

APPENDIX 6 SULFUR DIOXIDE EMISSION STANDARDS

SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES: 15A NCAC 2D .0516

In **15A NCAC 2D .0516** the emissions limit of 2.3 pounds of sulfur dioxide per million Btu is a stack limitation and not a fuel sulfur-content limitation.

The sulfur dioxide emission standards in **15A NCAC 2D .0516** is an instantaneous standard. However, the testing and monitoring rules describe the time over which samples are to be taken to determine compliance with this standard. When Method 6 is used to determine compliance, the average of six 20-minute samples is used to determine compliance (**15A NCAC 2D .0501(c)(4)**). When continuous emission monitoring is used, compliance is determined using a 24-hour block average (**15A NCAC 2D .0606 (c)** and **2D .0608(e)**). If fuel analysis is used, compliance is based on the average sulfur content, as determined by the appropriate ASTM procedures, of each shipment (**15A NCAC 2D .0608(f)**). If fuel analysis is used to demonstrate compliance with the ambient air quality standards, then a composite sample is taken over a 3-hour or 24-hour period, depending on the ambient standard in question (**15A NCAC 2D .0501(c)(4)**).*

Rule **15A NCAC 2D .0516(b)** states that a source subject to **15A NCAC 2D .0524**, New Source Performance Standards, shall meet that standard. Rule **15A NCAC 2D .0516(b)** also references several other rules with sulfur dioxide standards. This requirement should be understood to

*Thomas Allen to Gregg Davis, "Sulfur Dioxide Emission Standard" 9 Nov. 1999 (memorandum).

mean that if the source is subject to a sulfur dioxide standard in one of the Rules identified in Paragraph (b), it is not subject to the 2.3-lb/million Btu limit of **15A NCAC 2D .0518**.*

Aluminum Pot Lines

Aluminum pot lines at primary aluminum plants are not considered a source of combustion. Therefore, **15A NCAC 2D .0516** does not apply to this type of source. The facility has to comply with the ambient air quality standards for sulfur dioxide. Thus, requiring a modeling demonstration to assure compliance with the ambient air quality standards may be appropriate.†

SULFUR DIOXIDE SOURCES WITH SPECIAL SIP CONDITIONS

SO₂ LIMITATIONS AS PERMITTED AND RECORDED IN PUBLIC HEARINGS:

PUBLIC HEARING JULY 6, 1982-DUKE POWER, CLIFFSIDE (PERMIT NO. 4044R4)

Background:

The permit for Duke Power Company's Cliffside Steam Station contains a condition that limits the emissions of sulfur dioxide to 2.2 lb/million Btu.

Equipment:

2 coal-fired boilers (435 x 10⁶ Btu per hour heat input each) in operation.

2 coal-fired boilers (698 x 10⁶ Btu per hour heat input each) in operation.

1 coal-fired boiler (5,950 x 10⁶ Btu per hour heat input) in operation.

Limitations:

#1-. . . in no case shall the sulfur dioxide emissions from the boilers exceed 2.2 pounds per million Btu input.

*Thom Allen to Ed Martin, "Re: NSPS," 5 Apr. 2000 (e-mail).

†Brock Nicholson to Michael Landis and Keith Overcash, "Sulfur Dioxide from Sulfur in Coke Used for Anode in Aluminum Pot Lines," 25 Mar. 1994 (memorandum).

PUBLIC HEARING DECEMBER 19, 1984-APPALACHIAN STATE UNIVERSITY (PERMIT NO.3990R4)

Background:

The permit for Appalachian State University allows sulfur dioxide to be emitted at the rate of 1.7 pounds per million Btu from its wood/coal-fired boiler and 1.55 pounds per million Btu from its residual oil-fired boilers.

Equipment:

3 No. 6 oil-fired boilers(100, 60, and 37.5 million Btu per hour maximum heat input, respectively) in operation.

1 wood/coal-fired boiler(32 million Btu per hour maximum heat input for wood and 35 million Btu per hour maximum heat input for coal) in operation.

Limitations:

#5-Sulfur dioxide emissions from the three (3) No. 6 oil-fired boilers (Nos. 1, 2, and 3) shall not exceed 1.55 pounds per million Btu heat input.

#6-Sulfur dioxide emissions from the wood/coal-fired boiler (No. 4) shall not exceed 1.7 pounds per million Btu heat input.

#7-No more than two boilers shall operate at the same time, including start-up and shut-down.

#8-The sulfur content of the No. 6 oil burned shall not exceed 1.4% by weight.

