**Golder Associates Inc.**

6241 NW 23rd Street, Suite 500
Gainesville, FL USA 32653
Telephone (352) 336-5600
Fax (352) 336-6603
www.golder.com



March 7, 2007

063-7603

Florida Department of Environmental Protection
Department of Air Resources Management
2295 Victoria Avenue, Suite 364
Fort Myers, Florida 33901-3881

Attention: Mr. Ron Blackburn, Environmental Administrator

**RE: UNITED STATES SUGAR CORPORATION – CLEWISTON MILL**
**BOILER NO. 8 – MACT PERFORMANCE TESTING**
**40 CFR PART 63, SUBPART DDDDD**
**PERMIT NO. 0510003-030-AC/PSD-FL-333B**

Dear Mr. Blackburn:

On January 5, 2007, United States Sugar Corporation (U.S. Sugar) conducted a performance test on Boiler No. 8 to satisfy the requirements of Title 40, Part 63 of the Code of Federal Regulations (40 CFR 63), Subpart DDDDD, the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial and Institutional Boilers and Process Heaters [Boiler Maximum Available Control Technology (MACT) rule]. The purpose of the testing was to assess Boiler MACT compliance and potentially re-establish operating parameter limits for crop-season operation.

Additionally, this test represents the third consecutive annual performance test showing compliance with the Boiler MACT hydrogen chloride (HCl) emission limit and the fourth consecutive annual performance test showing compliance with the Boiler MACT particulate matter (PM) emission limit, both while burning bagasse. According to 40 CFR 63.7515(b), performance tests may be conducted less frequently if the performance tests for at least three consecutive years show compliance with the emissions limit.

The first three HCl performance tests for Boiler No. 8 while burning bagasse were conducted March 24 through March 25, 2005; June 2, 2006; and January 5, 2007. A summary of the test results is presented in Table 1. Each test demonstrated compliance with the 0.02 pound per million British thermal unit (lb/MMBtu) HCl limit. Because compliance was demonstrated in three consecutive annual tests according to §63.7515(b), the next HCl performance test when burning bagasse does not have to be conducted for the next 2 years, but must be conducted during the third year. As long as the subsequent performance tests show continuous compliance with the emissions limit, tests must be conducted no more than 36 months after the previous performance test. Therefore, the next HCl performance test on bagasse will be conducted in late 2009. It is acknowledged that additional performance tests may be required for Boiler No. 8 while burning wood chips.

The first five PM performance tests for Boiler No. 8 while burning bagasse or wood chips were conducted March 24 through March 25, 2005; January 10, 2006; June 2, 2006; August 22, 2006; and January 5, 2007 (see Table 1). Each test demonstrated compliance with the 0.025 lb/MMBtu PM

limit. For PM, it is recognized that the Boiler No. 8 PSD permit requires annual testing. However, for the next two annual tests, this will be a state-only compliance test (i.e., not a MACT performance test).

Only one HCl performance test for Boiler No. 8 while burning wood chips has been completed. This test was conducted on August 22, 2006. Compliance with the 0.02 lb/MMBtu HCl limit was not demonstrated with this test, which was based on sampling at the inlet to the wet cyclones

The summary of the complete test results of the January 5, 2007, performance test is presented in Table 2. The stack sampling and fuel sampling and analysis were conducted according to the protocol submitted to the Florida Department of Environmental Protection (FDEP) in a letter dated December 1, 2006, from Golder Associates Inc. A discussion of the test results follows below.

**Boiler No. 8 Operation**
During the official performance testing of January 5, 2007, the boiler averaged approximately 510,270 pounds per hour (lb/hr) of steam, which was approximately 93 percent of the maximum 1-hour steam production limit of 550,000 lb/hr, and was 102 percent of the maximum 24-hour steam production limit of 500,000 lb/hr.

Fuel analysis was performed on bagasse, which was the only fuel burned during the performance test. The F-Factor values averaged approximately 10,850 dry standard cubic feet per million British thermal units (dscf/MMBtu). The heat input rate, based on the F-Factor, averaged approximately 820 million British thermal units per hour (MMBtu/hr), which was approximately 80 percent of the maximum 1-hour heat input limit of 1,030 MMBtu/hr, and was 88 percent of the maximum 24-hour heat input limit of 936 MMBtu/hr. Boiler oxygen ($O_2$) levels were approximately 8.5 percent, based on stack data.

**Particulate Matter Test Results**
The PM emissions from Boiler No. 8 averaged 0.011 lb/MMBtu during the performance test runs on January 5, 2007, based on the F-Factor method of determining heat input to the boiler. The result is below the Boiler MACT limit of 0.025 lb/MMBtu.

It is noted that these runs were also conducted while monitoring electrostatic precipitator (ESP) power input and wet cyclone scrubber water flow rate in order to establish minimum crop season operating limits for these parameters as required by the MACT regulations.

**Nitrogen Oxides Test Results**
There is no permit limit based on stack testing for nitrogen oxides ($NO_x$), since compliance is demonstrated with the continuous emission monitoring system (CEMS) for $NO_x$. During the MACT performance tests, $NO_x$ emissions from the CEMS averaged 0.14 lb/MMBtu. The permit limit for $NO_x$ based on the CEMS is 0.14 lb/MMBtu, based on a 30-day rolling average.

