

**SMSJ TUCSON HOLDINGS, LLC - ST. MARY'S HOSPITAL**

**AIR QUALITY OPERATING PERMIT 1631**

**TECHNICAL SUPPORT DOCUMENT (TSD)**

**I. GENERAL COMMENTS:**

**A. Company Information**

1. Source Name: Carondelet St. Mary's Hospital
2. Source Address: 1601 W. St. Mary's Road, Tucson, AZ 85745

**B. Background**

The facility currently operates under a Class II air quality permit. It is considered a true minor source of criteria pollutants and an area source of HAPs.

This TSD was updated for the renewal of the permit. The renewal application was received on February 21, 2007. The renewal includes information from the minor revision dated April 18<sup>th</sup>, 2011, September 1, 2011, and January 31, 2013.

**C. Attainment Classification**

The facility is located in an area that is in attainment for all pollutants.

**II. SOURCE DESCRIPTION**

**A. Process Description**

The facility provides a variety of medical services to the community. The facility operates two boilers and four emergency generators in support of its operations.

The boilers have been manufactured to fire either natural gas or distillate fuel oil. The primary fuel for the boilers is natural gas and distillate fuel oil can be used in an emergency or if it becomes financially practicable to use. The emergency generators are fired exclusively with diesel fuel.

**B. Operating Capacity and Schedule**

The operating schedule at the facility is not limited and the facility and equipment is permitted for operation 7/days/week, 24 hours a day, 365 days a year

**C. Air Pollution Control Equipment**

The boilers have no pollution control equipment other than possible oxygen trim systems that optimize the fuel to air ratio for the fuels fired in the boilers.

### III. REGULATORY HISTORY

The facility is currently in compliance with all Title 17 Pima County Code requirements.

### IV. EMISSIONS ESTIMATES

Emission estimates for the CSMH were derived using emission factors from AP-42 tables. AP-42 tables 3.3-1 thru 3 and 3.4-1 thru 4 (Diesel Industrial Engines and Large Stationary Diesel Engines) were used for emergency generator emission factors. For the boilers the highest emission factors for diesel or natural gas were used from AP-42 tables 1.3-1 and 2, the controlled SO<sub>x</sub> emission factor was adjusted per AP-42 Table 1.3-1 to burning distillate fuel oils containing no greater than 0.5% by weight Sulfur.

The emergency generators are fired exclusively with diesel fuel. The emergency generator's PTE is assumed to be inherently controlled per EPA guidelines to operation for no more than 500 hours. The source is a true minor source of criteria pollutants. The emergency generators are restricted by the permit to operate no more than 100 hours to avoid triggering additional federal requirements. True emergency operation is not limited. Restricting the allowable fuels in the boilers and run hours for maintenance and readiness testing to less than 100 hours, results in the boilers having no limitations when firing fuel oil.

The following table outlines the facilities controlled and uncontrolled potential to emit.

The PTE has been calculated for the boilers using the highest emission factors for diesel or natural gas and the limited operation of the emergency generators to 100 hours in accordance with the federal requirements.

Potential to Emit (Tons per Year) Diesel Fired Generators and Natural Gas or Distillate Fuel Oil Fired Boilers						
	NO <sub>x</sub>	CO	VOC	SO <sub>x</sub>	PM <sub>10</sub>	HAPs
Uncontrolled <sup>1</sup>	53.81	17.38	2.19	106.05	3.01	0.21
Controlled <sup>2</sup>	19.07	10.46	0.89	54.83	1.69	0.20

<sup>1</sup> Generators operating 500 hrs/yr and boilers operating 8760 hrs/yr and firing fuel with 0.9% weight Sulfur max.

<sup>2</sup> Generators limited to 100 hrs/yr and boilers operating 8760hrs/yr while firing fuel oil with 0.5% weight Sulfur max.

