.34	Yes

Toxics Risk Screening is not required for S-4, S-5, S-6, and S-7 since the emissions are lower than the toxic trigger level.

Table 10. Toxic Air Contaminant (TAC) emissions and trigger levels

TACs from Natural Gas Combustion	AP-42 Emission Factor	Emission Factor	Annual Emission Rate	TAC Trigger Level	Triggered?	Hourly Emission Rate	TAC Trigger Level	Triggered?
	lb/MM cu. ft.	lb/MMBtu	lb/yr	lb/yr	yes/no	lb/hr	lb/hr	yes/no
Benzene	2.10E-03	2.1E-06	1.84E-01	3.8E+00	No	2.1E-05	2.9E+00	No
Formaldehyde	7.50E-02	7.4E-05	6.48E+00	1.8E+01	No	7.4E-04	1.2E-01	No
Toluene	3.40E-03	3.3E-06	0.289E-01	1.2E+04	No	3.3E-05	8.2E+01	No

Note: Based on September 7, 2005 Memorandum from Brian Bateman (Subject: Emission Factors for Toxic Air Contaminants from Miscellaneous Natural Gas Combustion Sources)

S-1, S-2, and S-3 meet Best Available Control Technology for toxics (TBACT) since the diesel particulate emissions are less than 0.15 g/bhp-hr. For an engine that meets the TBACT requirement, it must also pass the toxic risk screening level of less than ten in a million. Estimates of residential risk assume exposure to annual average toxic air contaminant concentrations occur 24 hours per day, 350 days per year, for a 70-year lifetime. Risk estimates for offsite workers assume exposure occurs 8 hours per day, 245 days per year, for 40 years. Risk estimates for students assume a higher breathing rate, and exposure is assumed to occur 10 hours per day, 36 weeks per year, for 9 years.

Based on 50 hrs/yr of operation, the source poses no significant toxic risk, since the increased cancer risk to the maximally exposed receptor (worker) is 3.3 in a million with a hazard index for of 0.003. The increased cancer risk

to residents is 1.9 in a million with a hazard index of 0.002. The increased risk to students at Lincoln High School is 0.03 in a million. In accordance with the District's Regulation 2, Rule 5, this risk level is considered acceptable, as it has been determined that S-1, S-2, and S-3 meet the current TBACT standards.

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, NOx, CO, SO_2 or PM_{10}.

1) S-1, S-2, and S-3

BACT is triggered for NOx, POC, PM10,and CO for both S-1, S-2, and S-3 since the maximum daily emissions of these pollutants exceeds 10 lb/day. Please refer to the discussion on "Daily Emissions" in page 2 of this evaluation. BACT for these sources are presented in the current BAAQMD BACT/TBACT Workbook for IC Engine – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump, Document # 96.1.3, Revision 6 dated 4/13/2009. For NOx, POC, CO, and PM10, BACT(2) is the current off-road tier standard for the horsepower. BACT(1) has not been determined.

Source Category

Source:	***IC Engine – Compression Ignition: Stationary Emergency, non-Agricultural, non-direct drive fire pump***	**Revision:**	***6***
		Document #:	***96.1.3***
Class:	***> 50 BHP Output***	**Date:**	***04/13/2009***

POLLUTANT	BACT 1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	TYPICAL TECHNOLOGY
POC	*1. n/s[d]* *2. Current tier[a,b] standard for POC at applicable horsepower rating.*	*1. n/s[d]* *2. Any engine certified or verified to achieve the applicable standard.[a,b]*
NOx	*1. n/s[d]* *2. Current tier[a,b] standard for NOx at applicable horsepower rating.*	*1. n/s[d]* *2. Any engine certified or verified to achieve the applicable standard.[a,b]*
SO_2	*1. n/s[d]* *2. Fuel sulfur content not to exceed 0.0015% (wt) or 15 ppm.*	*1. n/s[d]* *2. CARB Diesel Fuel (Ultra Low Sulfur Diesel).*
CO	*1. n/s[d]* *2. The more stringent of either 2.75 g/bhp-hr [319 ppmvd @ 15% O_2][c] or the current Tier[a,b] standard.*	*1. n/s[d]* *2. Any engine certified or verified to achieve the applicable standard.*
PM_{10}	*1. n/s[d]* *2. More stringent of either 0.15 g/bhp-hr or the current Tier standard.* *3. TBACT: The more stringent of*	*1. n/s[d]* *2. Any engine or technology demonstrated, certified or verified to achieve the applicable standard.* *3. Any engine or technology demonstrated, certified or verified to achieve the applicable standard.*

	either 0.15 g/bhp-hr or the current Tier standard.	
NPOC	*1. n/s* *2. n/s*	*1. n/s* *2. n/s*

