Georgia Department of Natural Resources

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NARRATIVE

TO: Richard McDonald

FROM: Jeng-Hon Su

DATE: July 20, 2004

Facility Name:	**Coca Cola Base Beverage Plant**
Location:	Atlanta, GA (Fulton County)
Application #:	15377
Date of Application:	May 19, 2004

General Information

Coca Cola Base Beverage Plant (hereinafter facility) has submitted Application No. 15377, dated May 19, 2004, for the construction and operation of one 16.3 MM Btu/hr boilers (source code B003) to replace one existing 10.5 MM Btu/hr boiler (source code B001). The facility is located at 1001 Great Southwest Parkway, Atlanta (Fulton County).

The facility is located inside the Atlanta ozone non-attainment area. It is a minor source under Title V of the CAAA of 1990 and Non-attainment Area New Source Review (NAA NSR) because facility-wide PTE for every criteria pollutant is below the major source threshold (25 tpy for NOx and VOC, 100 tpy for CO, PM, and SO_2).

A public advisory has been issued and any public comments were due by July 9, 2004. No comments were received.

Applicable Rules and Source Classification

The State Rules that apply to this facility are Georgia Air Quality Rules **391-3-1-.02(2)(d)** "Fuel-burning Equipment," **391-3-1-.02(2)(g)** "Sulphur Dioxide," and **391-3-1-.02(2)(lll)** "NOx Emissions from Fuel Burning Equipment."

The Federal Regulations that apply to the new boiler (source code B003) are 40 CFR 60, Subpart A "General Provisions," and Subpart Dc "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units."

Current and Active Permit

- Permit No. **2086-060-11128** issued to The Coca-Cola Company, on March 12, 1993.

Process Description

Coca Cola Base Beverage Company was constructed in Year 1969 and began operation in Year 1970. The facility houses a number of tanks and mixing operations used to prepare the beverage syrup. The tanks and mixing equipment currently emit below permitting thresholds and are not subject to any federal regulatory requirements. The facility also operates two 10.5 MM Btu/hr boilers (source codes B001 and B002) to provide heat for the facility. The boilers fire natural gas and No. 2 fuel oil and operate under SIP Permit No. 2086-060-11128 that was issued on March 12, 1993. Coca Cola plans to replace one of the existing boilers (source code B001) with a new 16.3 MM Btu/hr boiler (source code B003) that also fires natural gas and No. 2 fuel oil and is equipped with low NOx burners.

Allowable Emission Rate

[Rule (d)]
Equipment constructed after January 1, 1972, with heat capacity equal to or greater than 10 MM Btu/hr, and equal to/less than 250 MM Btu/hr, may not emit particulate matter at a rate greater than that determined by the following equation:

$$P = 0.5 * (10 / R)^{0.5}$$

where P = allowable emission of particulate matter in pounds per million BTU heat input
R = heat input of fuel-burning equipment in million BTU per hour

The allowable particulate emission rates and calculations regarding new Boiler B003 are shown in the following table.

Name/Source Code	Heat Input Rate (R) (MM Btu/hr)	Allowable Emission Rate (P) (lbs PM / MM Btu heat input)	Fuel
Boiler B003	16.3	$P = 0.5 * (10 / 16.3)^{0.5} = 0.392$	N.G./No. 2 Fuel Oil

Compliance with Rule (d), when new Boiler B003 fires natural gas, is expected because natural gas is considered a clean fuel. Compliance with Rule (d), when Boiler B003 fires on No. 2 fuel oil, is expected based on the following calculation:

AP-42 PM emission factor for No. 2 oil-fired boilers = 2 lb./10^3 gal
Heating value of No. 2 fuel oil = 140,000 Btu/gal
(2 lb / 1,000 gal) * (1,000 gal / 140,000,000 Btu) * (1,000,000 Btu / 1 MM Btu) = 0.0143 lb/MM Btu

When firing at 16.3 MM Btu/hr: 0.0143 lb/MM Btu $<<$ 0.392 lb/MM Btu (Allowable Emission Rate)

Therefore, compliance with Rule (d) is expected.

[Rule (lll)]
New Boiler B003 is subject to Georgia Rule 391-3-1-.02(2)(lll), "NOx Emissions from Fuel-burning Equipment." Georgia Rule (lll) subjects the units to a NOx emission standard of 30 ppm at 3% oxygen (on a dry basis); this requirement only applies from May 1st through September 30th (ozone season) of each year. EPD requires compliance with this NOx limit at the time of startup. The new boiler (source code B003) is equipped with low NOx burners and the facility will fire only natural gas during ozone season in order to comply with the standard set by Georgia Rule (lll).

