

**ALLEGHENY COUNTY HEALTH DEPARTMENT  
AIR QUALITY PROGRAM**

November 23, 2015

**SUBJECT:** Allegheny County Jail  
950 Second Avenue  
Pittsburgh, PA 15219  
Allegheny County

**Operating Permit No. 0883**

**TO:** Sandra L. Etzel  
Chief Engineer

**FROM:** Melissa Jativa  
Air Quality Engineer

**FACILITY DESCRIPTION:**

The Allegheny County Jail consists of one (1) 1750 kW diesel generator. The facility is a minor source of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), particulate matter, particulate matter < 10 microns in diameter (PM-10), sulfur oxides (SO<sub>x</sub>), volatile organic Compounds (VOCs) and hazardous air pollutants (HAPs) as defined in section 2101.20 of Article XXI.

**PERMIT APPLICATION COMPONENTS:**

1. Installation/Operating Permit application #0883-I001, dated May 6, 2014

**EMISSION SOURCES:**

I.D.	SOURCE DESCRIPTION	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
B001	Emergency Generator #1 Caterpillar SR4-3516	none	1750 kW	Diesel Fuel	S001

**METHOD OF DEMONSTRATING COMPLIANCE:**

Compliance with the emission standards set in this permit will be demonstrated by maintaining records of generator operation and fuel use as well as supplier certification of sulfur content.

See Operating Permit No. 0883 for the specific conditions for determining compliance with the applicable requirements.

**EMISSION CALCULATIONS**

Generator Rating: 1750 kW  
 Fuel Oil Rating: 140,000 Btu/gal  
 No. of Generators: 1 (one)  
 Fuel Oil Sulfur Limit: 0.0015%  
 Operation: 500 hrs/yr

All Emissions except for CO are based on AP-42, Chapter 3.4. Because particulate matter and sulfur oxide emissions based on AP-42 factors are less than the limits in Article XXI, §2104.02(a)(1)(B) and §2104.03(a)(2)(A), the Article XXI limits have been streamlined into the limits. All PM is assumed to be PM<sub>10</sub>; all PM<sub>10</sub> is assumed to be PM<sub>2.5</sub>.

Article XXI:  $0.28 \text{ lb}_{\text{PM}}/\text{MMBtu} \times 5.97 \text{ MMBtu/hr} = 1.67 \text{ lb}_{\text{PM}}/\text{hr}$   
 $1.0 \text{ lb}_{\text{SO}_x}/\text{MMBtu} \times 5.97 \text{ MMBtu/hr} = 5.97 \text{ lb}_{\text{SO}_x}/\text{hr}$

CO MW: 28 lb/lb·mol  
 F<sub>d</sub>-Factor: 9,190 scf<sub>eg</sub>/MMBtu  
 Density: 385 scf/lb·mol  
 Oxygen: 15%

CO Emissions:

$(23 \text{ ppm}_v \div 10^6) \times 9,190 \text{ scf/MMBtu} \times 5.97 \text{ MMBtu/hr} \div 385 \text{ scf/lb}\cdot\text{mol} \times 28 \text{ lb/lb}\cdot\text{mol} \times [20.9/(20.9 - 15)] =$   
 $= \mathbf{0.325 \text{ lb/hr CO}}$

**B001 Emission Limits**

Pollutant	Emissions Factor		Short-Term Emissions (lb/hr)	Long-Term Emissions (tpy)
PM	0.0007 lb/hp-hr	AP-42, Table 3.4-1	1.64	0.41
PM <sub>10</sub>	0.0007 lb/hp-hr	AP-42, Table 3.4-1	1.64	0.41
PM <sub>2.5</sub>	0.0007 lb/hp-hr	AP-42, Table 3.4-1	1.64	0.41
NO <sub>x</sub>	0.024 lb/hp-hr	AP-42, Table 3.4-1	56.30	14.08
CO	23 ppm <sub>v</sub> @ 15% O <sub>2</sub>	§60.6603(a) Table 2d	0.33	0.08
SO <sub>x</sub>	0.00809*S%	AP-42, Table 3.4-1	0.03	0.01
VOC	0.000705 lb/hp-hr	AP-42, Table 3.4-1	1.65	0.41

GHG Mass and CO<sub>2</sub>e Emissions:

Calculations of greenhouse gases (GHG) and CO<sub>2</sub>-equivalent (CO<sub>2</sub>e) emissions are based on the methodology found in 40 CFR Part 98, Subpart C, §98.33(a)(1), and factors found in Table C-1 and Table C-2 of that subpart. According to 40 CFR, §98.30, GHG emissions from emergency generators are not included in the mandatory greenhouse gas reporting rule, so estimated emissions are included here for informational purposes only.

