

ALLEGHENY COUNTY HEALTH DEPARTMENT AIR QUALITY PROGRAM

December 28, 2011

SUBJECT: Crafton Perishable & OK Grocery

755 Beechnut Drive
Pittsburgh, PA 15205
Allegheny County

Synthetic Minor Source Operating Permit No. 0607

TO: Sandra L. Etzel
Chief Engineer

FROM: David D. Good
Air Quality Engineer

FACILITY DESCRIPTION

OK Grocery Perishables Warehouse (OK Grocery) is a cold storage facility for perishable grocery items, which utilizes an ammonia (anhydrous) refrigeration system. This refrigeration system contains more than the threshold quantity of anhydrous ammonia listed in Table 1 to §68.130 and is subject to 40 CFR Part 86 – Chemical Accident Prevention Provisions. The EPA Facility Identifier is: 1000 0015 3585.

OK Grocery also operates and maintains a 2,000 kW (Crafton Perishable) emergency generator and a 1,750 kW (OK Grocery) emergency generator that is enrolled in PJM's Emergency Load Response Program ("ELRP") for its contiguous sites located at 735 & 755 Beechnut Drive in Pittsburgh, PA. Both engines are owned by Giant Eagle, Inc.

This facility is a synthetic minor source of nitrogen oxides (NO_x) and carbon monoxide (CO), and a minor source of particulate matter (PM), particulate matter <10 µm in diameter (PM₁₀), particulate matter <2.5 µm in diameter (PM_{2.5}), sulfur dioxide (SO₂), and volatile organic compounds (VOCs) as defined in §2101.20 of Article XXI.

PERMIT APPLICATION COMPONENTS:

1. Operating Permit Application No. 0607, dated September 6, 2011.

EMISSION SOURCES:

Generators

I.D.	Facility Name	Manufacturer / Model #	Maximum Capacity	Primary Fuel	Secondary Fuel	Control	Stack I.D.
B01	Emergency Generator	Kohler 2000ROZD4	2,000 kW	No. 2 Fuel Oil	none	none	S001
B02	Emergency Generator	Caterpillar XQ1750	1,750 kW	No. 2 Fuel Oil	none	none	S002
P001	Cold Storage	--	31,000 lbs	Anhydrous Ammonia	none	none	--
D001	Diesel Fuel Storage Tank	--	1,250 gallons	No. 2 Fuel Oil	none	none	--

D002	Diesel Fuel Storage Tank	--	2,000 gallons	No. 2 Fuel Oil	none	none	--
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Stacks

Stack I.D.	Stack Height	Stack Diameter	Exhaust Rate	Exhaust Temp.	Exhaust Moisture	Material
S001	13.3 ft.	1.4 ft.	15,000 acfm	824 °F	--	steel; n/a
S002	14.0 ft	1.0 ft.	15,000 acfm	824 °F	--	steel; n/a

PROCESS DESCRIPTIONS:

OK Groceries Perishables Warehouse is a cold storage facility that uses an ammonia (anhydrous) refrigeration system. The maximum capacity of anhydrous ammonia is 31,000 pounds. The threshold quantity of this regulated toxic substance, as listed in Table 1 to §68.130, is 10,000 pounds.

MAXIMUM RELEASE RATE OF ANHYDROUS AMMONIA:

According to the Risk Management Plan submitted by OK Grocery, Inc. on June 21, 2004, the worstcase toxic release is that 31,000 lbs of liquid anhydrous ammonia will be released and vaporize to a gas over a period of 100 minutes. Based on this scenario, the release rate to the atmosphere is 310 lbs of ammonia per minute. The distance to the toxic end point is 2.0 miles, which is beyond the OK Groceries Perishables Warehouse property boundary and there are public receptors located within the distance to the end point. According to §68.3, Public receptor means offsite residences, institutions (e.g., schools, hospitals), industrial, commercial, and office buildings, parks, or recreational areas inhabited or occupied by the public at any time without restriction by the stationary source where members of the public could be exposed to toxic concentrations, radiant heat, or overpressure, as a result of an accidental release.

