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Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

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JAN 25 2008

BUREAU OF AIR REGULATION

Attention: Mr. Jeff Koerner, Air Permitting South

**RE: UNITED STATES SUGAR CORPORATION, CLEWISTON MILL
BOILER NO. 8 PERMIT NO. 0510003-030-AC/PSD-FL-333B
AMMONIA SLIP COMPLIANCE RETEST**

Dear Mr. Koerner:

United States Sugar Corporation (U.S. Sugar) performed their annual compliance test on Boiler No. 8 on November 29 through 30, 2007. Testing was completed for particulate matter (PM), sulfur dioxide (SO₂), nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), and ammonia slip. A Relative Accuracy Test Audit (RATA) was also performed as part of this compliance test. All of the pollutants measured in the stack were in compliance with permitted rates except for ammonia slip. The current permit (Permit No. 0510003-037-AC/PSD-FL-33C) limits ammonia slip from the stack to 20 parts per million (ppm) at 7-percent oxygen (O₂). The three run average for the ammonia slip tests resulted in an ammonia slip of 22 ppm at 7 percent O₂. This permit exceedance was due to an abnormally high ammonia slip of 34 ppm during the first compliance test run.

The high ammonia slip during the first run is believed to be due to a short period of time (minutes) during which the NO_x levels in the boiler rapidly decreased causing the urea injection system to rapidly reduce the urea injection rate. The urea injection system was designed to increase the urea injection rate as the NO_x emissions increased in order to facilitate the reaction of NO_x and ammonia (NH₃) to nitrogen, oxygen, and water. However, when NO_x emissions rapidly decrease, or are abnormally low, there may not be sufficient NO_x available in the system to react with the urea, and this causes the ammonia slip to increase.

During the first ammonia slip run, NO_x emissions from the stack were measured at 0.109 pound per million British thermal units (lb/MMBtu), well below the permit limit of 0.14 lb/MMBtu, and the average amount of urea injected per minute was 38 gallons. The average ammonia slip was 34.46 ppm at 7 percent O₂. The run began under normal operating conditions, with NO_x emissions at 0.132-0.15 lb/MMBtu and urea injection rates of 45-55 gal/hr. However, about 10 minutes into the run, the NO_x levels abruptly dropped to as low as 0.06 lb/MMBtu. This would typically indicate a boiler upset condition (for example, unusually wet bagasse being fed to the boiler). Based on the continuous emissions monitoring system (CEMS) data, the urea injection system attempted to compensate for this rapid change by reducing the urea injection to as low as 27 gal/hr (see Appendix E of the test report for complete CEMS data). NO_x levels remained relatively low (0.10 to 0.14 lb/MMBtu) during the remainder of the run, as did the urea injection rate (35-40 gal/hr).

The ammonia slip measured during the second run was much lower at 13.04 ppm at 7-percent O₂. As the NO_x emissions began to rise, as can be seen in the second run, the amount of urea injected was also increased. A similar result was experienced with the third run, which had even higher NO_x emissions and urea injection, but the ammonia slip was measured at 18.99 ppm at 7-percent O₂.

Even though the ammonia slip for the first run was greater than allowed in the permit, the NO_x emissions were well within compliance. Therefore, it is suggested that the large ammonia slip was caused by a boiler upset condition and a low amount of NO_x available to react with the urea.

U.S. Sugar is planning to discuss the situation with Fuel Tech, Inc., the manufacturer of the urea injection system, during their next quarterly visit to further investigate the causes of the high ammonia slip, as well as available measures to correct the problem. U.S. Sugar is planning to perform a 3-run retest for ammonia slip on Boiler No. 8, which is tentatively scheduled for the last week in January 2008.

If you have any questions about this information, please do not hesitate to call me at (352) 336-5600.

Sincerely,

GOLDER ASSOCIATES INC.



David A. Buff, P.E., Q.E.P.
Principal Engineer



E. Claire Booth, E.I.
Staff Engineer

cc: A. Satyal, FDEP South District
K. Tingberg, U.S. Sugar
B. Nesbitt, U.S. Sugar

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