### V. APPLICABLE REQUIREMENTS

#### 40 CFR, Part 60 Standards of Performance for New Stationary Sources

- Subpart A General Provisions
- Subpart Dc NSPS for Small Industrial-Commercial-Institutional Steam Generating Units
- Subpart IIII NSPS for Stationary Compression Ignition Internal Combustion Engines
- Appendix A Test Methods

## **Pima County Code Title 17, Chapter 17.12 – Permits and Permit Revisions**

### **Article I – General Provisions**

- 17.12.010 Statutory Authority
- 17.12.020 Planning, Constructing, or Operating Without a Permit
- 17.12.040 Reporting requirements
- 17.12.045 Test methods and procedures
- 17.12.050 Performance tests
- 17.12.080 Permit Display or Posting

### **Article II – Individual Source Permits**

- 17.12.165 Permit application processing procedures for Class II and Class III permits
- 17.12.185 Permit contents for Class II and Class III permits
- 17.12.190 Permits containing synthetic emission limitations and standards
- 17.12.235 Facility Changes that require a permit revision
- 17.12.240 Procedures for certain changes that do not require a permit revision Class II or Class III
- 17.12.255 Minor Permit Revision
- 17.12.260 Significant Permit Revision
- 17.12.270 Permit Reopenings – Revocation and reissuance – Termination
- 17.12.350 Material permit condition

### **Article VI – Individual Source Permits**

- 17.12.520 Fees related to Class II and Class III permits

## **Pima County Code Title 17, Chapter 17.16 – Emission Limiting Standards**

### **Article I – General Provisions**

- 17.16.010 Local rules and standards; Applicability of more than one standard
- 17.16.020 Noncompliance with applicable standards
- 17.16.030 Odor limiting standards

### **Article II – Visible Emission Standards**

- 17.16.040 Standards and applicability (includes NESHAP)
- 17.16.050 Visibility limiting standard

### **Article IV – New and Existing Stationary Source Performance Standards**

- 17.16.130 Applicability
- 17.16.165 Standards of performance for fossil-fuel fired industrial commercial equipment
- 17.16.340 Standards of performance for stationary rotating machinery
- 17.16.430 Standards of performance for unclassified sources

## **Pima County Code Title 17, Chapter 17.20 – Emissions Source Testing and Monitoring**

- 17.20.010 Source sampling, monitoring and testing
- 17.20.040 Concealment of emissions

## **Pima County Code Title 17, Chapter 17.24:**

- 17.24.020 Recordkeeping for compliance determination

## VI. REQUIREMENTS SPECIFICALLY IDENTIFIED AS NON-APPLICABLE

40 CFR Part 63 NESHAP Subpart JJJJJ has been identified as non-applicable since the boilers will be operated as gas-fired boilers. Should the boilers switch to fuel oil use and become subject to Subpart JJJJJ in the oil firing subcategory as defined in 40 CFR 63.11237 a significant permit revision will be required and compliance with Subpart JJJJJ will be required within 180 days of the effective date of the fuel switch.

## VII. PERMIT CHANGES and APPLICABILITY DETERMINATIONS

### A. Permit and Permit Summary

The Specific Conditions have been organized into permit sections specific to the equipment and source categories. Many of the conditions in the previous permit no longer apply and NSPS requirements apply to the boilers and generators.

### B. General Applicability (Section 1):

This Section of the permit provides a reference for the applicability of the affected sources and PCC and federal rules that apply to the facility and operations, and to help organize the permit sections. Specific applicability conditions for the permitted facility sources are provided in Section 6.

### C. Facility-Wide Operations (Section 2):

This Section incorporates the facility wide provisions applicable to all sources at the facility and is used to streamline provisions applicable to the specific sources and operations in other sections of the permit to include the following: Operating Restrictions, general control standards, materials handling standards, odor limiting standards, opacity standards, visibility limiting standards, and asbestos requirements for demolition and renovation activities. This Section also incorporates the facility-wide provisions for monitoring, recordkeeping, reporting, facility changes, and testing.

### D. Fossil Fuel Fired Industrial and Commercial Equipment (Boilers and Heaters) (Section 3):

This Section incorporates applicable PCC requirements and fuel restrictions for boilers, heaters, and fuel fired equipment to avoid certain requirements in PCC 17.16.165, 40 CFR Part 60, NSPS Subpart Dc and 40 CFR Part 63, NESHAP Subpart JJJJJ. The specific applicability provisions for the boilers and heaters are included in Section 6 and indicated in the equipment list.