The facility reports that NOx emission rate is 0.035 lb/MM Btu from new Boiler B003, based on the emission data provided by the manufacturer. The emission rate can be converted to 28.8 ppm from B003, at 3% oxygen (on a dry basis) by using the equations listed in 40 CFR 60 Appendix A Method 20.

$E = C_d * F_d * 20.9 / (20.9 - \%O_2)$ Eq. 20-6 $\rightarrow$ $C_d = [E * (20.9 - \%O_2)] / [F_d * 20.9]$

E = Mass Emission Rate of Pollutant (lb/MM Btu)
C_d = Pollutant Concentration (lb/scf or ppm)
C_{adj} = Pollutant Concentration Corrected to 3% O_2
Conversion Factor from ppm to lb/scf = $1.194 * 10^{-7}$
F_d = 8,710 dscf / MM Btu (for natural gas)

$C_{adj} = C_d * (20.9 – 3) / (20.9 - \% O_2)$ Eq. 20-4 $\rightarrow$ C_{adj} (ppm) = $[E * 17.9] / [F_d * 20.9 * 1.194*10^{-7}]$

B003 NOx Emission Rate: $C1_{adj}$ (ppm) $= [0.035 * 17.9] / [8,710 * 20.9 * 1.194*10^{-7}]$
$= 28.8$ ppm $<$ 30 ppm

Compliance with Rule (lll) is expected as long as the facility fires natural gas only from May 1st through September 30th of each year. The facility will be required to conduct an initial performance test on the new boiler (source code B003) in order to determine the compliance of Rule (lll).

Potential Emissions

The facility provided manufacturer's emission factors of all criteria pollutants for the new boiler (source code B003). Emission factors for the existing boiler (source code B002) can be found in AP-42 Chapters Chapter 1.3, "Fuel Oil Combustion," and Chapter 1.4, "Natural Gas Combustion." Hazardous air pollutants (HAPs) emission factors for both of the new and existing boilers (source codes B002 and B003) can be found in AP-42 Chapters Chapter 1.3, "Fuel Oil Combustion," and Chapter 1.4, "Natural Gas Combustion." The operating hours for all processes are unlimited (8,760 hrs/yr). The new boiler (source code B003) is limited to fire natural gas only from May 1st to September 30th of each year in order to comply with the standards set Georgia Rule (lll).

The Potential to Emit (PTE) data can be found in the following table; and the calculations are shown after the table.

Table 1. Facility Potential-to-Emit

Pollutant	Potential-to-Emit (tons per year)
CO	7.80
NOx	15.5
SO_2	44.7
VOC	3.87
PM	1.95
Total HAPs	0.219

Manufacturer's Emission Factors for new Boiler B003:

Natural Gas
$CO = 0.037$ lb / MM Btu
$NOx = 0.035$ lb / MM Btu
$SO_2 = 0.001$ lb / MM Btu
$VOC = 0.016$ lb / MM Btu
$PM = 0.010$ lb / MM Btu

No. 2 Fuel Oil
$CO = 0.07$ lb / MM Btu
$NOx = 0.19$ lb / MM Btu
$SO_2 = 0.515$ lb / MM Btu
$VOC = 0.03$ lb / MM Btu
$PM = 0.024$ lb / MM Btu

AP-42 Emission Factors:

Heat Content of No. 2 Fuel Oil = 140 MM Btu / 10^3 gal = 0.140 MM Btu / gal
Heat Content of Natural Gas = 1,020 MM Btu / 10^6 ft^3

Chapter 1.4. - Natural Gas
$CO = 84$ lb / 10^6 ft^3
$NOx = 100$ lb / 10^6 ft^3
$SO_2 = 0.6$ lb / 10^6 ft^3
$VOC = 5.5$ lb / 10^6 ft^3
$PM = 7.6$ lb / 10^6 ft^3
Total HAP = 1.9 lb / 10^6 ft^3

Chapter 1.3. - No. 2 Fuel Oil
$CO = 5$ lb / 10^3 gal
$NOx = 20$ lb / 10^3 gal
$SO_2 = 71$ lb / 10^3 gal (0.5% S)
$VOC = 0.34$ lb / 10^3 gal
$PM = 2$ lb / 10^3 gal
Total HAP = 0.08 lb / 10^3 gal

Capacity of the New Boiler (source code B003) = 16.3 MM Btu/hr
Capacity of the Existing Boiler = 10.5 MM Btu/hr

Annual Hours of Operations during Ozone Season (new boiler)
= (31 days + 30 days + 31 days + 31 days + 30 days) * (24 hrs / day)
= 3,672 hrs / yr

