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November 28, 1994

Department of Environmental Protection
Chief Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, FL 32399

Attn: Mr. Claire Fancy

Subject: Ridge Generating Station
Air Construction Permit #AC53-206244/PSD-FL-813

Dear Sir:

This letter is written at the request of Bruce Mitchell of your office as a result of telephone discussions held between Mr. Mitchell and Bob Soich of the Department's S. W. District, and between Mr. Soich and Gary Aguinaga of this facility. It concerns the ambient ammonia monitor required by Specific Condition #6 of the subject permit. The permit requires ambient ammonia to be continuously measured and data collected at the property fenceline during the first year of facility operation. The Comprehensive Emissions Test report, due within 15 months of initial start-up of the facility, was to include a discussion of the data collected and a recommendation to the Department on whether or not ambient ammonia monitoring should be continued.

Despite continued efforts, the facility has been unable to measure ambient ammonia successfully. The system installed has repeatedly failed and provided inaccurate data due to high humidity in the ambient air sample.

The ambient ammonia monitoring system installed is a TECO Model 17 chemiluminescence ammonia analyzer with converting data logger and chart recorder. The system was set up to measure ambient ammonia in the 0-10 ppb and 0-5000 ppb ranges. The system also consists of a Model 145 permeation calibrator to generate known quantities of NH_3 for calibration of the instrument. The principle of measurement is to measure NO, NO_2, and NH_3 in the sample, using catalytic reduction with selective absorption/conversion procedure [$(NO_x + NH_3) - NO_x = NH_3$]. A pump supplies sample to the system. Particulate is removed by a 1 micron filter located at the sample inlet. The entire system is housed in a climate-controlled shelter to maintain 68°F-72°F, which is necessary for instrument measurement stability.

The system was assembled and tested at the factory prior to shipment. This testing, however, could not include high humidity ambient air due to the vender factory location. Once the system had operated in the field, it became apparent that the high humidity ambient air in Florida was creating problems due to the condensation of water vapor in the system. Since any condensed moisture will scrub ammonia prior to measurement during both calibration and measurement periods, if ambient ammonia was present in the air, it would not be measured by the system accurately. In addition, the moisture was continually damaging the internals of the analyzer.

Altech, the ammonia monitor supplier, worked extensively on site to resolve the problems using numerous approaches. A water condenser system was installed to remove water vapor without scrubbing ammonia. The sample line was heated to prevent condensation. Finally, on the advice of the instrument manufacturer, TECO, the entire analyzer was sent back to TECO for overhaul and re-calibration. None of these measures were successful. Discussions with TECO and with other manufacturers of similar instruments have indicated that measurement of ambient ammonia using best available technology in a humid environment at such low concentrations is very difficult. Currently, we know of no ambient ammonia systems successfully operating in this area and conclude that we will not be able to measure ambient ammonia at the facility until current technology is refined or new technology is developed.

It should be noted that we have been complying with ammonia monitoring requirements by taking daily measurements for ambient ammonia using a Sensidyne hand pump system. This system is capable of detecting ammonia at concentrations as low as .5 ppm. No ammonia has been detected using this method.

As alternatives to continuously monitoring for ambient ammonia during the initial year of facility operation, the facility recommends that surrogate methods be used to evaluate the need for future monitoring. The first method is to use the ammonia slip data collected during each of the quarterly stack emission tests and PSD monitoring results to predict ambient ammonia. The second surrogate method is already in place. The facility's selective non-catalytic reduction (SNCR) system to control boiler NO_x emissions is fully automated and closely controls the amount of urea injected into the furnace to prevent excessive over-feeding, which minimizes ammonia slip. In addition, the system was carefully optimized during facility start-up operations so that urea is injected from ideal furnace injection points and at ideal flow combinations to maximize system effectiveness and to achieve efficient reagent mixing without over-feeding. The plant's distributed control system monitors, controls, and records urea injection rates, furnace temperatures, NO_x emissions and other process parameters required to ensure proper system operation.

Based on the above, Ridge Generating Station requests your approval of using the surrogate methods described herein to evaluate the need for ambient ammonia monitoring beyond the initial year of facility operation, in lieu of recording data

with the non-functional monitor presently located at the facility. If approved, the Comprehensive Emissions Test report to be submitted in June, 1995 will contain a discussion that contains conclusions drawn from analyzing all available data, as well as a recommendation to the Department on whether the need still exists for continued ambient ammonia monitoring at the facility.

Please do not hesitate to call Gary Aguinaga at (813) 665-2255 if you have any questions regarding this submittal. We would be happy to meet with the Department to discuss this matter further.

Sincerely,

Rodney Williams

Rodney Williams
Plant Manager

cc: G. Aguinaga
B. Soich (DEP, Tampa)
F. Ferraro
T. Porter
J. Goodwin
M. Killeen
J. Rogers

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