

217/782-2113

FEDERALLY ENFORCEABLE STATE OPERATING PERMIT

PERMITTEE

Mount Sinai Hospital  
Attn: Joseph Pintoran, Chief Engineer  
1500 South California Avenue  
Chicago, Illinois 60608-1797

Application No.: 91010067 I.D. No.: 031600CDC  
Applicant's Designation: BLRICEGETS Date Received: November 3, 2003  
Subject: Boilers, Engine-Generators and EtO Sterilizers  
Date Issued: Expiration Date:  
Location: Mount Sinai Hospital, 1500 South California Avenue, Chicago, Cook County

This permit is hereby granted to the above-designated Permittee to OPERATE emission source(s) and/or air pollution control equipment consisting of (3) - dual fuel fired boilers (natural gas and distillate fuel oil used for back-up and testing, with maximum firing rate of 35.6 mmBtu/hr, each), (2) - COGEN natural gas internal combustion engines (2,170, total horsepower), (3) - emergency engine-generators (1 - 110 kW, 1 - 250 kW and 1 - 600 kW) and (2) - EtO Sterilizers, pursuant to the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

- 1a. This Federally Enforceable State Operating Permit (FESOP) is issued to limit the emissions of air pollutants from all the emission units combined, as listed in the above paragraph to less than major source thresholds, i.e., less than 100 tons per year of nitrogen oxide (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>), as further described in Attachment A. As a result, the source is excluded from requirements to obtain a Clean Air Act Permit Program (CAAPP) permit.
- b. Prior to issuance, a draft of this permit has undergone a public notice and comment period.
- 2a. Total usage of natural gas for each boiler shall not exceed 350,000 therms/month and 1,800,000 terms/year.
- b. Total monthly and annual operations and emissions from each boiler using natural gas shall not exceed the following limits:

<u>Pollutant</u>	<u>Emission Rate</u> <u>(lb/10<sup>6</sup> scf)</u>	<u>Emissions</u> <u>(Lbs/Month)</u>	<u>(Tons/Year)</u>
NO <sub>x</sub>	100.0	1,500.00	9.00
CO	84.0	1,260.00	7.56
SO <sub>2</sub>	0.6	8.33	0.05
VOM	5.5	83.33	0.50
PM	7.6	113.33	0.68

These emissions reflect AP-42 emission factors for natural gas fired boilers.

- c. Total usage of distillate fuel oil for each boiler shall not exceed 75,000 gallons/month and 75,000 gallons/year.
- d. Total monthly and annual operations and emissions from each boiler using distillate fuel oil shall not exceed the following limits:

<u>Pollutant</u>	<u>Emission Rate</u>	<u>Emissions</u>	
	<u>(lb/1,000 Gallons)</u>	<u>(Lbs/Month)</u>	<u>(Tons/Year)</u>
NO <sub>x</sub>	20.0	125.00	0.75
CO	5.0	31.66	0.19
SO <sub>2</sub>	39.76	248.33	1.49
VOM	0.34	1.66	0.01
PM	2.0	11.66	0.07

These emissions reflect AP-42 emission factors for distillate fuel oil fired boilers.

- 3a. Total fuel usage of distillate fuel oil for the, (2) - two emergency engine-generators (1 - 110 kW, 1 - 250 kW) and (1 - 600 kW), shall not exceed 3,500 gallons/year and 7,500 gallons/year, respectively.
- b. Monthly and annual operations and emissions from (3)-emergency engine-generators, each shall not exceed the following limits:
  - i. Emissions from each of two Emergency Engine Generators (1-110 kW and 1-250 kW):

<u>Pollutant</u>	<u>Emission Rate</u>	<u>Emissions</u>	
	<u>(Lb/mmBtu)</u>	<u>(Lbs/Month)</u>	<u>(Tons/Year)</u>
NO <sub>x</sub>	4.41	180.00	1.08
CO	0.95	38.33	0.23
SO <sub>2</sub>	0.29	11.66	0.07
VOM	0.36	15.00	0.09
PM	0.31	11.66	0.07

These emissions reflect AP-42 emission factors for internal combustion units, and a conversion factor of 140,000 Btu/gallon of distillate oil.

- ii. Emissions from one Emergency Engine Generator (1 - 600 kW):

<u>Pollutant</u>	<u>Emission Rate</u>	<u>Emissions</u>	
	<u>(lb/mmBtu)</u>	<u>(Lbs/Month)</u>	<u>(Tons/Year)</u>
NO <sub>x</sub>	3.20	280.00	1.68
CO	0.85	75.00	0.45
SO <sub>2</sub>	1.01 * 0.28 = 0.2828	25.00	0.15
VOM	0.09	8.33	0.05
PM	0.0697	6.66	0.04

These emissions reflect AP-42 emission factors for internal combustion unit, and a conversion factor of 140,000 Btu/gallons of distillate oil.

