

## ENGINEERING EVALUATION REPORT

<b>Plant Name:</b>	<b>Sutter Medical Center Castro Valley</b>
<b>Application Number:</b>	<b>24360</b>
<b>Plant Number:</b>	<b>3711</b>

### BACKGROUND

The applicant, Sutter Medical Center Castro Valley, is in the process of upgrading its physical facilities at its hospital in Castro Valley.

Under this application, the applicant is applying for an Authority to Construct for a new dual-fueled space heat boiler.

The applicant is requesting an Authority to Construct for the following equipment:

#### **S-18 SPACE HEAT BOILER, CLEAVER BROOKS MODEL FLX-700, 7.0 MM BTU/HR**

### CRITERIA POLLUTANT EMISSION CALCULATIONS

NO<sub>x</sub> and CO emission factors for the new 7.0 MM BTU/hr boiler are from the manufacturer's guaranteed emissions specifications. PM, POC, and NPOC emission factors are from AP 42, Tables 1-4.2 and 1-4.3. SO<sub>2</sub> emission factor is based on the local nominal average sulfur content of 0.33 grains sulfur per 100 standard cubic feet of natural gas. The emission factors used are as follows:

PM	7.45 E-3	lb/MM BTU	
POC	5.39 E-3	lb/MM BTU	
NPOC	3.04 E-3	lb/MM BTU	
NO <sub>x</sub>	1.82 E-2	lb/MM BTU	(based on 15 ppmv limitation)
SO <sub>2</sub>	5.88 E-4	lb/MM BTU	
CO	2.96 E-1	lb/MM BTU	(based on 400 ppmv limitation <sup>1</sup> )

Total facility-wide criteria pollutant emissions for the new source are as follows:

<sup>1</sup> BACT for small boilers is generally 100 ppmv, but a policy decision has been made to accept up to 400 ppmv, as set out in the interim and final CO emissions limitations set out in Regulation 9, Rule 7, when low NO<sub>x</sub> limits are implemented. See "BACT/TBACT Review" below, and Attachment 6.

**TABLE 1 - CRITERIA POLLUTANT EMISSIONS**

		MM BTU/HR	PM LB/MMBTU	POC LB/MMBTU	NPOC LB/MMBTU	NO <sub>x</sub> LB/MMBTU	SO <sub>2</sub> LB/MMBTU	CO LB/MMBTU
S-18	BOILER	7.0	0.007	0.005	0.003	0.018	0.001	0.296
<b>LB/HOUR</b>			<b>0.052</b>	<b>0.038</b>	<b>0.021</b>	<b>0.127</b>	<b>0.007</b>	<b>2.069</b>
<b>LB/DAY</b>			<b>0.179</b>	<b>0.129</b>	<b>0.073</b>	<b>0.437</b>	<b>0.022</b>	<b>7.092</b>
<b>TOTAL LB/YEAR</b>			<b>457</b>	<b>331</b>	<b>186</b>	<b>1,116</b>	<b>57</b>	<b>18,120</b>
<b>TOTAL TONS/YEAR</b>			<b>0.228</b>	<b>0.165</b>	<b>0.093</b>	<b>0.558</b>	<b>0.029</b>	<b>9.060</b>

**OLD SOURCES: EMISSION REDUCTIONS**

The applicant is not planning to shut down any sources in conjunction with this application therefore no contemporaneous emission reductions were calculated.

**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<sub>x</sub> 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<sub>x</sub> 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<sub>10</sub> or SO<sub>2</sub> offsets under Regulation 2-2-303.

**CUMULATIVE EMISSIONS INCREASE**

Changes to the cumulative emissions inventory are as follows:

**TABLE 2 - CUMULATIVE EMISSION INCREASE INVENTORY**

	Current Balance (tons/yr)	Emission Increases (tons/yr)	On-Site Reductions (tons/yr)	Offsets Required (tons/yr)	New Total (tons/yr)
PM	1.110	0.228	0	0	1.338
POC	1.240	0.165	0	0	1.405
NPOC	0.186	0.093	0	0	0.279
NO <sub>x</sub>	6.680	0.558	0	0	7.238
SO <sub>2</sub>	0.145	0.029	0	0	0.174
CO	25.440	9.060	0	0	34.500
<b>TOTAL</b>	<b>1.110</b>	<b>0.228</b>	<b>0</b>	<b>0</b>	<b>1.338</b>

## **TOXIC RISK CALCULATIONS**

The District requires that all similar projects submitted to the District within the past 24 months be considered as a “related project” for the purposes of risk analysis. Sutter Health Eden Medical Center has requested an Authority to Construct for two other boilers within the last 24 months, under Application #21265 (Source S-16 and S-17, AC granted 7/21/10).