References

a. Current tier standard (listed on http://www.baaqmd.gov/pmt/bactworkbook/96-1-2.pdf): The current CARB or EPA off-road tier standard for the pollutant of concern within the appropriate horsepower range. Where NMHC + NOx is listed (with no individual standards for NOx or NMHC) as the standard, the portions may be considered 95% NOx and 5% NMHC. For the purposes of determining BACT NMHC = POC. Any engine which has been certified or demonstrated to meet the current year tier standard may be considered a current certified engine for that pollutant.

b. For pollutants NOx, POC and CO, an engine which does not meet the current EPA or CARB off-road tier standard may represent BACT2, providing 1) the engine met the most stringent EPA Tier Standard in effect at the time of installation (Tier 1 minimum) or 2) the engine met the most stringent EPA Tier Standard in effect prior to the Tier change for that horsepower rating with the permit application submitted within 6 months of the effective date of the Tier change. [Source: California Health & Safety Code Section 93116.3(b)(7)]

c. Previous BACT determination dated 01/11/02.

d. Cost effectiveness analysis must be based on lesser of 50 hr/yr or as limited by toxic risk screen.

From the table below, S-1, S-2, and S-3 satisfy the current BACT(2) standards for NOx, POC, CO, and PM10.

Table 11

	S-1 emissions g/bhp-hr	S-2 emissions g/bhp-hr	S-3 emissions g/bhp-hr	BACT requiremets g/bhp-hr
NOx	4.18	4.18	4.18	4.56
NMHC (POC)	0.22	0.22	0.22	0.24
CO	1.42	1.42	1.42	2.6
PM_{10}	0.15	0.15	0.15	0.15

2) S-4, S-5, S-6 and S-7

BACT is triggered for S-4, S-5, S-6, and S-7 for CO since the CO emission exceeds 10 lb/day.
BACT for these sources are presented in the current BAAQMD BACT/TBACT Workbook for Boiler, Document # 17.1.1, Revision 4 dated 08/04/2010.

For CO, BACT(1) requires 50 ppmv @ 3% O_2 Dry, and BACT(2) requires 50 ppmv @ 3% O_2 Dry for Firetube Boilers, 100 ppmv @ 3% O2 Dry, for Watertube Boilers.

S-4, S-5, S-6 and S-7 are Watertube Boilers and they emit 100ppmv of CO, so they are in compliance of BACT(2). BACT(1) is not applicable because there is no Cost Effective Standard for CO emission specified in the BACT/TBACT workbook.

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 per Regulation 2-2-302. Table 4 summarizes the increase in criteria pollutant emissions that will result from the operation of S-1, S-2, and S-3.

Table 7

Pollutant	Current plant emissions (TPY)	Increase in plant emissions associated with this application (TPY)	Cumulative emissions (Current + Increase) (TPY)	Regulation 2-2-302 and 2-2-303 Offset Triggers (TPY)
NOx	0	4.852	4.852	> 10; < 35
POC	0	0.793	0.793	> 10; < 35
CO	0	13.388	13.388	NA
PM10	0	1.115	1.115	> 1*
SO2	0	1.115	1.115	> 1*

*Applies to major facilities with a cumulative increase, minus contemporaneous emission reduction credits, in excess of 1 ton/year since April 5, 1991.

It can be seen from Table 4 above that S-1, S-2, and S-3 do not trigger any offset. Therefore, offsets are not warranted for any emission.

NSPS

The engines are subject to 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines because it was manufactured after April 1, 2006, as required by Section 60.4200(a)(2)(i).

Each of the engines S-1, S-2, S-3 has a total displacement of 60.1 liters and has 16 cylinders, so each cylinder has a volume of less than 10 liters. Section 60.4205(b) requires these engines to comply with the emission standards in Section 60.4202, which refers to 40CFR89.112 and 40CFR89.113 for all pollutants. For engines greater than 750, these standards are:

NMHC+NOx: 4.77 g/hp-hr
CO: 2.61 g/hp-hr
PM: 0.15 g/hp-hr
20% opacity during acceleration mode
15% opacity during lugging mode
50% opacity during peaks in acceleration or lugging mode

According to CARB Executive Order U-R-052-0014, the engines (S-1, S-2, and S-3) will comply with the standards.

Sections 60.4206 and 60.4211(a) require that the owner/operator operate and maintain the engines according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine. The owner/operator is expected to comply with this requirement.