- c. Natural gas or distillate fuel oil shall be the only fuels fired in the three boilers.
- d. Distillate fuel oil shall be the only fuels fired in the three emergency generators.
- e. The emergency generators shall operate to provide back-up power when power from the local utility is interrupted. Under this condition operating hours are assumed to be 500 hours per year.
- 4. Compliance with annual limits shall be determined on a monthly basis from a running total of 12 months of data.
- 5. At the above location, the Permittee shall not keep, store or utilize:
  - a. Distillate fuel oil (Grades No. 1 and 2) with a sulfur content greater than the larger of the following two values:
    - i. 0.28 weight percent, or
    - ii. The weight percent given by the formula: Maximum weight percent sulfur =  $(0.000015) \times (\text{Gross heating value of the oil, Btu/lb})$ .
  - b. Organic liquid by-products or waste materials shall not be used in these fuel combustion emission sources without written approval from the Illinois EPA.
- 6. The Illinois EPA shall be allowed to sample all fuels stored at the above location.
- 7. Annual emissions and operation of two - CO internal combustion engine-generators shall not exceed the following limits:

<u>GOKEN IC Engines</u>	<u>Combined Brake Horsepower</u>	<u>Operating Hours (Hours/Year)</u>	<u>Minimum Operating Load</u>
2 COGEN IC Engines	2,170	3,380	85%

<u>Emissions Type</u>	<u>Emission Factor (Lb/HP-Hr)</u>	<u>Emissions (Lb/Hr)</u>	<u>Emissions (Ton/Yr)</u>
Nitrogen Oxides	$4.4 \times 10^{-3}$	9.55	16.14
Carbon Dioxide	$3.7 \times 10^{-3}$	8.12	13.72
Sulfur Dioxide	$5.0 \times 10^{-6}$	0.01	0.02
Volatile Organic Material	$1.1 \times 10^{-3}$	2.39	4.04
Particulate Matter <sub>10</sub>	$8.0 \times 10^{-5}$	0.18	0.30

These limits are based on manufacturer's test results for NO<sub>x</sub>, CO and VOM; AP-42 factors for SO<sub>2</sub> and PM<sub>10</sub>. Compliance with annual limits shall be determined from a running total of 12 months of data.

8. Only natural gas shall be fired in the 2 COGEN IC engines-generators.
9. The emissions of Hazardous Air Pollutants (HAP) as listed in Section 112(b) of the Clean Air Act shall be less than 10 tons/year of any single HAP and 25 tons/year of any combination of such HAPs. As a result of this condition, this permit is issued based on the emissions of all HAPs from this source not triggering the requirements to obtain a Clean Air Act Permit Program Permit (CAAPP), and Section 112(G) of the Clean Air Act.
10. At all times, the Permittee shall to the extent practicable, maintain and operate the above referenced emission sources, in a manner consistent with good air pollution control practice for minimizing emissions.
- 11a. The Permittee shall maintain records of the following items that allow determination of compliance with permit conditions:
  - i. Monthly and annual records of natural gas and distillate fuel oil usage for each emission group as limited in the above conditions (therms/month and therms/year or gallons/month and gallons/year).
  - ii. Record hours of operation for each boiler, for each COGEN IC engine and for each emergency engine-generators operating hours (hours/month and hours/year).
  - iii. Records for each shipment of fuel oil received, the amount, maximum sulfur content, and supplier.
  - iv. The sulfur content of the fuel oil supply to the engines, based on the weighted average of material in the storage tank, or the sulfur content of the supply shall be assumed to be the highest sulfur content in any shipment in the tank.
  - v. Total monthly and aggregate annual emissions of CO, NO<sub>x</sub>, PM, SO<sub>2</sub>, and VOM from each emission unit with supporting calculations (tons/month and tons/year).
12. Monthly and annual emissions and operation of the two EtO Sterilizers shall not exceed the following limits:

Material Used	Usage (Lb/Mo)	E M I S S I O N S			
		Volatile Organic (Lb/Mo)	Material (Ton/Yr)	Hazardous Air (Lb/Mo)	Pollutants (Ton/Yr)
Ethylene Oxide	143	143	0.86	143	0.86

These limits are based upon the maximum material usage and maximum VOM and Hazardous Air Pollutant (HAP) content of 100% by weight. Conversion factor used 2000 lb/ton.

13. The Permittee shall maintain records of the following items:
  - a. Ethylene Oxide usage (lbs/month and tons/year).

- b. Total emissions of VOM and HAPs (lbs/month and tons/year).
14. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Illinois EPA and USEPA upon request. Any records retained in an electronic format (e.g., computer) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA request for records during the course of a source inspection.
15. If there is an exceedance of the requirements of this permit as determined by the records required by this permit, the Permittee shall submit a report to the Illinois EPA's Compliance Section in Springfield, Illinois within 30 days after the exceedance. The report shall include the emissions released in accordance with the recordkeeping requirements, a copy of the relevant records, a description of the exceedances or violation, and efforts to reduce emissions and future occurrences.
16. Two (2) copies of required reports and notifications concerning equipment operation or repairs, performance testing or a continuous monitoring system shall be sent to:

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
Compliance Section (#40)  
P.O. Box 19276  
Springfield, Illinois 62794-9276  
Tel: 217/782-5811 Fax: 217/782-6348

and one copy shall be sent to:

Illinois Environmental Protection Agency  
Division of Air Pollution Control - Regional Office  
9511 West Harrison  
Des Plaines, Illinois 60016  
Tel: 847/294-4000 Fax: 847/294-4018

If you have any questions concerning this permit, please call Your Benofamil at 217/782-2113.

