



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

March 6, 2001

Office of
AIR AND RADIATION

John M. Irving, P.E.
Designated Representative
McNeil Wood-Fired Generating Station
585 Pine Street
Burlington, VT 05401-489

Re: McNeil Generating Station Sulfur Dioxide Monitoring Petition

Dear Mr. Irving:

EPA has received your November 22, 1999 petition under 40 CFR 75.66(a) for alternative monitoring and reporting requirements for the Burlington Electric Department's (Burlington) McNeil Generating Station (McNeil). In that petition, Burlington requests approval for an alternative requirements to the applicable monitoring and reporting procedures for sulfur dioxide emissions under 40 CFR part 75.

Background

McNeil is subject to the Acid Rain Program under title IV of the Clean Air Act and to the Ozone Transport Commission NO_x Budget Program. The unit burns primarily virgin wood, but also burns pipeline natural gas and #2 fuel oil. In accordance with 40 CFR 75.10(a)(1), (2), and (3), the unit currently operates and maintains continuous emissions monitoring systems (CEMS) to determine sulfur dioxide, nitrogen oxides, and carbon dioxide emissions.

As stated in the petition, sulfur dioxide emissions from McNeil are about 1 to 4 tons annually. Burlington states that the pipeline natural gas and wood typically fired at the McNeil result in hourly average sulfur dioxide concentrations of less than 2 ppm and that both fuels qualify as "very low sulfur fuels" under 40 CFR 72.2, with the wood having a sulfur content of 0% by weight. Under 40 CFR 75.11(e)(3)(iii), hourly average sulfur dioxide concentrations recorded by a CEMS must be adjusted to report a default value of 2 ppm for any hour when very low sulfur fuel is combusted and the CEMS records an hourly average sulfur dioxide

concentration of less than 2 ppm. Consequently, Burlington reports the 2 ppm default value for each hour that McNeil burns pipeline natural gas or wood, which is almost every operating hour of the unit.

Although McNeil also burns #2 fuel oil, this occurs infrequently, such as for start ups during winter months when pipeline natural gas is not available. According to the petition, the unit's operating permit limits the sulfur content of any fuel oil burned at McNeil to 0.3% by weight and the firing rate for fuel oil is physically limited to 27 gpm or about 35% of gross load by the design of the unit. The #2 fuel oil does not qualify as very low sulfur fuel. However, CEMS data for 1997-99 submitted on January 1, 2000 and CEMS data for 2000 show that the emissions of sulfur dioxide are usually 0 ppm, and do not exceed 0.5 ppm, when #2 fuel oil is co-fired with the other fuels at the unit. Consequently, Burlington reports less than 2 ppm for every hour that #2 fuel oil is burned.

As noted above, Burlington operates and maintains a CEMS to account for sulfur dioxide emissions at McNeil. According to the petition, this requirement is "extremely burdensome" since the unit has low sulfur dioxide emissions and always reports for sulfur dioxide emissions either hourly default values of 2 ppm or monitored values of less than 2 ppm. The petition requests that Burlington be allowed to discontinue operating and maintaining a sulfur dioxide CEMS at the unit and that Burlington instead either report each quarter a prorated amount of annual sulfur dioxide emissions of 16 tons for the unit or use for each hour a default value for sulfur dioxide emissions of 2 ppm, regardless of the fuel burned.

EPA's Determinations

EPA agrees that it is unnecessarily burdensome to operate and maintain the sulfur dioxide concentration monitor as part of the sulfur dioxide CEMS at McNeil since this results in Burlington reporting a default value (rather than any monitored value) for virtually every unit operating hour, even though the CEMS is not out-of-control. Further, for the few hours for which monitored data are reported, reported sulfur dioxide emissions are extremely low, significantly less than 2 ppm. Under these circumstances, there seems to be little purpose in using a sulfur dioxide concentration monitor. EPA also notes that, under 40 CFR part 75, if McNeil burned only pipeline natural gas and #2 fuel oil and no wood, the unit would not be required to use a sulfur dioxide concentration monitor. See 40 CFR part 75, appendix D, sections 2.3.1.1 through 2.3.1.3 (pipeline natural gas combustion) and sections 3.1 and 3.2 (oil combustion) (allowing gas-fired or oil-fired units to monitor sulfur dioxide emissions without using a sulfur dioxide concentration monitor or stack flow monitor). Since the wood that McNeil burns has little or no sulfur content, that further supports using an approach for McNeil that, like that for gas- or oil-fired units, does not require a sulfur dioxide concentration monitor. However, a stack flow monitor is still necessary in order to determine the heat input from the wood that is combusted.

