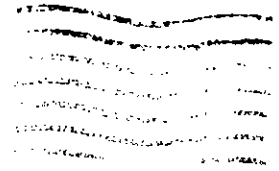


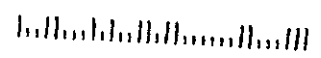
11/16/1987

**Ka** KOOGLER & ASSOCIATES, *Environmental Services*  
1213 NW 6th Street • Gainesville, Florida 32601 • 904/377-5822



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Mr. Pradeep Ravel  
Florida Department  
of Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, Florida 32301



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13-Nov-1987  
Gainesville, FL  
**KOOGLER & ASSOCIATES, Environmental Services**

1213 NW 6th Street • Gainesville, Florida 32601 • 904/377-5822

KA 102-86-04

November 13, 1987

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**BAQM**

Mr. John Brown  
Florida Department  
of Environmental Regulation  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Subject: Occidental Chemical Company  
Test Procedure for Determining Sulfur Dioxide and  
Sulfuric Acid Mist Emission Rates

Dear Mr. Brown:

During a visit to Tallahassee on October 20, 1987, I had the opportunity to talk with you and Pradeep Ravel regarding possible amendments to the air permits for the Occidental sulfuric acid plants. The amendments we discussed would specifically state the procedure that is to be used to calculate sulfur dioxide and sulfuric acid mist emission rates from the plants. This discussion was prompted by my review of permits that were recently issued to modify the operating conditions of the "C" and "D" sulfuric acid plants (Permits AC24-131270 and AC24-131271) at Occidental's Suwannee River Chemical Complex.

The referenced permits for the "C" and "D" sulfuric acid plants state in part (Specific Condition No. 7):

A compliance test shall be carried out in accordance with 40CFR60, Subpart H. ...

In reviewing the test methods and procedures of 40CFR60, Subpart H, (Section 60.85), I confirmed that Occidental has, in the past, complied with the compliance test requirements of Sections 60.85(a)(1) and (4) and of Section 60.85(e) and can reasonably continue to comply with these requirements. The test methods and procedures set forth in these sections specify procedures for determining the pounds of sulfur dioxide (SO<sub>2</sub>) and sulfuric acid mist emitted to the atmosphere per ton of 100 percent acid produced.

Basically, the method that Occidental uses, and a method set forth in Section 60.85(e), involves the use of EPA Method 8 to measure the concentration of SO<sub>2</sub> and acid mist in a cubic foot of stack gas, the use of EPA Method 3 to determine the oxygen content of the stack gas and the use of an "S" factor to calculate the pounds of SO<sub>2</sub> and acid mist emitted per ton of acid produced. The "S" factor referenced in this method is described in 40CFR60.84(d) and is the number of cubic feet of stack gas generated per ton of 100 percent sulfuric acid produced. Occidental was instrumental in having the "S" factor procedure incorporated into 40CFR60, Subpart H, as I will discuss later.

As stated in the preceding paragraph, the test methods and procedures of 40CFR60, Subpart H, which Occidental has and will continue to comply with, set forth the procedures for calculating the pounds of SO<sub>2</sub> and sulfuric acid mist per ton of acid produced. In addition to this emission limit, however, the permits issued by the Florida Department of Environmental Regulation (FDER) also limit the hourly mass emission rate of both SO<sub>2</sub> and sulfuric acid mist (i.e., the permits limit the pounds of SO<sub>2</sub> and acid mist that can be emitted into the atmosphere each hour). This is a requirement that is beyond the requirements of 40CFR60, Subpart H.

To demonstrate compliance with this state-imposed mass emission limit, Occidental, in accordance with correspondence to the Northeast District office of FDER, dated April 2, 1981, has multiplied the pounds of SO<sub>2</sub> and sulfuric acid mist emitted per ton of acid by the hourly average sulfuric acid production rate over the test period. The sulfuric acid production rates have been determined by acid flow totalizers which have been cross-checked against tank strappings, steam production rates and long-term sulfur consumption records. The acid production rates determined by the totalizers have also been included in the compliance test reports to document the sulfuric acid production rates at the time of a compliance test. The Department has accepted the acid production rates determined by the totalizers, based upon descriptions and information on these measuring devices provided by Occidental at the Department's request.

Based on the fact that the pounds of SO<sub>2</sub> and acid mist emitted per ton of acid have been determined in accordance with requirements of 40CFR60.85 and the fact that the acid production rates during the test period have been determined by a method found acceptable by the Department, it follows that the determination of the mass emission rates of SO<sub>2</sub> and acid mist (pounds per hour) based on these two factors should also be acceptable to the Department. During our discussion on October 20, 1987, and based upon previous discussions we've had of this matter, I believe you stated that you had no objection to calculating the mass emission rates of SO<sub>2</sub> and acid mist using the procedure that Occidental has used for the past six years; i.e., the procedure outlined above.

