

## **ENGINEERING EVALUATION REPORT**

<b>Plant Name:</b>	<b>ST ROSE HOSPITAL</b>
<b>Application Number:</b>	<b>22141</b>
<b>Plant Number:</b>	<b>2099</b>

### **BACKGROUND**

The applicant is applying for an Authority to Construct for a new ethylene oxide (ETO) sterilizer. The applicant is requesting an Authority to Construct for the following equipment:

**S-10 ETO Sterilizer, 3M 8XL**

**abated by**

**A-1 ETO Abator, 3M ETO Catalytic Abator, Model 50**

The sterilizer will be abated using the existing A-1, Donaldson ETO Catalytic Oxidizer.

### **CUMULATIVE EMISSION CALCULATIONS**

This is a new sterilizer, proposed to sterilize miscellaneous medical operations devices. The ETO usage factor for the sterilizer is 170 g/run. Total run time is approximately 585 minutes operating on warm cycle (405 minutes sterilization time plus 80 minutes aeration time), so the theoretical maximum number of runs per year for the sterilizer is

$$(60 \text{ mins/hour}) * (24 \text{ hours/day}) * (365 \text{ days/year}) / (585 \text{ mins/run}) = 898 \text{ runs/year}$$

Maximum annual ETO usage for the sterilizer is then

$$(170 \text{ g/run}) * (898 \text{ runs/year}) / 453.6 \text{ g/lb} = 336.7 \text{ lb/year}$$

The emissions are abated by an abatement device with an abatement efficiency of 99.9%, so the total maximum abated ETO emissions are:

$$(336.7 \text{ lb/year}) * (0.001) = 0.34 \text{ lb/year}$$

## **EMISSIONS REDUCTIONS: EXISTING STERILIZER**

Upon startup of the new sterilizer, the applicant will shut down the existing sterilizer, and will be eligible for emission reduction credits for such shutdown. Emission reduction credits for the reduction in ethylene oxide usage are calculated using the procedures set out in Regulation 2-2-605, **Emission Calculation Procedures, Emission Reduction Credits**. This regulation defines the baseline period as the three year period immediately preceding the date that the application is complete. The baseline throughput is the lesser of the actual average throughput during the baseline period, or the average permitting throughput during the baseline period, if permitted by permit condition.

The existing sterilizer does not have a permit condition limiting ethylene oxide throughput, so the actual ethylene oxide usage for the baseline period is the controlling standard for emissions reductions calculations. Using average actual throughput for Source S-3, the contemporaneous on-site emission reductions are as follows:

ACTUAL ETO EMISSIONS AT EXISTING STERILIZER				
Source #	Period Ending 3/1/2010 (lbs/year)	Period Ending 3/1/2009 (lbs/year)	Period Ending 3/1/2008 (lbs/year)	Average (lbs/year)
S-3	0.017	0.015	0.015	0.016

The contemporaneous on-site emission reductions are then as follows:

	Source S-3 (lb/year)	TOTAL (tons/year)
PM	0	0
POC	0.016	7.8 E-6
NOx	0	0
SO2	0	0
CO	0	0

## **TOXIC RISK CONSIDERATIONS**

An ETO emissions level of anything greater than 1.2 lb/year of ETO automatically triggers a health risk assessment according to Regulation 2, Rule 5. At a maximum potential to emit, this application does not exceed an ETO emission level of 1.2 lbs/year and so no health risk assessment is required.

## **BACT/TBACT REVIEW**

Under Regulation 2, Rule 2, any new source which results in an increase of 10 lbs/day or more of criteria pollutants must be evaluated for adherence to BACT/TBACT control technologies. For this source, BACT is not triggered, as the source does not have the potential to emit more than 10

pounds per day of POC or NPOC (Reg 2-2-301.1). TBACT is not required, as the source does not have the capability of exceeding the trigger level for ETO as listed in Table 2-5-1 (Reg 2-5-110).

### **COMPLIANCE DETERMINATION**

The sterilizer is covered under ministerial exemption, Chapter 10.2 of the BAAQMD Permit Handbook. CEQA is not triggered for sterilizers under this provision.

