

**ALLEGHENY COUNTY HEALTH DEPARTMENT
AIR QUALITY PROGRAM**

April 26, 2013

SUBJECT: Verizon Pennsylvania – Downtown 1C Building
416 7th Avenue
Pittsburgh, PA 15219

Operating Permit No. 0760

TO: Sandra L. Etzel
Chief Engineer

FROM: Gregson Vaux
Air Quality Engineer

FACILITY DESCRIPTION

Verizon-Pennsylvania is a broadcasting and communications company located at 416 7th Avenue in downtown Pittsburgh, PA. The company currently operates three (3) diesel burning emergency generators (1,000 kW, 1,500 kW, and 2,250 kW) at the 7th Avenue facility. All generators are operated only in the event that electric power from the local utility is interrupted, and for a maximum of two (2) hours per month for testing and maintenance. The facility is a synthetic minor source of particulate matter (PM), particulate matter <10 microns in diameter (PM₁₀), nitrogen oxides (NO_x), carbon monoxide (CO), sulfur oxides (SO_x), and volatile organic compounds (VOCs) as defined in §2101.20 of Article XXI.

The facility also houses seven (7) diesel fuel storage tanks (T001-T007) considered to be of minor significance and are exempted from permitting. [Article XXI §2102.04.a.5.L]

The emission units regulated by the operating permit are summarized in Table 1:

TABLE 1 Emission Unit Identification					
I.D.	SOURCE DESCRIPTION	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
EG001	Emergency Generator	Electronic Computer Controlled Fuel Injection	2250 kW	No. 2 Fuel Oil	S-1
EG002	Emergency Generator	None	1000 kW	No. 2 Fuel Oil	S-2
EG003	Emergency Generator	None	1500 kW	No. 2 Fuel Oil	S-2

OPERATING PERMIT DESCRIPTION

The operating permit is for the operation of three emergency generators listed above in Table 1. The operation of each generator is limited to 500 hours per year to qualify the source as a Synthetic Minor source and because they will be used during emergencies only. Only No. 2 fuel oil (diesel fuel) will be used in each of the three units. The installation permit (0760-I001) and the 2008 operating permit (0760) limit the sulfur content of the diesel fuel to 0.2%. This limit only holds true for the generators EG002 and EG003, which were installed prior to 2007. Generator EG001, installed in 2007, is subject to a different set of standards (40 CFR §60.4207), which limits the fuel sulfur content to ≤ 15 ppm (0.0015%) and (a cetane index ≥ 40 or an aromatic content ≤ 35). Emissions of SO_x are estimated from AP-42 data. Emissions limits for NO_x, CO and PM are set by manufacturer’s data for EG001, and by AP-42 estimates for EG002 and EG003.

PERMIT APPLICATION COMPONENTS:

1. Installation/Operating Permit Application No. 0760, dated February 7, 2013.
2. Synthetic Minor Operating Permit No. 0760, Issued August 7, 2008

EMISSION SOURCES:

TABLE 2 Emission Source Data			
Generators:			
Facility ID	EG001	EG002	EG003
Manufacturer	Caterpillar	Unknown	Caterpillar
Model	PBR00293	Unknown	25Z03417
Rated Capacity (kW)	2,250	1000	1500
Primary Fuel	No. 2 Fuel oil	No. 2 Fuel oil	No. 2 Fuel oil
Maximum Fuel Consumption (gph)	157.5	72.5	105.5
Secondary Fuel	None	None	None
Control Device	Electronic Computer- Controlled Fuel Injection	None	None
Stacks:			
Facility ID	S-1	S-2	
Stack Height (ft)	359	359	
Stack Diameter (ft)	2.0	2.0	
Exhaust Rate (acfm)	17,450	17,450	
Exhaust Temp (°F)	916	916	

METHOD OF DEMONSTRATING COMPLIANCE:

Compliance with the emission standards set in this permit will be demonstrated through records of manufacturer’s data, fuel consumption, operating hours, and cold starts. See Operating Permit No. 0760 for the specific conditions for determining compliance with the applicable requirements.

REGULATORY APPLICABILITY:

1. Article XXI Requirements for Issuance:

The requirements of Article XXI, §2103.12 for the issuance of operating permits have been met for this facility. Article XXI, §2104.01 for visible emissions, §2104.04 for odor and §2105.03 for operation and maintenance have been addressed in the permit.

2. BACT Analysis:

There are no add-on controls that are technically feasible and economically feasible. NO_x and CO emissions will be limited by limiting the hours of operation and by proper operation and maintenance according to manufacturer's specifications. SO_x emissions will be limited by the use of diesel fuel with a sulfur content not to exceed 0.2%.