Section 60.4207(a) requires that by October 1, 2007, the owner/operator must use fuel that complies with 40 CFR 80.510(a). This means that the fuel must have a sulfur content of 500 parts per million (ppm) maximum, a cetane index of 40 or a maximum aromatic content of 35 volume percent. The owner/operator is expected to comply with this requirement because CARB diesel is required to be used in California.

Section 60.4207(b) requires that by October 1, 2010, the owner/operator must use fuel that complies with 40 CFR 80.510(b). This means that the fuel must have a sulfur content of 15 parts per million (ppm) maximum, and the same cetane index or aromatic content as above. The owner/operator is expected to comply with this requirement because CARB diesel is required to be used in California.

Section 60.4209(a) requires a non-resettable hour meter. This requirement is already in the standard permit conditions.

The engine will comply with the requirements of Section 60.4211(c) because it has been certified in accordance with 40 CFR Part 89.

The engine will comply with the requirement in Section 60.4211(e) to run for less than 100 hours per year for maintenance checks and readiness testing, and the prohibition of running for any reason other than emergency operation, maintenance, and testing because they are limited by permit condition to 50 hours per year for reliability testing and otherwise may only operate for emergencies.

The owner/operator is not required to perform tests in accordance with Section 60.4212 or 60.4213.

Section 60.4214 states that owner/operators do not have to submit an initial notification to EPA for emergency engines.

Because the engine does not have a diesel particulate filter, the owner/operator is not subject to Section 60.4214(c).

The owner/operator is required to comply with certain sections of 40 CFR 60, Subpart A, General Provisions. The owner/operator is expected to comply with this requirement.

NESHAP

This engine is not 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, because it is an emergency stationary reciprocating internal combustion engine (40 CFR 63.6600(c)).

CARB STATIONARY DIESEL ENGINE ATCM

The State Office of Administrative Law approved the Airborne Toxic Control Measure (ATCM) on November 8, 2004. State law requires the local Air Districts to implement and enforce the requirements of the ATCM. Effective January 1, 2005, there is a prohibition on the operation of new diesel emergency standby engines greater than 50 bhp unless the following operating requirements and emission standards are met:

"Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations.

Diesel PM – General Requirements

1. Meet 0.15 g/bhp-hr PM standard
2. Operate 50 hours per year, or less, for maintenance and testing (except emergency use and emissions testing)

or

1. Meet 0.01 g/bhp-hr PM standard
2. Operate up to 100 hours per year for maintenance and testing (except emergency use and emissions testing), upon approval by the District.

HC,NOx, NMHC+NOx, CO

1. Meet standards for off-road engines of the same model year and horsepower rating as specified in the OFF-Road Compression Ignition Engine Standards;
   or if no standards have been established
2. Meet the Tier 2 standards for an off-road engine for the same maximum rated power.

This emergency standby diesel engines (S-1, S-2, S-3)) are in compliance with the above ATCM requirements. The diesel engine will operate for no more than 50 hours per year for maintenance and reliability testing. This engine is subject to the Tier 2 off-road CI engine standards for HC, NOx, NMHC+NOx and CO. As shown in the Table 5, the engines meet these requirements.

Table 6. ATCM Tier 2 Compliance (GEN> 750BHP)

	CARB Certified for S-1(g/bhp-hr)	CARB Certified for S-2(g/bhp-hr)	CARB Certified for S-3(g/bhp-hr)	ATCM Tier 2 g/bhp-hr
NMHC+NOx	4.03	4.03	4.03	4.8
NOx	3.83	3.83	3.83	N/A
NMHC (POC)	0.20	0.20	0.20	N/A
CO	0.37	0.37	0.37	2.6
PM	0.067	0.067	0.067	0.15

STATEMENT OF COMPLIANCE

S-1, S-2, S-3 will be operated as an emergency standby engine and therefore is not subject to the emission rate limits in Regulation 9, Rule 8 ("NOx and CO from Stationary Internal Combustion Engines"). S-1, S-2, and S-3 are exempt from the requirements of Sections 9-8-301 through 305, 501 and 503 per Reg. 9-8-110.5 (Emergency Standby Engines). S-1, S-2, and S-3 are subject to and expected to comply with 9-8-330 (Emergency Standby Engines, Hours of Operation) since non-emergency hours of operation will be limited in the permit conditions to 50 hours per year. S-1, S-2, and S-3 is also subject to and expected to comply with monitoring and record keeping requirements of Regulation 9-8-530 and the SO2 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. Compliance with Regulation 9, Rule 1 is very likely since diesel fuel with a 0.0015% by weight sulfur is mandated for use in California. Like all combustion sources, S-1, S-2, and S-3 are subject to Regulation 6, Rule 1 ("Particulate Matter"). Regulation 6-1-303.1 limits opacity from internal combustion engines to Ringelmann 2. This engine is not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to be in compliance with Regulation 6-1.