Toxic air pollutants are emitted by all of the boilers considered as this “project”, however the toxic pollutant emissions do not exceed either the chronic or acute trigger levels set in Regulation 2, Rule 5 for the pollutants of concern (Attachment 2). Since the toxic emissions do not exceed the toxic trigger levels, no health risk assessment was performed for the project.

## **BACT/TBACT REVIEW**

Under Regulation 2, Rule 2, any new source which results in an increase of 10 lbs/day or more of any criteria pollutant must be evaluated for adherence to BACT and TBACT control technologies. Based on Table 1 above, this boiler does not emit more than 10 lbs/day of any criteria pollutant, therefore BACT is not triggered for the boiler.

## **COMPLIANCE DETERMINATION**

The boiler in this application is covered under ministerial exemption, Chapter 2.1 of the BAAQMD Permit Handbook. CEQA is not triggered for small boilers (less than 100 MM BTU/hour maximum firing rate).

The boiler is governed by and complies with Regulation 9, Rule 7, "Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters." During natural gas firing, the boiler will meet the following emission limits: 15 ppmv of NO<sub>x</sub> and 400 ppmv of CO in exhaust gases corrected to 3% O<sub>2</sub>, dry basis. These boiler emission limits comply with the current Regulation 9-7-307.2.

Regulation 9-7-113 exempts boilers from the limits in 9-7-307 during diesel oil firing that occurs as a result of natural gas curtailment events (no more than 168 hours/year per boiler) or that is necessary to test a boiler for oil-firing readiness (no more than 48 hours/yr per boiler). Regulation 9-7-113 also limits NO<sub>x</sub> emissions during such oil firing events to 150 ppmv at 3% O<sub>2</sub>, dry basis. The boiler will only burn diesel oil for readiness testing or during natural gas curtailment events, will comply with the operating restrictions in 9-7-113, and will meet an emission limit of 150 ppmv of NO<sub>x</sub> at 3% O<sub>2</sub>, dry basis during any time that oil is fired in the boilers. Therefore, the boiler will comply with Regulation 9-7-113.

The boiler is are not required to meet NSPS requirements as set out in 40 CFR Part 60, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, since the rated heat input is less than 10 MM BTU/hour. The boiler will be required to meet reporting and recordkeeping requirements which are identical to the District Requirements.

## **CONDITIONS**

Condition #24549, setting out the operating conditions and recordkeeping requirements for operations at Source S-18 shall be made part of the source’s Authority to Construct/Permit to Operate.

**RECOMMENDATION**

As discussed above, 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 source will be located within 1000 feet of a school, which triggers the public notification requirements of the California Health & Safety Code Section 42301.6, and the District's Regulation 2-1-412. The District will conduct this public notice and consider any comments received before taking final action on this project.

**S-18 SPACE HEAT BOILER, CLEAVER BROOKS MODEL FLX-700, 7.0 MM BTU/HR**

**subject to Condition #24549.**

By \_\_\_\_\_ Date \_\_\_\_\_  
*Catherine Fortney*

1. Sources S-16, S-17, and S-18 shall burn only natural gas except during short test periods of up to 48 hours per year per boiler maximum, and during periods of natural gas curtailment. [Basis: Regulation 9-7-113.1; Cumulative Increase]
2. The total fuel used at Sources S-16, S-17, and S-18 shall not exceed 1,839,600 therms in any successive 12-month period. [Basis: Cumulative Increase]
3. Maximum firing rate shall not exceed 7 MM BTU/hour per boiler (based on HHV of the fuel) when firing natural gas. [Basis: NSPS]
4. NO<sub>x</sub> emissions from any boiler shall not exceed 15 ppmv at 3% oxygen, dry, at any firing rate when firing natural gas. [Basis: Regulation 9, Rule 7-307.2]
5. CO emissions from any boiler shall not exceed 400 ppmv at 3% oxygen, dry, at any firing rate when firing natural gas. [Basis: Regulation 9, Rule 7-307.2]
6. NO<sub>x</sub> emissions from any boiler shall not exceed 150 ppmv at 3% oxygen, dry, at any firing rate when firing backup fuel. [Basis: Regulation 9, Rule 7-113.2]
7. To demonstrate compliance with the above, the permit holder shall install and maintain a non-resettable totalizing fuel meter, unless the permit holder applies for and receives written approval from the District to use an alternative method for measuring the cumulative annual fuel usage. [Basis: Cumulative Increase]
8. Within 90 days of start-up, the applicant shall conduct an initial demonstration of compliance with the above emissions limitations. All source testing shall be done in compliance with the District's Manual of Procedures. The applicant shall obtain approval from the Manager of the District's Source Test Section for the installation of test ports and source test procedures. The source test results shall be submitted to the District's Director of Compliance and