3. Testing Requirements:

Testing is not required, but the Department reserves the right to require testing in the future to assure compliance with the terms and conditions of Operating Permit No. 0760.

4. New Source Performance Standards (NSPS):

The new emergency generator (EG001) is subject to the standards set forth in 40 CFR §60.4205(b). As part of the requirements in 40 CFR §60.4200, the engine manufacturer is required to certify the equipment to meet the standards of 40 CFR §60.4205(b), which for this unit, are the standards listed in 40 CFR §89.112 and 40 CFR §89.113.

5. NESHAP and MACT Standards:

The generators are not subject to any NESHAP or MACT standard.

6. 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.

EMISSIONS CALCULATIONS:

1. Fuel Burning / Combustion Equipment (New Generator EG001):

Calculations of emissions from the proposed generator are based on manufacturer specification information as given in Table 3, except for SO_x emissions. SO_x emissions are based on emission factors found in U.S. EPA AP-42 Table 3.4-1: "Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual-Fuel Engines" plus 15% for variability in the data.

Capacity:	2250 kW
Fuel Input:	22.05 MMBtuh
Hours of operation:	500 hours/year

$$\begin{aligned}\text{SO}_x \text{ Emission Rate} &= (1.01S_1\text{lb/MMBtu})(22.05 \text{ MMBtuh})(1.15), S_1 = \% \text{ Sulfur in Fuel Oil} \\ &= (1.01)(0.0015)(22.05)(1.15) \\ &= 0.038 \text{ lb/hr}\end{aligned}$$

$$(0.038 \text{ lb/hr})(500 \text{ hr/yr})/(2000 \text{ lb/ton}) = 0.01 \text{ tpy}$$

TABLE 3 Generator EG001 Emissions		
Pollutant	Emission Rate	
	(lb/hr)	(tpy)
PM	0.54*	0.14
PM ₁₀	0.54*	0.14
NO _x	65.88*	16.47
SO _x	0.038	0.01
CO	9.33*	2.33
HC	0.37*	0.09

* - From Manufacturer's RATED SPEED "Not to exceed data"

2. Fuel Burning / Combustion Equipment (Existing Generators EG002 & EG003):

Calculations of emissions from the generator being replaced are based on emission factors found in U.S. EPA AP-42 Table 3.4-1: "Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual-Fuel Engines" and Table 3.4-2: "Particulate and Particle Sizing Emission Factors for Large Uncontrolled Stationary Diesel Engines". 15% is added to the AP-42 data for variability in the data.

Unit	EG002	EG003
Capacity (kW)	1000	1500
Hours of operation per year	500	500
Fuel Input (MMBtuh)	10.15	14.77

EG002 and EG003 are not subject to the sulfur restrictions of 40 CFR 60.4200 since they were installed before 2007 (§60.4200.a.1.i)

Sample (for EG002):

$$PM = (0.0697 \text{ lb/MMBtu})(10.15 \text{ MMBtuh})(1.15) = 0.81 \text{ lb/hr}$$

$$(0.81 \text{ lb/hr})(500 \text{ hr/yr})/(2000 \text{ lb/ton}) = 0.20 \text{ tpy}$$

TABLE 4 Generators EG002 & EG003 Emissions					
Pollutant	AP-42 Factors (lb/MMBtu)	EG002 Emissions		EG003 Emissions	
		(lb/hr)	(tpy)	(lb/hr)	(tpy)
PM ¹	0.0697	0.81	0.20	1.18	0.30
PM ₁₀ ²	0.0573	0.67	0.17	0.97	0.24
NO _x	3.2	37.35	9.34	54.35	13.59
SO _x	1.01S ₁	2.36	0.59	3.43	0.86
CO	0.85	9.92	2.48	14.44	3.61

HC	0.09	1.05	0.26	1.53	0.38
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¹PM is total particulate, the sum of total filterable particulate and condensable particulate.

²PM₁₀ is the sum of filterable particulate less than 10 µm aerodynamic diameter and condensable particulate.

S₁ = %sulfur

EMISSIONS SUMMARY:

TABLE 5 Emission Limitations	
Pollutant	Annual Emissions (tons/year)
PM	0.63
PM ₁₀	0.55
NO _x	39.40
SO _x	1.46
CO	8.42
HC	0.74

¹PM is total particulate, the sum of total filterable particulate and condensable particulate.

²PM₁₀ is the sum of filterable particulate less than 10 µm aerodynamic diameter and condensable particulate.

RECOMMENDATION:

All applicable Federal, State, and County regulations have been addressed in the permit application and the facility was found to be in compliance. The installation permit for Verizon Pennsylvania, Inc. – Seventh Avenue should be approved with the emission limitations and terms & conditions set forth in Operating Permit No. 0760.