Donald E. Sutton, P.E.  
Manager, Permit Section  
Division of Air Pollution Control

DES:YB:psj

cc: Region 1  
IEPA, FOS  
Lotus Notes

Facility: Mount Sinai Hospital  
 I.D. No.: 031600CDC  
 Application No.: 91010067

Attachment A

This attachment provides a summary of the maximum emission from the (3) - boiler units, (3) - emergency generators, and (2) - COGEN IC engines operating in compliance with the requirements of this Federally Enforceable State Operating Permit. In preparing this summary, the Illinois EPA used the annual operating scenario which results in maximum emissions from this source. This is a maximum usage of natural gas and distillate fuel oil consumed by the (3) - boilers, (3) - generators, and (2) - CO internal combustion engine-generators at this facility. The resulting maximum emissions are below the levels, e.g., 100 tons per year of NO<sub>x</sub>, at which this source would be considered a major source for purpose of the Clean Air Act Permit Program. Actual emissions from this source will be less than predicted in this summary to the extent that less material is handled, and control measures are more effective than required in this permit.

<u>Emission Units</u>	<u>Total Emissions (Tons/Year)</u>				
	<u>NO<sub>x</sub></u>	<u>CO</u>	<u>SO<sub>2</sub></u>	<u>VOM</u>	<u>PM</u>
3 Boilers (Natural Gas)	27.00	22.68	0.16	1.50	2.05
3 Boilers (Distillate Fuel Oil)	2.25	0.56	4.47	0.04	0.22
3 Emergency Generators	3.84	0.91	0.29	0.23	0.19
2 Co Engine Generators	16.14	13.72	0.02	4.04	0.30
2 Eto Sterilizers	-----	-----	----	<u>0.86</u>	----
Totals:	<u>49.23</u>	<u>37.87</u>	<u>4.94</u>	<u>6.67</u>	<u>2.76</u>

DES:YB:psj

## PROJECT SUMMARY

### I. INTRODUCTION

The Mount Sinai Hospital has submitted an application for renewal of their federally enforceable state operating permit consisting of support equipment for their medical center, including three steam boilers, five electric engines, emergency engine-generators, and two EtO sterilizers. This permit prevents the site from being classified as a major source of emissions under the Clean Air Act. Therefore, the Mount Sinai Hospital will not have to obtain a federal permit under the Clean Air Act Permit Program. The renewal permit would contain limitations and accompanying recordkeeping and reporting requirements to assure that the site is operated as a non-major source.

### II. SOURCE DESCRIPTION

These boilers, five generators and two EtO sterilizers are used by the Mount Sinai Hospital to generate steam and electrical power for their own usage. Each generator consists of a reciprocating engine which drives an electric generator by means of a rotating shaft. The reciprocating engines are driven by the combustion of distillate diesel fuel oil or natural gas.

### III. EMISSIONS

Air pollutants are generated when these boilers and reciprocating engines are in operation. These emissions occur from the combustion of diesel fuel or natural gas and are exhausted through a pipe to a vent located on the roof.

The primary air pollutants from these boilers and reciprocating engines are nitrogen oxide (NO<sub>x</sub>), carbon monoxide (CO), volatile organic material (VOM), sulfur dioxide (SO<sub>2</sub>), and particulate matter (PM).

NO<sub>x</sub> is formed thermally by the combination of oxygen and nitrogen in the air at the temperature at which the fuel is burned. CO, VOM, and PM are formed from incomplete combustion of the fuel. Emissions of SO<sub>2</sub> are found in varying amounts from the combustion of diesel fuel, depending on the sulfur content of the fuel.

The proposed permit includes limitations that restrict the potential annual emissions of NO<sub>x</sub>, CO, VOM, and SO<sub>2</sub> to levels below major source thresholds.

### IV. APPLICABLE EMISSION STANDARDS

All emission sources in Illinois must comply with the Illinois Pollution Control Board's emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The Board has standards for sources of particulate matter, volatile organic material, and sulfur dioxide for reciprocating engines. This site readily complies with those Board standards.

V. PROPOSED PERMIT

The conditions of the proposed permit contain limitations and requirements to assure that this site will be operated as a non-major source. The permit establishes limitations on the amount of fuel which may be burned.

The permit conditions also establish appropriate compliance procedures, including record keeping requirements and reporting requirements. The Mount Sinai Hospital must carry out these procedures on a continual basis to demonstrate that the boilers and generators are operating within the limitations established by the permit.

VI. REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that these boilers and generators meet all applicable state and federal air pollution control requirements, subject to the conditions of the draft permit. The Illinois EPA is therefore proposing to issue a permit with federally enforceable limits for the above referenced equipment to the Mount Sinai Hospital.

Comments are requested on this proposed action by the Illinois EPA and the proposed conditions on the draft permit. If there is significant public interest in this matter, the Illinois EPA may hold a public hearing in accordance with 35 Ill. Adm. Code Part 166.

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