Therefore, EPA grants the petition in part and, as discussed below, approves certain alternative monitoring and reporting requirements. With the following conditions, Burlington may discontinue operating and maintaining a sulfur dioxide concentration monitor at McNeil.

First, instead of using a sulfur dioxide concentration monitor, Burlington must calculate a custom default sulfur dioxide emission rate for each year and apply that rate in Equation F-23 of 40 CFR part 75, appendix F, section 7 in order to account for sulfur dioxide emissions when burning wood, gas, or oil or a combination of these fuels at McNeil. Specifically, Burlington must calculate a custom default emission rate by using the following equations.

$$E = \sum_{i=1}^3 E_i / 3$$

$$E_i = (\% t_{ig\&w}) (0.0006 \text{ lb/mmBtu}) + (\% t_{ioil})(E_{ioil})$$

$$E_{ioil} = (20000) (\% S_i) / GCV_i$$

Where:

- E = Custom default sulfur dioxide emission rate, lb/mmBtu.
- E_i = Sulfur dioxide emission rate for year i, lb/mmBtu
- i = Each year in the 3-year period immediately preceding the year for which E is being calculated.
- E_{ioil} = Sulfur dioxide emission rate of oil delivered in year i, lb/mmBtu.
- % t_{ig&w} = Percent of total operating hours when gas or wood is combusted in year i.
- % t_{ioil} = Percent of total operating hours when oil is combusted in year i.
- % S_i = Annual average percent sulfur, by weight, of oil delivered in year i.
- GCV_i = Annual average gross calorific value of oil delivered in year i, Btu/lb.

The custom default emission rate for 2001 is 0.0033 lb/mmBtu, calculated using the operating data and oil sampling data provided for 1998, 1999 and 2000 and these equations.

After the end of each year, Burlington must recalculate the new custom default value, which is a 3-year rolling average value. Each year the calculation must include the percentages of total operating hours when gas, wood, or oil is combusted and oil sampling data (i.e., average percent sulfur and gross calorific value based on the sampling data for each delivery of oil) for that year and the two immediately preceding years. This information must be retained on site in a format suitable for inspection. The 3-year rolling average is used because, given that McNeil burns relatively small amounts of oil each year, a default value based on three years of historical data will be more representative than one based only on one year.

After recalculating the custom default value after the end of each year, Burlington must report the new value in record type 531 of the quarterly Electronic Data Report, and apply the new value, starting January 1 of the next year. Burlington must use the custom default emission rate for the year as the term “ER” (in lieu of the default emission rate from section 2.3.1.1 or 2.3.2.1.1 of appendix D) in Equation F-23 in order to determine hourly sulfur dioxide mass emissions. The sum of sulfur dioxide mass emissions for each hour in the year equals the sulfur dioxide mass emissions for that year. As provided in Equation F-23, Burlington must determine hourly heat input using the procedures in section 5.2 of appendix F, which require use of a stack flow monitor, a diluent monitor, and a moisture monitor.

Second, starting with the second quarterly report for 2001, Burlington must report for each quarter sulfur dioxide mass emissions using values determined as described above. In the quarterly reports, Burlington should modify the monitoring plan as follows: delete the sulfur dioxide CEMS status information in record type 510; delete the sulfur dioxide CEMS formulas in record type 520 and replace them with Equation F-23 (as modified above to use the custom default sulfur dioxide emission rate); delete the sulfur dioxide span information in record type 530; and delete the reference to the sulfur dioxide CEMS monitoring in record type 585 and replace it with a reference to use of a default emission rate.

Finally, Burlington must continue to monitor nitrogen oxide and carbon dioxide emissions at McNeil in accordance with 40 CFR 75.10(a)(2) and (3) and report such emissions in accordance with 40 CFR part 75.

If you have any questions about these matters, please contact Theresa Alexander of my staff, at (202) 564-9747 or alexander.theresa@epa.gov. Thank you for your continued cooperation.

Sincerely,

/s/

Brian J. McLean
Director, Clean Air Markets Division

cc: Ian Cohen, EPA Region 1
Richard Valentinetti, Director, VAPCD
Theresa Alexander, Clean Air Markets Division