#9-The sulfur content of the coal burned shall not exceed 1.1% by weight.

#10-The maximum heat inputs to boilers 1, 2, 3, and 4 shall not exceed 100, 60, 37.5, and 35 million Btu per hour, respectively.

#11-At no time shall the wood/coal-fired boiler burn more than 4000 pounds of wood per hour.

PUBLIC HEARING MARCH 27, 1986-ECUSTA CORPORATION, MAIDEN KNITTING, LIGGETT AND MYERS TOBACCO COMPANY, TEXASGULF CHEMICAL COMPANY, ALBA WALDENSIAN P & W PLANT, ALBA WALDENSIAN JOHN LOUIS PLANT, VALDESE MANUFACTURING COMPANY AND BURLINGTON INDUSTRIES.

Background:

The permits for these facilities were considered at this hearing. Permits for four of these facilities contain conditions limiting emissions or operations. Permits for the other four facilities contain no special operating restrictions or emission limits.

The four facilities requiring permits with special limitations are Ecusta Corporation, Maiden Knitting, Liggett and Myers Tobacco

Company, and Texasgulf Chemical Company. The permit for Ecusta Corporation limits sulfur dioxide emissions from its boilers to 1.6 pounds per million Btu. The permit for Maiden Knitting Mills limits the quantity of fuel used and sulfur dioxide emissions to 1.6 pounds per million Btu. The permit for Liggett and Myers Tobacco Company prohibits firing the coal-fired boiler and any of the three no. 6 oil-fired boilers at the same time except during startup and shutdown. There are two permits for Texasgulf Chemicals Company. One of the permits limits sulfur dioxide emissions from Sulfuric Acid Plant No. 2 to four pounds per ton of sulfuric acid produced. The other permit limits the sulfur dioxide emissions for the No. 2 oil-fired boiler to 0.3 pounds per million Btu and for the No.6 oil-fired boiler to 1.6 pounds per million Btu.

The four facilities that required no special operating restrictions or emission limits are Alba Waldensian P & W Plant, Alba Waldensian John Louis Plant, Valdese Manufacturing Company, and Burlington Industries. These permits were considered at the hearing because these four facilities did not have an approved implementation plan that would allow them to emit sulfur dioxide at 2.3 pounds per million Btu.

Ecusta (permit no. 3644R6- draft)

Equipment:

1 No. 5 oil-fired boiler (55.7 million Btu per hour maximum heat input) in operation.

1 Coal-fired boiler (71.6 million Btu per hour maximum heat input) in operation.

3 Coal-fired boilers (110, 110, and 162 million Btu per hour maximum heat input respectively) in operation.

1 Coal-fired boiler (244 million Btu per hour maximum heat input) in operation.

1 TRS gas incinerator (1 million Btu per hour burner) installed on the exhausts of batch digesters in operation.

Limitations:

#1-. . . in no case shall the sulfur dioxide emissions from boilers exceed 1.6 pounds per million Btu.

Maiden Knitting Mills (permit no. 3922R3)

Equipment:

1 natural gas/No. 6 oil boiler (43.8 million Btu per hour maximum heat input) under construction.

2 natural gas/No. 6 oil boilers (25.1 and 33.5 million Btu per hour maximum heat input, respectively) in operation.

1 textile dryer in operation.

3 natural gas fired circular knit textile fabric dryers in operation.

Limitations:

#3–The total annual No. 6 fuel oil usage shall not exceed 300,000 gallons.

#4–In no case shall the total combined No. 6 fuel consumption of the three boilers exceed 622 gallons per hour.

#5–In no case shall the sulfur dioxide emissions from the boilers exceed 1.6 pounds per million Btu heat input.

Liggett and Myers permit no. 2533R9)

Equipment:

2 No. 2 oil/natural gas-fired boilers (2.5 million Btu per hour maximum heat input each) under construction.

3 No. 6 oil-fired boilers (36.25 million Btu per hour maximum heat input each) in operation.

1 coal-fired boiler (111.8 million Btu per hour maximum heat input) in operation.

Limitations:

#4–The heat input of the three No. 6 oil-fired boilers (36.45 million Btu per hour each) and the coal-fired boiler (111.8 million Btu per hour) when fired separately or in combination shall not exceed a total of 111.8 million Btu per hour maximum heat input.

#5–the three No. 6 oil-fired boilers (36.25 million Btu per hour maximum heat input) and the coal-fired boiler (111.8 million Btu per hour maximum heat input) shall not be operated simultaneously.