Hours of Operations during Periods outside Ozone Season (new boiler)
= 8,760 hrs/yr – 3,672 hrs/yr
= 5,088 hrs/yr

CO Emissions

CO PTE from the Existing Boiler B002 (worst case is firing natural gas year round)
= (10.5 MM Btu/hr) * (10^6 ft^3 N.G. / 1,020 MM Btu) * (84 lbs CO / 10^6 ft^3 N.G.) * (8,760 hrs/yr) * (1 ton / 2,000 lbs)
= 3.79 tons CO / yr

CO PTE from New Boiler B003 (worst case is firing natural gas during ozone season and firing No. 2 fuel oil for the rest of the year)
= (16.3 MM Btu/hr) * [(0.037 lb CO / MM Btu) * (3,672 hrs/yr) + (0.07 lb CO / MM Btu) * (5,088 hrs/yr)] * (1 ton / 2,000 lbs)
= 4.01 tons CO / yr

Facility-Wide CO PTE = 3.79 + 4.01 = 7.80 tpy CO < 100 tpy

NOx Emissions

NOx PTE from the Existing Boiler B002 (worst case is firing No 2. fuel oil year round)
= (10.5 MM Btu/hr) * (10^3 gal No. 2 fuel oil / 140 MM Btu) * (20 lbs NOx / 10^3 gal No. 2 fuel oil) * (8,760 hrs/yr) * (1 ton / 2,000 lbs)
= 6.57 tons NOx / yr

NOx PTE from New Boiler B003 (worst case is firing natural gas during ozone season and firing No. 2 fuel oil for the rest of the year)
= (16.3 MM Btu/hr) * [(0.035 lb NOx / MM Btu) * (3,672 hrs/yr) + (0.19 lb NOx / MM Btu) * (5,088 hrs/yr)] * (1 ton / 2,000 lbs)
= 8.93 tons NOx / yr

Facility-Wide NOx PTE = 6.57 + 8.93 = 15.5 tpy NOx < 25 tpy

The new boiler (source code B003) is required to equip low NOx burners and fire natural gas exclusively during ozone season in order to comply with the Rule (lll) standard. According to the manufacturer's emission factors, the new boiler (source code B003) emits more NOx emissions when it fires No. 2 fuel oil. Will the facility-wide NOx PTE be greater than 25 tpy if the new boiler (source code B003) fires No. 2 fuel oil year round?

NOx PTE from New Boiler B003 (if it can fire No. 2 fuel oil year round)
= (16.3 MM Btu/hr) * (0.19 lb NOx / MM Btu) * (8,760 hrs/yr) * (1 ton / 2,000 lbs)
= 13.6 tons NOx / yr

Facility-Wide NOx PTE (if new Boiler B003 can fire No. 2 fuel oil year round)
= 6.57 + 13.6
= 20.2 tpy NOx < 25 tpy

SO_2 Emission

SO_2 PTE from the Existing Boiler B002 (worst case is firing No 2. fuel oil year round)
= (10.5 MM Btu/hr) * (10^3 gal No. 2 fuel oil / 140 MM Btu) * (71 lbs SO_2 / 10^3 gal No. 2 fuel oil) * (8,760 hrs/yr) * (1 ton / 2,000 lbs)
= 23.3 tons SO_2 / yr

SO_2 PTE from New Boiler B003 (worst case is firing natural gas during ozone season and firing No. 2 fuel oil for the rest of the year)
= (16.3 MM Btu/hr) * [(0.001 lb SO_2 / MM Btu) * (3,672 hrs/yr) + (0.515 lb SO_2 / MM Btu) * (5,088 hrs/yr)] * (1 ton / 2,000 lbs)
= 21.4 tons SO_2 / yr

Facility-Wide SO_2 PTE = 23.3 + 21.4 = 44.7 tpy SO2 < 100 tpy

Will the facility-wide SO_2 PTE be greater than 100 tpy if the new boiler (source code B003) fires No. 2 fuel oil year round?