The owner/operator of S-4, S-5, S-6, and S-7, Natural Gas Fired Boilers shall comply with Regulation 6-1 (Particulate Matter: General Requirements), Regulation 9-1-301 (Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations), and Regulation 9-7 (Inorganic Gaseous Pollutants: Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters).

The owner/operator of S-4, S-5, S-6, and S-7 is subject to and expected to comply with Regulation 6 since the unit is fueled with natural gas. Thus, for any period aggregating more than three minutes in any hour, there shall be no visible emission as dark or darker than No. 1 on the Ringlemann Chart (Regulation 6-1-301) and no visible emission equal to or greater than 20% opacity (Regulation 6-1-302). Sulfur oxides are also very low since natural gas is being used to fire the boiler. Therefore, the owner/operator of S-1 is subject to and expected to comply with Regulation 9-1-301, which limits the ground level concentration of SO_2 to 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-4, S-5, S-6, and S-7 are also subject to and expected to comply with the following requirements of Regulation 9-7:

- The limits of 15 ppmv for NOx and 400 ppmv for CO, both at 3% O_2, of Regulation 9-7-307.3. The actual NOx and CO emissions from S-4, S-5, S-6, and S-7 at 3% O_2 are 15 ppmv and 100 ppmv, respectively. Since S-1 complies with Regulation 9-7-307, S-1 is not subject to Regulation 9-7-301.
- Compliance schedule requirement of Regulation 9-7-308, which states that 100% of devices at a facility shall comply with Regulation 9-7-307 effective two years after January 1, 2012 or January 1, 2014. The facility complies with Regulation 9-7-307 since the emissions from S-4, S-5, S-6, and S-7 complies 9-7-307.3.
- Insulation requirement of Regulation 9-7-311, which states effective January 1, 2010, no person shall operate a boiler or steam generator unless the exposed, external surface of the device, including all pipes and ducts heated by the device, does not exceed a temperature of 120ºF. The applicant has confirmed that the boiler and pipes at S-4, S-5, S-6, and S-7 are insulated and comply with Regulation 9-7-311.

- Tune-up requirements of Regulation 9-7-313, which states effective January 1, 2009, no person shall operate a boiler, steam generator or process heater unless they do at least one of the following each calendar year:
  - Operate at less than 10% of its annual maximum heat capacity during the calendar year, per Section 313.1; or
  - Perform an inspection and tune-up at least once per calendar year by a technician in accordance with the procedure specified in Section 9-7-604, per Section 313.2.

  The applicant has confirmed that S-1 will comply with Regulation 9-7-313.2.
- Initial demonstration of compliance requirement of Regulation 9-7-403, which states no person shall operate a boiler, steam generator or process heater that is subject to the requirements of Sections 9-7-307.3, 307.4, 307.5, 307.6 or 309.1 unless an initial source test to verify compliance with these requirements is conducted in accordance with Sections 9-7-601 or 602 within 1 year of the date these requirements are effective. Alternatively, devices subject to Sections 9-7-307.3, 307.4 or 309.1 may be tested using a portable analyzer that meets the specification standards and using the testing protocol in Attachment 1 of Regulation 9-7.

Permit condition will be imposed to assure compliance with the above applicable requirements.

This application is considered to be ministerial under the District's 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 emission factors in accordance with Permit Handbook Chapter 2.3.

This facility is greater than 500 feet and less than 1,000 feet from the nearest school and therefore is subject to the public notification requirements of Regulation 2-1-412. A public notice was prepared and sent to:

All addresses within 1000 feet of the diesel generator set.

Parents and guardians of students of
Lincoln High School
2600 Teagarden Street
San Leandro, CA 94577

PSD is not triggered.

