SMSJ Tcuson Holdings, LLC. - Carondelet St. Joseph's Hospital

Air Quality Operating Permit 1629

Technical Support Document (TSD)

I. GENERAL COMMENTS:

A. Company Information

1. Source Name: SMSJ Tucson Holdings, LLC - St. Joseph's Hospital
1. Source Address: 350 N Wilmot Road, Tucson AZ 85711

B. Background

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

This TSD was updated for the renewal of the permit. The renewal application was received on June 28, 2010 and was updated on June 29, 2015.

C. Attainment Classification

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

II. SOURCE DESCRIPTION

A. Process Description

The source provides a variety of medical services to the community. The facility operates three emergency generators, three boilers, two heaters, and a fuel storage tank 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 the use of distillate fuel oil can be used in an emergency. 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

B. Air Pollution Control Equipment

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

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III. REGULATORY HISTORY

The source is currently in compliance with all Pima County Code requirements.

IV. EMISSIONS ESTIMATES

Emission estimates for the facility 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 SO_x 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 of operation to avoid triggering other federally applicable requirements. True emergency operation is not limited. Restricting the allowable fuels fired in the boilers and the maintenance and readiness testing run hours of the emergency generators, results in the boilers having no limitations when firing fuel oil.

The following tables outline the sources uncontrolled and controlled 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. There is no hour limit on the emergency generators during true emergencies.

Potential to Emit (Tons per Year) Diesel Fired Generators and Natural Gas or Distillate Fuel Oil Fired Boilers						
	NOx	CO	VOC	SOx	PM_{10}	HAPs
Uncontrolled*	51.36	19.49	1.86	154.01	9.84	0.31
Controlled**	28.64	14.31	1.05	82.37	3.63	0.30

* Generators operating 500 hrs/yr and boilers operating 8760 hrs/yr and firing fuel with 0.9% weight Sulfur.

** Generators limited to 100 hrs/yr and boilers limited to 8760 hrs/yr and restricted to use 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

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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
17.12.235 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

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VI. REQUIERMENTS SPECIFICALLY IDENTIFIED AS NON-APPLICABLE

40 CFR Part 63 NESHAP Subpart JJJJJJ 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 JJJJJJ in the oil firing subcategory as defined in 40 CFR 63.11237, a significant permit revision will be required and compliance with Subpart JJJJJJ 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 in the previous permit no longer apply.

B. Applicability (Section 1):

This Section of the permit provides a reference for the applicability of the affected sources and to help organize the permit sections. Specific Conditions relating to the applicability of permitted facility sources are provided in Section 5.

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 to include the following: Operating Restrictions, General control standards, Materials handling standards, Odor limiting standards, Opacity limit and the Visibility Limiting Standards. This Section also incorporates the facility-wide provisions for recordkeeping, reporting requirements, facility changes, and testing requirements.

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 JJJJJJ for certain classes of boilers. The specific applicability provisions for the boilers and heaters are included in Section 5 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 are restricted to <u>distillate</u> fuels No.1 and No.2 which are limited by ASTM fuel standards to contain no more than 0.5% weight Sulfur (5000 ppm_{mass}) [ref. 40 CFR 63.11237, distillate fuel oil definition & ASTM D396]. The permit restricts the firing these fuels to avoid triggering certain additional federal requirements that require particulate matter testing for certain boilers that commenced construction after February 28, 2005 and fire fuel oil with greater than 0.5 % weight Sulfur.

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 additional tune up requirements for boilers that are considered oil fired boilers subject to 40 CFR Part 63, Subpart JJJJJJ.

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E. NSPS for Stationary Internal Combustion Engines 'ICE' (Section 4):

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 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). There are no limitations for the use of the emergency generators for true emergencies.

F. Specific Applicability Provisions (Section 5):

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.