The other procedure for calculating the mass emission rate of SO<sub>2</sub> and acid mist (pounds per hour) is to multiply the SO<sub>2</sub> and acid mist concentrations as determined by EPA Method 8 (pounds per cubic foot) by the hourly stack gas flow rate (cubic feet per hour). The SO<sub>2</sub> and acid mist mass emission rates determined by this procedure should equal the mass emission rates determined by the procedure outlined in the previous paragraphs if the stack gas flow rate is accurately measured.

Regarding the stack gas flow rate measurements, Occidental has never been convinced that the stack gas flow rates from their sulfuric acid plants could be measured without significant error. During the period 1980-1981, Occidental spent considerable time and effort measuring stack gas flow rates from sulfuric acid plants and comparing these flow rates with the stack gas flow rate calculated from a mass balance across the plant. The measured stack gas flow rates were also compared with flow rates expected from the sulfuric acid plant turbine blowers. In virtually all cases, the measured stack gas flow rates were higher than the flow rates determined by the mass balance and the flow rates determined from the turbine blower performance curves. As a result, Occidental began relying exclusively on the use of the "S" factor for determining the pounds of SO<sub>2</sub> and sulfuric acid mist emitted per ton of acid produced and the product of the unit SO<sub>2</sub> and acid mist emission rates (pounds per ton) and the sulfuric acid production rate (tons per hour) to determine the mass emission rate (pounds per hour) of both SO<sub>2</sub> and acid mist.

To codify the procedures that Occidental found to be most accurate for calculating emissions from their sulfuric acid plants, Occidental visited EPA on September 17, 1981 and discussed the "S" factor with Mr. Peter Westlin. On October 8, 1981, Occidental wrote to EPA and requested a formal recognition of the procedures. A copy of Occidental's letter to EPA and the attachments to that letter describing the "S" factor are attached hereto. Also attached are EPA's responses to Occidental's letter. As a result of this effort on the part of Occidental, the "S" factor method was incorporated into 40CFR60, Subpart H in 1983.

The attachments to Occidental's letter to EPA dated October 8, 1981, have been transmitted to the Department and have been discussed with you and/or other members of the Department's staff on several occasions. The information is attached hereto to provide you with a ready reference to the material.

Also, as I have stated in a previous paragraph, Occidental has discussed methods for determining the sulfuric acid production rate with the Department (see letter dated April 2, 1981). As a result of these discussions and other information provided by Occidental, it was mutually agreed to use the sulfuric acid plant totalizers as an accurate method of determining the sulfuric acid production rate during compliance test periods.

Mr. John Brown  
FDER, Tallahassee

November 13, 1987  
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By this letter, Occidental is requesting that the product of the SO<sub>2</sub> and sulfuric acid mist emissions (pounds per ton), as determined by 40CFR60.85, and the sulfuric acid production rate (tons per hour), determined by a method approved by the Department (the flow totalizers), be incorporated by amendment into the permits for the Occidental sulfuric acid plants as the procedure for determining the mass emission rates (pounds per hour) of SO<sub>2</sub> and sulfuric acid mist. Although the review of the permits for Occidental's "C" and "D" sulfuric acid plants (AC24-131270 and AC24-131271) prompted my discussion with you and this request, Occidental would also like to have the permits for the "A" and "B" sulfuric acid plants at the Suwannee River Chemical Complex (A024-103966 and A024-103964) and the permits for the "E" and "F" sulfuric acid plants at the Swift Creek Chemical Complex (A024-090784 and A024-090785) amended to specify the procedure described herein for calculating the mass emission rate (pounds per hour) of SO<sub>2</sub> and sulfuric acid mist.

In discussing this request with you, you stated that you would have your staff review Occidental's request once it was submitted and would also possibly discuss the matter with EPA. Occidental's contact with EPA in 1981 was Mr. Peter Westlin of the Emission Measurement Branch, Emission Standards and Engineering Division, USEPA, Research Triangle Park, North Carolina. I recently contacted Mr. Westlin at (919) 541-2237 and he indicated that he would be more than happy to discuss this matter with you or your staff.

I appreciate your review and consideration of this request and will be happy to provide any additional information that you may require to complete your review of this matter.

Very truly yours,

KOOGLER & ASSOCIATES

  
John B. Koogler, Ph.D., P.E.

JBK:mab

cc: Mr. Peter Westlin, EPA, Research Triangle Park, N.C.  
✓ Mr. Pradeep Ravel, FDER, Tallahassee  
Mr. Marvin Miller, Occidental Chemical Company

Copied: Pradeep Ravel }  
CHF/BT } 11/18/87 (m)