PERMIT CONDITIONS

S-1, S-2, S-3 are subject to Condition #22850

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, playground, 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)]

S-4, S-5, S-6, and S-7 are subject to Condition #24825

S-4 Natural Gas Fired Boiler #1
S-5 Natural Gas Fired Boiler #2
S-6 Natural Gas Fired Boiler #3
S-7 Natural Gas Fired Boiler #4

Application 22622 (Oct 2010)

1. The owner/operator of S-4, S-5, S-6 and S-7 shall not operate this source unless the boiler is fired by Industrial Combustion NTH 15 ppm Low NOx Burners. (Basis: Cumulative Increase)
2. The owner/operator of S-4, S-5, S-6 and S-7 shall operate this source exclusively on natural gas fuel at a firing rate not to exceed 10 MMBtu/hr. (Basis: Cumulative Increase)
3. Emissions of carbon monoxide (CO) from S-4, S-5, S-6 and S-7 shall not exceed the following emission concentrations when using natural gas as a fuel:
   100 ppmv, dry at 3% O_2 for CO
   (Basis: Cumulative Increase)
4. The owner/operator shall not use more than 876,000 therms of natural gas fuel at any of the boilers S-4, S-5, S-6 and S-7 in any consecutive twelve-month period. (Basis: Cumulative Increase)
5. Visible particulate emissions from S-4, S-5, S-6 and S-7 shall not be as dark as or darker than No. 1 on Ringlemann Chart for a period or periods aggregating more than three minutes in any hour. (Basis: Regulation 6-301)
6. The limits specified in Part 3 shall not apply during startup periods not exceeding four hours and shutdown periods not exceeding two hours for source S-4, S-5, S-6 and S-7. (Basis: Regulation 2-1-403)

"Startup" shall mean that period of time during which the piece of equipment in question is put into normal operation from an inactive status by following a prescribed series of separate steps or operations, not to exceed 4 hours. (Basis: Regulation 2-1-403)

"Shutdown" shall mean that period of time during which the piece of equipment in question is taken out of service from a normal operating mode to an inactive status following a prescribed series of separate steps of operations, not to exceed 2 hours. (Basis: Regulation 2-1-403)

7. To determine compliance with the above conditions, the owner/operator shall maintain the following records in District-approved logs and provide all of the data necessary to evaluate compliance with the above conditions, including the following information:
    a. Monthly records of the quantity of natural gas (therms) burned at S-4, S-5, S-6, and S-7.
    b. Monthly records of the number and duration (hours) of shutdowns and startups.
    c. Monthly records shall be totaled for each consecutive 12-month period.

    These logs shall be retained on-site for at least two years, from the date of entry, and shall be made available to the District upon request. (Basis: Cumulative Increase)
8. In order to demonstrate compliance with Part 3, the owner/operator shall perform a District-approved source test within 30 days of startup, in accordance with Regulation 9-7-601 or 602. Alternatively, the owner/operator may fulfill this requirement by using a portable analyzer that meets the specification standards and using the testing protocol in Attachment 1 of Regulation 9-7. The owner/operator shall notify the Manager of the District's Source Test Section at least seven days prior to the test to provide the District staff the option of observing the testing. Within 45 days of test completion, a comprehensive report of the test results shall be submitted to the Manger of the Source Test Section for review and disposition. (Basis: Regulation 9-7-403, Regulation 2-1-403). This A/C startup Part 8 will be deleted upon issuance of the Permit to Operate.

End of Conditions

RECOMMENDATION

Issue an Authority to Construct to **Kaiser Hospital** for:

S-1 Emergency Standby Diesel Generator Set
MTU Detroit Diesel, Model: 12V4000G83, 2561BHP, 16.85MMBTU/hr
S-2 Emergency Standby Diesel Generator Set
MTU Detroit Diesel, Model: 12V4000G83, 2561BHP, 16.85MMBTU/hr
S-3 Emergency Standby Diesel Generator Set
MTU Detroit Diesel, Model: 12V4000G83, 2561BHP, 16.85MMBTU/hr
S-4 Natural Gas Fired Boiler #1
Cleaver-Brook, Model: FLX-1000, 10MMBTU/hr
Equipped with Industrial Combustion NTH 15 ppm Low NOx Burners
S-5 Natural Gas Fired Boiler #2
Cleaver-Brook, Model: FLX-1000, 10MMBTU/hr
Equipped with Industrial Combustion NTH 15 ppm Low NOx Burners
S-6 Natural Gas Fired Boiler #3
Cleaver-Brook, Model: FLX-1000, 10MMBTU/hr
Equipped with Industrial Combustion NTH 15 ppm Low NOx Burners
S-7 Natural Gas Fired Boiler #4
Cleaver-Brook, Model: FLX-1000, 10MMBTU/hr
Equipped with Industrial Combustion NTH 15 ppm Low NOx Burners

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Yu Zhang Liu
Air Quality Engineer Intern
Engineering Division