The listed boilers and heaters in the equipment list are limited to firing natural gas; or fuel oil. The specific definition for natural gas is taken from the NESHAP standard and is a broad definition that also includes LPG or Propane for use in temporary boilers or as an alternate fuel if required.

The fuel oils fired in the boilers are limited to distillate fuels No.1 and No.2 which are limited by ASTM fuel standards to contain no more than 0.5% weight Sulfur (5000 ppm<sub>mass</sub>). [ref. 40 CFR 63.11237, distillate fuel oil definition & ASTM D 396]. The permit restricts the boilers to firing this fuel to avoid triggering certain additional federal requirements.

The permit also restricts operation of dual fired boilers to the use of fuel oil only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel to avoid triggering tune up requirements for boilers that are considered oil fired boilers subject to 40 CFR Part 63, Subpart JJJJJ.

#### **E. Non-NSPS / Non-NESHAP Generators (Section 4):**

This Section contains requirements for generators that are not subject to or exempt from NSPS standards in 40 CFR Part 60, Subpart IIII or NESHAP standards in 40 CFR Part 63, Subaprt ZZZZ. The emergency generators are exempt from NESHAP, Subpart ZZZZ as institutional emergency generators. Should the generators operate or become contractually obligated for more than 15 hours a year for the purposes of emergency demand response and to stabilize voltage deviations of 5 percent or greater below standard voltage, or should the above generators operate for non-emergency purposes to supply power as part of financial arrangement with another entity, the generators will be subject to NESHAP Subpart ZZZZ and the Permittee is required to submit a significant revision.

#### **F. NSPS for Stationary Internal Combustion Engines 'ICE' (Section 5):**

This Section incorporates specific federal emission limits and requirements for installation and operation of compression ignition engines subject to 40 CFR Part 60, NSPS Subpart IIII. The federal requirements limit stationary emergency engines to less than 100 hours per calendar year for maintenance and testing and emergency demand response and less than 50 of the 100 hours per year for non-emergency situations if they qualify per 40 CFR 60.4211(f)(3)(i).

#### **G. Specific Applicability Provisions (Section 6):**

This Section of the permit provides specific conditions that relate the applicability of facility sources, source categories, affected facilities, equipment, emission sources, installations, activities and operations at the facility to applicable standards.

The facility is required to submit a significant revision if the facility desires to fire fuels other than the allowable fuels in Section 3 of the permit.

### **VIII. Periodic Monitoring**

This is a Class II/III permit and, as such, does not include the mandatory submittal of a semiannual summary report of required monitoring or an annual compliance certification to the Control Officer. The permit requires the facility to maintain the required periodic monitoring records on site and their submittal as requested by the Control Officer in order to demonstrate compliance.

### **IX. Control Technology Determination**

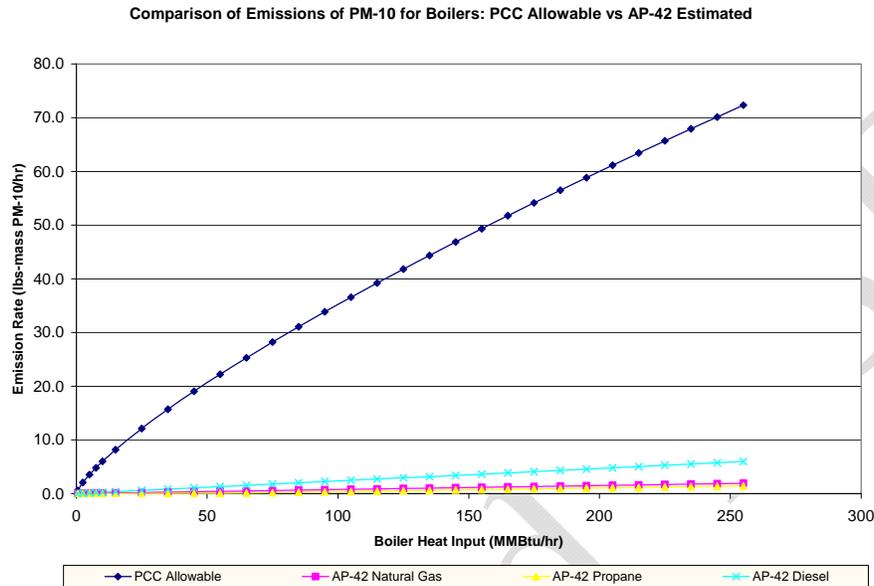
No control technologies needed to be determined; the source is not subject to RACT, BACT or LAER.