#6–In no case shall:

- a. the total amount of coal-fired exceed 19,146 tons per calendar year,
- b. the coal sulfur content exceed one (1) percent by weight,
- c. the coal ash content exceed ten (10) percent by weight.

#8–Combustion emissions resulting from the operation of the coal-fired boiler shall not exceed the following tons per year (TPY) limitations:

- a. particulate 49.78 TPY
- b. sulfur dioxide 363.77 TPY
- c. nitrogen dioxide 143.60 TPY

Texasgulf Chemicals Company (permit no. 2971R6)

Equipment:

1 No. 6 fuel oil-fired F & W boiler in operation.

1 No. 2 fuel oil-fired B & W boiler in operation.

Limitations:

#3–Sulfur dioxide emissions from the No. 2 fuel oil-fired B & W boiler shall not exceed 0.30 pounds per million Btu heat input.

#4–The maximum heat input for the No. 2 fuel oil-fired B & W boiler shall not exceed 125 million Btu per hour.

#5–The sulfur content of the No. 2 fuel oil shall not exceed 0.3 percent by weight.

#6–The No. 2 fuel oil fired in the B & W boiler shall not exceed 7,821,428 gallons per calendar year. The B & W boiler is limited to a maximum annual sulfur dioxide emission rate of 166.60 tons and a maximum annual sulfuric acid mist emission rate of 6.45 tons.

#7–The maximum heat input capacity for the No. 6 fuel oil-fired F & W boiler shall not exceed 62.5 million Btu per hour unless one or more of the existing sulfuric acid plants (Nos. 2-6) are not in operation. The F & W boiler may be operated at a maximum heat input capacity of 125 million Btu per hour if one or more of the existing sulfuric acid plants (nos. 2-6) are not in operation.

#8–Sulfur dioxide emissions from the No. 6 fuel oil-fired F & W boiler shall not exceed 1.6 pounds per million Btu heat input.

#9–The sulfur content of the No. 6 fuel oil shall not exceed 1.5 percent by weight.

Texasgulf Chemicals Company (permit no. 4490R3)

Equipment:

1 fiberglass mist eliminator in operation.

2 absorption towers (at Sulfuric Acid Plant No.2-1525 tons per day maximum production rate) in operation.

Limitations:

#3–Sulfur dioxide emissions from Sulfuric Acid Plant No. 2 shall not exceed 4.0 pounds for each ton of sulfuric acid produced.

#4–Sulfuric acid mist emissions from Sulfuric Acid Plant No. 2 shall not exceed 0.5 pounds for each ton of sulfuric acid produced.

Texasgulf Chemicals Company (permit no. 2331R10)

Equipment:

6 phosphate rock calcining units

Limitations:

#2a–sulfur dioxide emissions from each phosphate rock calcining unit shall not exceed 0.75 pounds per million Btu.

#2b–the maximum heat input for each phosphate rock calcining unit shall not exceed 54.833 million Btu per hour.

Alba Waldensian P & W Plant (permit no. 4766)**Equipment:**

1 natural gas/ No. 5 oil-fired boiler (37.5 X 10⁶ Btu per hour maximum heat input) in operation.

1 coal-fired boiler (40 X 10⁶ Btu per hour maximum heat input) in operation.

Alba Waldensian John Louis Plant (permit no. 4920)**Equipment:**

2 natural gas/ No. 6 oil-fired boilers (17.0 and 14.7 million Btu per hour maximum heat input, respectively) in operation.

Valdese Manufacturing Company (permit no. 504R3)**Equipment:**

1 No. 6 oil/natural gas-fired boiler in operation.

2 coal boilers (60 million Btu per hour maximum heat input for all three boilers) in operation.

Burlington Industries (permit no. 4119R4)**Equipment:**

2 natural gas/ no. 6 oil-fired boilers (81.0 million Btu and 29 million Btu per hour maximum heat input, respectively) in operation.

PUBLIC HEARING JUNE 25, 1986-TRAVENOL LABORATORIES (PERMIT NO.1915R6)**Background:**

The permit for Travenol Laboratories in McDowell County was the only permit considered at this hearing. It limits the emissions of sulfur dioxide to 1.6 pounds per million Btu.

Equipment:

5 No. 6 oil-fired boilers (three with 29.9 million Btu per hour maximum heat input each, one with 52 million Btu per hour maximum heat input, and one with 69 million Btu per hour maximum heat input) in operation.