SO_2 PTE from New Boiler B003 (if it can fire No. 2 fuel oil year round)
= (16.3 MM Btu/hr) * (0.515 lb SO_2 / MM Btu) * (8,760 hrs/yr) *(1 ton / 2,000 lbs)
= 36.8 tons SO2 / yr

Facility-Wide SO_2 PTE (if new Boiler B003 can fire No. 2 fuel oil year round)
= 23.3 + 36.8
= 60.1 tpy SO_2 < 100 tpy

VOC Emissions

VOC PTE from the Existing Boiler B002 (worst case is firing natural gas year round)
= (10.5 MM Btu/hr) * (10^6 ft^3 N.G. / 1,020 MM Btu) * (5.5 lbs VOC / 10^6 ft^3 N.G.) * (8,760 hrs/yr) * (1 ton / 2,000 lbs)
= 0.248 ton VOC / yr

VOC PTE from New Boiler B003 (worst case is firing natural gas during ozone season and firing No. 2 fuel oil for the rest of the year)
= (16.3 MM Btu/hr) * [(0.016 lb VOC / MM Btu) * (3,672 hrs/yr) + (0.03 lb VOC / MM Btu) * (5,088 hrs/yr)] * (1 ton / 2,000 lbs)
= 1.72 tons VOC / yr

According to the additional information submitted by the facility's consultant, Judy O'Neil, on July 20, 2004, potential VOC emissions from all tanks and mixing operations are estimated to be 1.90 tons per year.

Facility-Wide VOC PTE = 0.248 + 1.72 + 1.90 = 3.87 tpy VOC < 25 tpy

PM Emissions

PM PTE from the Existing Boiler B002 (worst case is firing No 2. fuel oil year round)
= (10.5 MM Btu/hr) * (10^3 gal No. 2 fuel oil / 140 MM Btu) * (2 lbs PM / 10^3 gal No. 2 fuel oil) * (8,760 hrs/yr) * (1 ton / 2,000 lbs)
= 0.657 ton PM / yr

PM PTE from New Boiler B003 (worst case is firing natural gas during ozone season and firing No. 2 fuel oil for the rest of the year)
= (16.3 MM Btu/hr) * [(0.010 lb PM / MM Btu) * (3,672 hrs/yr) + (0.024 lb PM / MM Btu) * (5,088 hrs/yr)] * (1 ton / 2,000 lbs)
= 1.29 tons PM / yr

Facility-Wide PM PTE = 0.657 + 1.29 = 1.95 tpy PM < 100 tpy

HAPS Emissions

HAPs PTE from the Existing Boiler B002 (worst case is firing natural gas year round)
= (10.5 MM Btu/hr) * (10^6 ft^3 N.G. / 1,020 MM Btu) * (1.9 lbs HAPs / 10^6 ft^3 N.G.) * (8,760 hrs/yr) * (1 ton / 2,000 lbs)
= 0.0857 ton HAPs / yr

HAPs PTE from New Boiler B003 (worst case is firing natural gas year round)
= (16.3 MM Btu/hr) * (10^6 ft^3 N.G. / 1,020 MM Btu) * (1.9 lbs HAPs / 10^6 ft^3 N.G.) * (8,760 hrs/yr) * (1 ton / 2,000 lbs)
= 0.133 ton HAPs / yr

Facility-Wide HAPs PTE = 0.0857 + 0.133 = 0.219 tpy HAPs < 10/25 tpy

As shown above, with the operating limit due to the Rule (lll) standard, PTE's for CO, VOC, PM, and HAPs are much lower than the Title V major source thresholds, 100 tpy, 25 tpy, 100 tpy, 10/25 tpy, respectively. PTE's for NOx and SO2, even without any operating limits, are still lower than the Title V major source thresholds, 25 tpy and 100 tpy, respectively. Thus, this facility is a true minor source under Title V.

Conditions

Standard permit conditions have been added to the proposed Permit. The NOx emission limit specified in Georgia Rule (lll) has been added into Condition 2.5. Condition 6.2 will require the facility to conduct an initial performance test for nitrogen oxides emissions from the new boiler (source code B003). After the initial performance test, Condition 5.3 will require the facility to conduct periodic monitoring measurements to determine compliance with the Rule (lll) standard in Condition 2.5. Conditions 7.6 and 7.7 will require the facility to maintain records of all measurements conducted in accordance with Condition 5.3 and submit any excursions within the semiannual report. NSPS Subpart Dc requirements have been added into Conditions 2.1, 5.2, and 7.5. Condition 7.4 will require the facility to submit written notification of the actual date that the new boiler (source code B003) becomes operational, within 15 days after such date. Condition 7.9 will require the facility to submit verification that all fuel oil received during the reporting period complies with the sulfur content limits specified in Conditions 2.1 and 2.4. Finally, Condition 8.2 revokes the existing SIP Permit No. 2086-060-11128 that was issued on March 12, 1993, in its entirety.

Conclusion

I recommend that new permit No. 2086-121-0703-B-01-0 be issued to this facility. A public advisory was issued on June 10, 2004 for the new boiler (source code B003); any comments were due by July 9, 2004. No Comments were received. The Mountain District (Cartersville) Office is responsible for inspections and complaints/investigations.