PREVENTION PROGRAM 3 APPLICABILITY:

OK Groceries Perishables Warehouse falls under Prevention Program 3 applicability requirements in §68.10(d) because the distance to a toxic endpoint for a worst-case release assessment is greater than the distance to any public receptor and the facility is subject to OSHA’s Process Safety Management Standard. The Prevention Program 3 requirements are presented in 40 CFR Part 68, Subpart D.

METHODS OF DEMONSTRATING COMPLIANCE:

The permittee shall certify that they have evaluated compliance with the provisions of 40 CFR Part 68, Subpart D at least every three years to verify that procedures and practices developed under Subpart D are adequate and are being followed. The permittee shall promptly determine and document an appropriate response to each of the findings of the compliance audit, and document that deficiencies have been corrected. The Allegheny County Health Department shall conduct periodic inspections of the OK Groceries Perishables Warehouse to determine compliance with the applicable provisions of 40 CFR Part 68.

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. 0607 for the specific conditions for determining compliance with the applicable requirements.

EMERGENCY RESPONSE:

OK Groceries Perishables Warehouse employees will respond to accidental releases of anhydrous ammonia and their emergency response plan is included in the Allegheny County Local Emergency Planning Commission (LEPC) emergency response plan.

REGULATORY APPLICABILITY:

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

See Permit Application No. 0607 Section 5: Applicable Requirements. 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.

§2103.12.a.2.B (Standards for Issuance): Existing sources, where no limits have been established under Article XXI, are subject to Reasonably Available Control Technology (RACT) requirements.

a. The Department has determined that RACT shall be:

- The use of ultra low sulfur fuel oil with 15 ppm sulfur content, low usage option and good combustion practice.

2. **Testing Requirements:**

Testing is not required. However, the Department reserves the right to require additional testing if necessary in the future to assure compliance with the terms and conditions of Operating Permit No. 0607.

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

The facility is not subject to 40 CFR Part 60, Subpart III – *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*. The generators were both installed in 1999, before the applicability date of the NSPS.

4. **NESHAP and MACT Standards:**

The facility is not subject to any NESHAP or MACT standards. 40 CFR Part 63, Subpart ZZZZ does not apply to this facility based on §63.6590(b)(3) which states: "...or an existing stationary residential, commercial, or institutional emergency stationary RICE located at an area source of HAP emissions, does not have to meet the requirements of this subpart and of subpart A of this part."

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

The facility is subject to CAA §112(r) due to the storage of ammonia (CAS# 7664-41-7). There is a risk management plan in place at the facility.

6. **Title 40 – Code of Federal Regulations, Part 68 – Chemical Accident Prevention Provisions:**

The facility is subject to the following subparts of CFR Title 40, Part 68:

- Subpart A – General
- Subpart B – Hazard Assessment
- Subpart D – Program 3 Prevention Program
- Subpart E – Emergency Response
- Subpart F – Regulated Substances for Accidental Release Prevention
- Subpart G – Risk management Plan
- Subpart H – Other Requirements

EMISSIONS CALCULATIONS:

Emergency Generator (B01 – Crafton Perishable)

Generator Rating:	2,000 kW
Fuel Use:	133 gal/hr
No. of Generators:	1 (one)
Fuel Oil Sulfur Limit:	0.0015%
Operation:	500 hrs/yr (60 hours non-emergency ELRP, 440 hours emergency use)

Emissions are based on data supplied by the manufacturer (see permit application #0607-I001) and AP-42, Section 3.4. Because particulate matter and sulfur oxide emissions based on manufacturer information and AP-42 are less than the limit in Article XXI, §2104.02(a)(1)(B) and §2104.03(a)(2)(A), the Article XXI limits have been streamlined into the manufacturer's limits. All PM is assumed to be PM₁₀, and all PM₁₀ is assumed to be PM_{2.5}.

$$\begin{aligned}\text{Article XXI: } & 0.28 \text{ lb}_{\text{PM}}/\text{MMBtu} \times 133 \text{ gal/hr} \times 130,000 \text{ Btu/gal} = 4.84 \text{ lb}_{\text{PM}}/\text{hr} \\ & 1.0 \text{ lb}_{\text{SO}_x}/\text{MMBtu} \times 133 \text{ gal/hr} \times 130,000 \text{ Btu/gal} = 17.27 \text{ lb}_{\text{SO}_x}/\text{hr}\end{aligned}$$

From the manufacturer specifications, the maximum brake horsepower is 2,935 bhp.