1 propane-fired afterburner (0.2 million Btu per hour minimum heat input) in operation.

Limitations:

#1-...in no case shall sulfur dioxide emissions from the fuel burning equipment exceed 1.6 pounds per million Btu input.

#3-The permit is issued with the stipulation that in no case shall the sulfur content of the No. 6 oil used in the new boiler 11 (69 million Btu per

hour maximum heat input) average in excess of 1.15% of weight, and the sulfur dioxide emissions are not to exceed 1.6 pounds per million Btu input under any circumstances.

#4-The permit is issued with the stipulation that in no case shall the usage of No. 6 oil in the new boiler (69 million Btu per hour heat input) exceed 2.75 million gallons per year.

PUBLIC HEARING JANUARY 20, 1987-CELANESE FIBERS OPERATIONS, ROWAN COUNTY (PERMIT NO. 3325R10)

Background:

The permit for Celanese Fibers Operations in Rowan County limits the emissions of sulfur dioxide to 1.6 pounds per million Btu.

Equipment:

5 No. 6 oil-fired boilers and 12 natural gas/No. 6 oil-fired oil heaters (maximum total heat input of 709 million Btu per hour) in operation.

1 natural gas-fired afterburner (0.4 million Btu per hour maximum heat input) in operation.

Limitations:

#4-This permit is issued with the stipulation that the maximum sulfur dioxide emissions rate from five No. 6 oil-fired boilers and twelve natural gas/No. 6 oil-fired oil heaters shall not exceed 1.6 pounds per million Btu heat input.

#5-This permit is issued with the stipulation that the maximum sulfur content in No. 6 fuel oil to be burned in the boilers and heaters at the facility shall not exceed 1.5 percent by weight.

PUBLIC HEARING MAY 19, 1989-HOECHST CELANESE CORPORATION (PERMIT NO. 3754R9)

Background:

The permit for Hoechst Celanese Corporation in Cleveland County limits the emissions of sulfur dioxide to 1.6 pounds per million Btu.

Equipment:

2 natural gas/No. 6 oil-fired boilers (ID Nos. 124 and 125, 57 million Btu per hour maximum heat input) under construction.

1 natural gas/No. 6 oil/ methanol-fired boiler (ID No. 126, 57 million Btu per hour maximum heat input) under construction.

3 afterburners (0.15 million Btu per hour maximum heat input each) under construction.

Limitations:

#2-Sulfur dioxide emissions from the fuel burning equipment shall not exceed 1.6 pounds per million Btu heat input.

PUBLIC HEARING AUGUST 4, 1989-CAPE INDUSTRIES (PERMIT NO. 130R11)

Background:

The permit for Cape Industries limits the operations of the boilers such that only two of the three boilers may be operated at any one time.

Equipment:

2 No. 6 oil-fired boilers (one with a 210 million Btu per hour maximum permitted heat input, one with a 246 million Btu per hour maximum permitted heat input).

1 No. 6 oil/sulfur free organic by-product fired boiler with a 246 million Btu per hour maximum permitted heat input.

3 No. 6 oil-fired hot oil heaters (one with a 160 million Btu per hour maximum permitted heat input, one with a 140 million Btu per hour maximum permitted heat input, and one with a 22 million Btu per hour maximum permitted heat input).

1 No. 6 oil/dimethyl ether/sulfur free organic by-product fired hot oil heater with a 167 million Btu per hour maximum permitted heat input.

1 No. 6 oil/sulfur free organic by-product fired hot oil heater with a 213 million Btu per hour maximum permitted heat input.

1 No. 6 oil-fired liquid waste incinerator with a 140 million Btu per hour maximum permitted heat input.

1 No. 6 fuel oil/dimethyl ether-fired water heater with a 167 million Btu per hour maximum permitted heat input.

Limitations:

#2-Sulfur dioxide emissions from the fuel burning equipment shall not exceed 2.3 pounds per million Btu heat input.

#5-The Permittee shall not operate more than two of the No. 6 oil-fired boilers, simultaneously.

SOURCES UNDER LOCAL AIR PROGRAM CONTROL:

AMERICAN ENKA (BUNCOMBE CO.)

DAYCO SOUTHERN (BUNCOMBE CO.)

CHAMPION INTERNATIONAL (HAYWOOD CO.)

R. J. REYNOLDS (FORSYTH CO.)*

*Thomas Allen to Assistant Chief for Permits, *et al.*, "Special Sulfur Dioxide Sources" 22 Oct. 1992 (memorandum).