Enforcement no later than 60 days from the date of the source test. [Basis: Regulation 9-7-403]

9. On or before the later of January 1, 2013, the permit holder must initiate periodic emissions testing of each boiler at least once every two years. Such testing may be conducted either by source testing performed in accordance with the District's Manual of Procedures, or by use of a portable analyzer that meets the specifications and testing protocols set out in Regulation 9, Rule 7-606. [Basis: Regulation 9-7-506]

10. The permit holder shall maintain records of the following:
  - a. Records of the Original Manufacture Date and Initial Startup Date for the source;
  - b. Total monthly natural gas usage, and dates and times of such usage for each boiler;
  - c. For each diesel fuel event, records of the reason for the event, the dates, times, hours of operation on diesel fuel, and diesel fuel usage rate;
  - d. For each natural gas curtailment event, documentation from the natural gas supplier verifying that natural gas was unavailable due to a natural gas curtailment, and a record of the date and time that natural gas was restored to the site; and
  - e. The results of any testing required under paragraph 9 above.

Such records shall be retained for at least two years from date of entry and shall be made available to District staff upon request. [Basis: Regulation 9-7-503; Regulation 1-1-441; Cumulative Increase]

## 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)	
1		Standby Diesel Generator <sup>(1)</sup>	890	BHP	22820	7716	12.83	267.00		195.80	0.28	12.39	
2		Standby Diesel Generator <sup>(1)</sup>	890	BHP	22820	7716	12.83	267.00		195.80	0.28	12.39	
3		Standby Diesel Generator <sup>(1)</sup>	603	BHP	22820	7716	8.70	180.90		132.66	0.19	8.39	
4		Hot Water Boiler <sup>(2,3)</sup>	4	MM BTU/hr	10077	24041	261.08	188.94	106.49	1275.65	20.61	2588.92	
5		Hot Water Boiler <sup>(2,3)</sup>	4	MM BTU/hr	10077	24041	261.08	188.94	106.49	1275.65	20.61	1294.46	
7		CoGeneration Unit <sup>(4)</sup>	0.8	MM BTU/hr	21661	7716	65.66	295.48		246.23	1.89	984.92	
8		CoGeneration Unit <sup>(4)</sup>	0.8	MM BTU/hr	21661	7716	65.66	295.48		246.23	1.89	984.92	
9		Standby Diesel Generator <sup>(5)</sup>	398	BHP	22850	22344	5.88	6.05		114.99	0.21	107.97	
TOTAL							LB/YEAR	694	1,690	213	3,683	46	5,994
							TPY	0.35	0.84	0.11	1.84	0.02	3.00
TOTAL FACILITY PTE =								6.16	TPY				
<sup>(1)</sup> Limited to 20 hours per year operation; 0.0015 ppm sulfur fuel <sup>(2)</sup> Excluding diesel back-up fuel usage <sup>(3)</sup> NOx and CO emissions based on condition limits of 30 ppmv and 100 ppmv respectively. Other emissions from AP 42, Table 1.4-2. <sup>(4)</sup> NOx and CO emissions based on manufacturer's specifications. Other emissions from AP 42, Table 3.2-3. <sup>(5)</sup> Limited to 50 hours per year operation; 0.0015 ppm sulfur fuel													

## ATTACHMENT 2 – TOXIC POLLUTANT EMISSIONS

BAAQMD POLLID	Substance	CAS	Mean Emission Factor	Units	S-18 Chronic Emissions (lb/year)	Chronic Trigger (lb/year)	Exceed Chronic Trigger?	S-18 Acute Emissions (lb/hour)	Acute Trigger (lb/hour)	Exceed Acute Trigger?
41	Benzene	71-43-2	2.06E-06	lbs/MMBtu	0.126	3.8	NO	0.00001	2.9	NO
124	Formaldehyde	50-00-0	7.35E-05	lbs/MMBtu	4.507	18.0	NO	0.00051	0.12	NO
293	Toluene	108-88-3	3.33E-06	lbs/MMBtu	0.204	12,000	NO	0.00002	82.0	NO