The sterilizer is governed by and will comply with the provisions of **Regulation 2, Rule 5, “New Source Review for Toxic Air Contaminants.”**

The sterilizer is governed by and will comply with the **California Air Resources Board’s “Ethylene Oxide Air Toxic Control Measure (ATCM) for Sterilizers and Aerators”, CCR Title 17, Sections 93108 and 93108.5.**

These is a new source, and an existing sterilizer will be shut down in connection with this application. The facility does not have the potential to emit more than 10 TPY of precursor organic compounds or nitrogen oxides on a pollutant-specific basis, and so is not subject to offsets under Regulation 2-2-302. The facility is not a Major Facility under Regulation 2-2-220, and so is not subject to PM10 or SO2 emission offset requirements under Regulation 2-2-303.

### **CONDITIONS**

Condition #24723, setting out the operating conditions and recordkeeping requirements for operations at Source S-10 shall be made part of the source's authority to construct/permit to operate.

### **RECOMMENDATION**

I recommend that an Authority to Construct be issued for the following sources:

**S-10 ETO Sterilizer, 3M 8XL**

**abated by the existing**

**A-1 ETO Abator, 3M ETO Catalytic Abator, Model 50**

subject to Condition #24723.

By \_\_\_\_\_ Date \_\_\_\_\_  
*Catherine S. Fortney*

1. Permitted approval is for the use of 100% ethylene oxide sterilant gas only. The use of any other sterilant gas is expressly prohibited under the terms of the permit unless prior approval and a Change of Condition is obtained in writing from the Bay Area Air Quality Management District. [Basis: BACT]
2. Total emissions of 100% ethylene oxide sterilant gas from S-10 shall not exceed 1.2 pounds per consecutive twelve month period. [Basis: Cumulative Increase; Regulation 2, Rule 5]
3. Sterilizer emissions shall be controlled by A-1, Donaldson Model 50 Ethylene Oxide Catalytic Oxidizer. [Basis: BACT; Cumulative Increase; Regulation 2, Rule 5]
4. The sterilization cycle shall not be conducted unless ethylene oxide emissions are reduced by at least 99.9% averaged over the entire discharge cycle. At any time when the abatement system is unable to accept emissions from the sterilizer, the flow to the sterilizer shall automatically cease. The catalyst bed shall be replaced as needed to comply with this requirement. [Basis: "Ethylene Oxide ATCM for Sterilizers and Aerators", Section 93109, Title 17, CCR, Subsection (e); BACT]
5. In order to demonstrate compliance with Paragraph 2 above, the permit holder shall maintain a log of sterilant gas purchases and the date and time of each sterilization operation cycle. These records shall be retained on site for two years after the date of purchase or entry, and shall be made available for inspection by District staff upon request. [Basis: Cumulative Increase, Regulation 1, Rule 1-543]
6. In order to demonstrate compliance with these permit conditions, the permit holder shall perform a District approved compliance source test (ARB Test Method 431) on each sterilizer within 60 days of sterilizer startup. The permit holder shall notify the Manager of the District's Source Test Section and the Director of the Permit Services Division in writing at least seven (7) days prior to the test, to provide District staff the option of observing testing. Within 30 days of test completion a comprehensive report of the test results shall be submitted to the Manager of the District's Source Test Section for review and disposition. [Basis: "Ethylene Oxide ATCM for Sterilizers and Aerators", Section 93109, Title 17, CCR, Subsections (g) and (h)]
7. In order to demonstrate compliance with these permit

conditions, the permit holder also shall perform a District approved compliance source test (ARB Test Method 431) on each sterilizer every two years. The permit holder shall notify the Manager of the District's Source Test Section and the Director of the Permit Services Division in writing at least seven (7) days prior to the test, to provide District staff the option of observing testing. Within 30 days of test completion a comprehensive report of the test results shall be submitted to the Manager of the District's Source Test Section for review and disposition. The first source test shall be due to the District on the second anniversary of the date of the Permit to Operate. [Basis: "Ethylene Oxide ATCM for Sterilizers and Aerators", Section 93109, Title 17, CCR, Subsections (g) and (h)]

8. The permit holder shall obtain approval from the District's Technical Services Division for the installation of stack sampling ports, and for all source testing procedures. The permit holder shall notify the Permit Services and Technical Divisions at least two weeks prior to any source test. [Basis: Regulation 1, Rule 1-501]