### **X. Exclusion of PCC Particulate Matter Discharge Rate Standards**

The applicable PCC rules for the maximum particulate discharge rates are not normally included for Class II and III area source permits as explained below.

- For particulate matter sources, the calculated maximum particulate matter discharge rate, as provided in Title 17, yields maximum rates that far exceed the emissions expected from most typical area sources. For example a 200 ton/hour process source, which is typical for an average construction aggregate screening operation, would be limited to a maximum particulate matter discharge rate of 40.4 lbs/hour or 177 tons/year. This limit far exceeds estimated emissions from typical sources using EPA AP-42 emission factors and the source is far more likely to exceed opacity and visibility limiting standards well before reaching this limit.

- With regard to fuel burning equipment, PCC 17.16.165.C limits the emissions of particulate matter from commercial and industrial fossil-fuel fired equipment (including but not limited to boilers). This limit is not normally included in permits because allowable emissions are consistently over an entire order of magnitude higher than EPA AP-42 estimated potential emissions. The chart below, illustrates the point.



Comparative Chart of Allowable Particulate Emissions Under Pima County Code, Title 17, and Estimated Potential Emissions based on EPA AP-42 Estimates for External Combustion Sources. Allowable emissions are consistently over ten times estimated potential emissions. Therefore, it is not necessary to include the standard in the permit explicitly, but by reference in Attachment 1.

## **XI. Exclusion of PCC Sulfur Dioxide Emission Standards**

Compliance with the fuel sulfur limitation requirements in the permit shall ensure compliance with the Sulfur Dioxide Standards of PCC 17.16.165.E and 17.16.340.F; which limit the emission of SO<sub>2</sub> to 1.0 pound per million BTU of heat input when burning low sulfur fuel. The definition of low sulfur fuel (PCC 17.04.340.A. “Low Sulfur Fuel”) is fuel oil containing less than 0.9 percent sulfur by weight. “High Sulfur Fuel” is defined as fuel oil containing 0.9% wt. or more Sulfur. In accordance with EPA AP-42 Appendix A, page A-5, the heating value of diesel fuel is estimated at 137,000 BTU per gallon. Thus, 1 million BTU of heat input is equivalent to 7.3 gallons of diesel. At 7.05 lbs per gallon, 51.47 lbs of diesel will produce 1 million BTU. At 0.9% 51.47 lbs of diesel contains 0.46 lbs of sulfur. Combined with Oxygen to form SO<sub>2</sub>, and assuming 100% of the sulfur in the fuel forms SO<sub>2</sub>, this would yield 0.92 lb SO<sub>2</sub> per 1MMBtu. Thus, low sulfur fuel oil will produce 0.92 lbs of SO<sub>2</sub> per million BTU of heat input. This is roughly 8% less than the prescribed 1.0 pound SO<sub>2</sub> per million BTU limit.

Natural gas, gasoline, No. 1 and 2 distillate fuel oils, 1-D and 2-D Diesel, and jet fuels delivered to Pima County consistently show sulfur levels below the 0.5% wt. sulfur level as shown in fuel supplier certifications which verify the sulfur content of the fuel fired. The equipment specific fuel sulfur restrictions in the permit and the prohibition to use high sulfur oil in other fuel fired equipment at the facility allow for the omission of PCC 17.16.165.E and PCC 17.16.340.F. These rules are incorporated by reference in Attachment 1 of the permit.