The Nitrogen Oxides were calculated using EPA AP-42, Section 3.4, Table 3.4-1

$$\text{NO}_x/\text{hr} = 0.024 \text{ lb/hp-hr} \times 2,935 \text{ hp} = 70.44 \text{ lb/hr}$$

Emergency Generator B01 Emission Limits

Pollutant	Short-Term Emissions (lb/hr)	Long-Term Emissions [500 hours/year] (tons/year)
Particulate Matter	2.05	0.5
PM ₁₀	2.05	0.5
PM _{2.5}	2.05	0.5
Nitrogen Oxides	70.44	17.6
Sulfur Oxides	0.04	0.01
Carbon Monoxide	16.14	4.0
Volatile Organic Compounds	2.07	0.5

Emergency Generator (B02 – OK Grocery)

Generator Rating:	1,750 kW
Fuel Use:	133.2 gal/hr
No. of Generators:	1 (one)
Fuel Oil Sulfur Limit:	0.0015%
Operation:	500 hrs/yr (60 hours non-emergency ELRP, 440 hours emergency use)

Emissions are based on data supplied by the manufacturer (see permit application #0607-I001) and AP-42, Section 3.4. Because particulate matter and sulfur oxide emissions based on manufacturer information and AP-42 are less than the limit in Article XXI, §2104.02(a)(1)(B) and §2104.03(a)(2)(A), the Article XXI limits have been streamlined into the manufacturer's limits. All PM is assumed to be PM₁₀, and all PM₁₀ is assumed to be PM_{2.5}.

Article XXI: $0.28 \text{ lb}_{\text{PM}}/\text{MMBtu} \times 133.2 \text{ gal/hr} \times 130,000 \text{ Btu/gal} = 4.85 \text{ lb}_{\text{PM}}/\text{hr}$
 $1.0 \text{ lb}_{\text{SO}_x}/\text{MMBtu} \times 133.2 \text{ gal/hr} \times 130,000 \text{ Btu/gal} = 17.32 \text{ lb}_{\text{SO}_x}/\text{hr}$

The manufacturer supplied the following equation for sulfur emissions when combusting ultra low-sulfur diesel:

$$\text{SO}_2 \text{ g/hr} = 0.01998 \times \text{fuel rate (g/hr)} \times \text{S\%}$$

$$0.01998 \times 133.2 \text{ gal/hr} \times 3.79 \text{ L/gal} \times 838.9 \text{ g/L} \times 0.0015 \div 453.6 \text{ g/lb} = \mathbf{0.028 \text{ lb/hr SO}_x}$$

From the manufacturer specifications, the maximum brake horsepower is 2,347 bhp.

The Nitrogen Oxides were calculated using EPA AP-42, Section 3.4, Table 3.4-1

$$\text{NO}_x/\text{hr} = 0.024 \text{ lb/hp-hr} \times 2,347 \text{ hp} = 56.32 \text{ lb/hr}$$

Emergency Generator B02 Emission Limits

Pollutant	Short-Term Emissions (lb/hr)	Long-Term Emissions [500 hours/year] (tons/year)
Particulate Matter	1.64	0.4
PM ₁₀	1.64	0.4
PM _{2.5}	1.64	0.4
Nitrogen Oxides	56.32	14.1
Sulfur Oxides	0.03	0.01
Carbon Monoxide	12.91	3.2
Volatile Organic Compounds	1.65	0.4

Diesel Fuel Storage Tank

VOC emissions from the diesel fuel storage tanks are negligible (< 0.0005 tpy) using Tanks 4.0.9D.

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 Giant Eagle Inc. – Crafton Perishable & OK Grocery at 735 & 755 Beechnut Drive should be approved with the emission limitations and terms & conditions in Operating Permit No. 0607.