Total rated heat input capacity of the generator = 5.97 MMBtu/hr × 500 hr/yr = 2,985 MMBtu/yr

CO<sub>2</sub>: 2,985 MMBtu/yr × 73.96 kg/MMBtu ÷ 1,000 kg/metric ton = 220.77 metric tons/year

NO<sub>2</sub>: 2,985 MMBtu/yr × 6×10<sup>-4</sup> kg/MMBtu ÷ 1,000 kg/metric ton = 0.002 metric tons/year

CH<sub>4</sub>: 2,985 MMBtu/yr × 3×10<sup>-3</sup> kg/MMBtu ÷ 1,000 kg/metric ton = 0.009 metric tons/year

$$\text{CO}_2\text{e} = (220.77 \times 1) + (0.002 \times 310) + (0.009 \times 21) = \mathbf{221.58 \text{ metric tons/year of CO}_2\text{e}}$$
$$= \mathbf{244.25 \text{ tpy of CO}_2\text{e}}$$

### **REGULATORY APPLICABILITY:**

1. **Article XXI Requirements for Issuance:**

The requirements of Article XXI, Parts B and C for the issuance of minor source operating permits have been met for this facility. Article XXI, Part D, Part E & Part H will have the necessary sections addressed individually.

2. **Testing Requirements:**

No testing is required for this permit at this time. However, the Department reserves the right to require testing in the future to assure compliance with the terms and conditions of Operating Permit No. 0883.

3. **New Source Performance Standards (NSPS):**

The generator is not subject to 40 CFR Part 60, Subpart III – *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*. The generator commenced construction before July 11, 2005, before the applicability date of the NSPS and was manufactured before April 1, 2006.

4. **NESHAP and MACT Standards:**

The generator is subject to 40 CFR Part 63, Subpart ZZZZ – *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*. It is considered an existing stationary engine >500hp located at an area source of HAP.

5. **Risk Management Plan; CAA Section 112(r):**

The facility is not required to have a risk management plan at this time because none of the regulated chemicals exceed the thresholds in the regulation.

6. **Greenhouse Gases (40 CFR Part 98):**

The facility is a minor source of greenhouse gas emissions based on an estimated potential emissions of 244 tpy of CO<sub>2</sub>e, which is less than the major source threshold of 100,000 tpy of CO<sub>2</sub>e. There are presently no Title V applicable requirements for greenhouse gases. Should the facility exceed 25,000 metric tons of CO<sub>2</sub>e in any 12-month period, the facility would be required to submit reports in accordance with 40 CFR Part 98.

7. **Emissions Inventory:**

This facility is not required to provide annual Emission Inventory reports per §2108.01.e of Article XXI because this facility does not have the potential to emit a total of:

- a) Ten (10) or more tons of any hazardous air pollutant;
- b) Twenty-five (25) or more tons of all hazardous air pollutant; or
- c) Twenty-five (25) or more tons of any other pollutant regulated under Article XXI.

**EMISSIONS SUMMARY:**

**Generator B001 Emission Limitations**

<b>POLLUTANT</b>	<b>Annual Emissions (tons/year)*</b>
Particulate Matter	<b>0.41</b>
Particulate Matter <10µm (PM <sub>10</sub> )	<b>0.41</b>
Particulate Matter <2.5µm (PM <sub>2.5</sub> )	<b>0.41</b>
Nitrogen Oxides (NO <sub>x</sub> )	<b>14.08</b>
Sulfur Oxides (SO <sub>x</sub> )	<b>0.01</b>
Carbon Monoxide (CO)	<b>0.08</b>
Volatile Organic Compounds (VOCs)	<b>0.41</b>
Greenhouse Gases (CO <sub>2</sub> e)	<b>244.25</b>

\* A year is defined as any consecutive 12-month period

**RECOMMENDATION:**

All applicable Federal, State, and County regulations have been addressed in the permit application. The facility is not subject to the restrictions of §2102.04.k of Article XXI because there have been no Notices of Violation issued for this or any other Allegheny County Jail in Allegheny County during the last 18 months. The Operating Permit for the Allegheny County Jail should be approved with the emission limitations, terms and conditions in Permit No. 0883.