Applicable steam generating units (boilers) that comply with Section 3 of the permit shall be considered to be compliant with 30 CFR 60, Subpart Dc and PCC 17.16.165. The facility is required to submit a significant revision if the facility desires to fire fuels other than those allowed 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.

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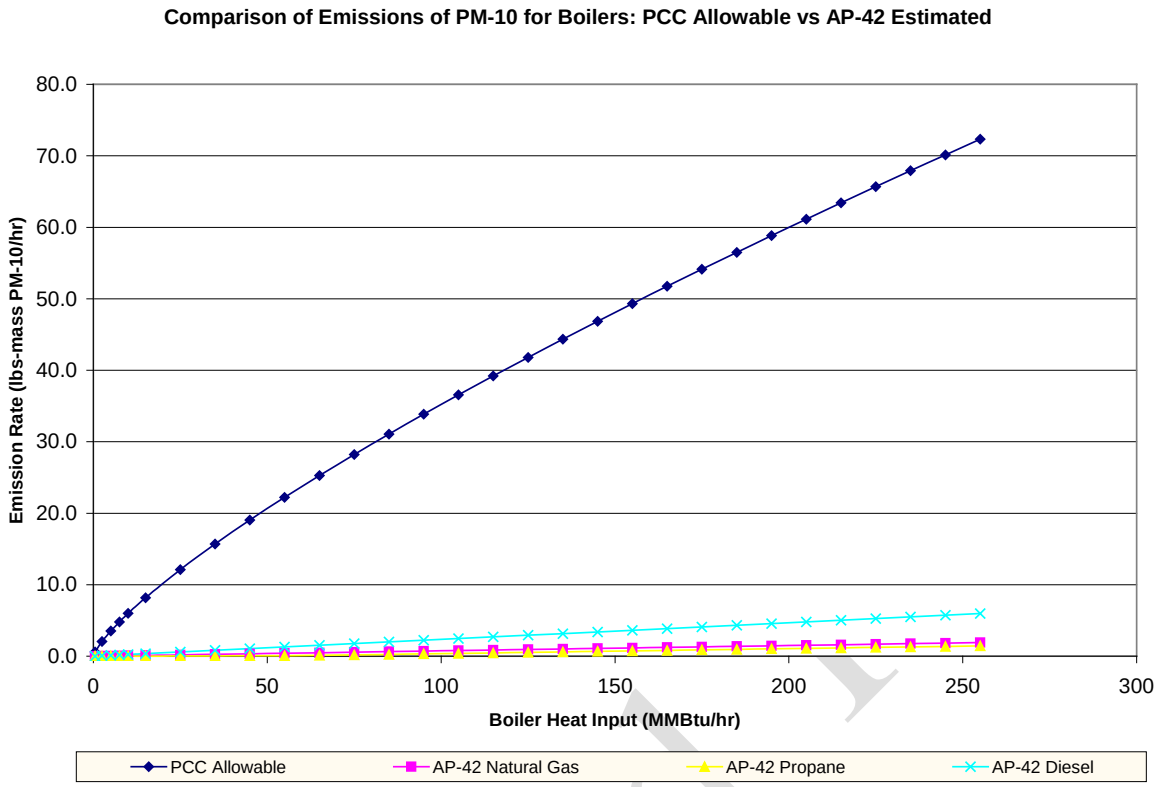

Comparative Chart of Allowable Particulate Emissions Under Pima County Code, Title 17, and Estimated Potential Emissions based on EPA AP-42 Estimates for External Combustion Sources. Allowable emissions are consistently over ten times estimated potential emissions. Therefore, it is not necessary to include 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_2 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 SO2, and assuming 100% of the sulfur in the fuel forms SO2, this would yield 0.92 lb SO2 per 1MMBtu. Thus, low sulfur fuel oil will produce 0.92 lbs of SO2 per million BTU of heat input. This is roughly 8% less than the prescribed 1.0 pound SO2 per million BTU limit.

Natural gas, gasoline, and 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.

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