**Carbon Monoxide Test Results**
There is no permit limit based on stack testing for carbon monoxide (CO), since compliance is demonstrated with the CEMS for CO. During the performance tests, CO emissions from the CEMS averaged 428 parts per million on a volumetric, dry basis (ppmvd) at 7 percent $O_2$. The permit limit for CO based on the CEMS is 400 ppmvd at 7 percent $O_2$, based on a 30-day rolling average.

**Sulfur Dioxide Test Results**
Sulfur dioxide ($SO_2$) emissions from Boiler No. 8 were not tested as part of the January 5, 2007, testing since there are no Boiler MACT limits for $SO_2$.

**Volatile Organic Compound Test Results**
Volatile organic compound (VOC) emissions from Boiler No. 8 were not tested as part of the January 5, 2007, testing since there are no Boiler MACT limits for VOCs.

**Ammonia Slip Test Results**
Ammonia slip from Boiler No. 8 was not tested as part of the January 5, 2007, testing since there are no Boiler MACT limits for ammonia slip.

**Hydrogen Chloride Test Results**
Emissions of HCl and chlorine ($Cl_2$) from Boiler No. 8 were tested at the inlet to the wet cyclone scrubbers. During the official MACT performance testing, HCl emissions from Boiler No. 8 averaged 0.0023 lb/MMBtu and $Cl_2$ emissions averaged 0.0028 lb/MMBtu. The HCl emissions, which were tested before the wet cyclone scrubbers and ESP, are less than the Boiler MACT limit of 0.02 lb/MMBtu for HCl at the stack. This test demonstrates that the wet cyclone scrubbers are not necessary for compliance with the MACT standard for HCl.

**Control Device Operating Limits**
The MACT regulations require that operating limits for the control devices be set during the MACT performance testing. The operating limits are set based on 90 percent of the minimum test run that demonstrated compliance. The MACT rules regulate PM emissions. For PM, the control device is the ESP. However, the U.S. Environmental Protection Agency (EPA) has also declared (in a letter dated September 20, 2005) that the wet cyclone scrubbers are also PM control devices and, therefore, water flow rate must be monitored for these control devices. In a letter dated September 1, 2006, the EPA approved cessation of continuous monitoring of the pressure drop across both wet cyclone scrubbers.

During the January 5, 2007, testing, the ESP was operating with three ESP fields in operation (i.e., two fields were shut down) for all three test runs. Compliance with the MACT PM limit of 0.025 lb/MMBtu was demonstrated for each run. Total ESP power input averaged 32 kilowatts (kW), with the minimum test run averaging 29 kW. Although 90 percent of the minimum test run value is 26 kW, the minimum operating limit remains at 25 kW, which was established in the January 2006 crop season testing.

During the performance test runs, the wet cyclone scrubbers demonstrated the following control device parameters, which reestablish the minimum water flow rate operating limits for the crop season:

- Scrubber 1- Water flow rate – Average = 21,761 gallons per hour (gal/hr)
  – Minimum = 12,001 gal/hr
  – Operating limit at 90 percent of min. = 10,801 gal/hr

- Scrubber 2- Water flow rate – Average = 22,000 gal/hr
  – Minimum = 12,000 gal/hr
  – Operating limit at 90 percent of min. = 10,800 gal/hr

**Visible Emissions**
Visible emission (VE) observations were recorded for Boiler No. 8 during the third run of the January 5, 2007, performance test. The average opacity for the highest period was 1.5 percent as compared to a permit limit of 10 percent.

**Fuel Sampling and Analysis**
Stack sampling and fuel sampling and analysis were conducted according to the protocol submitted to FDEP in a letter dated December 1, 2006. The bagasse fuel analysis results are presented in Table 3.

**Mercury in Fuel**
Mercury was measured in the fuel to demonstrate compliance with the Boiler MACT limit of $3x10^{-6}$ lb/MMBtu. Based on the fuel analysis, mercury averaged $1.7x10^{-6}$ lb/MMBtu and the 90th percentile was $3x10^{-6}$ lb/MMBtu. U.S. Sugar will continue to meet the mercury Boiler MACT limit through fuel analysis.

**Chlorine in Fuel**
$Cl_2$ emissions were also measured in the fuel and compared to the Boiler MACT limit. $Cl_2$ in the fuel averaged 0.033 lb/MMBtu and the 90th percentile is 0.05 lb/MMBtu. This is higher than the Boiler MACT limit of 0.02 lb/MMBtu, which is why U.S. Sugar is meeting the $Cl_2$ limit through stack sampling.

Please call me at (352) 336-5600 or e-mail me at dbuff@golder.com if you have any questions concerning this information.

Sincerely,

GOLDER ASSOCIATES INC.

David A. Buff

David A. Buff, P.E., Q.E.P.
Principal Engineer
Florida P.E. #19011
SEAL

Claire Booth

Elizabeth Claire Booth, E.I.
Staff Engineer

ECB/DB/all

Enclosures

cc: Don Griffin
Peter Briggs
Jeff Koerner, FDEP Tallahassee

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## TABLE 1
## SUMMARY OF PAST ANNUAL PM AND HCL COMPLIANCE TEST RESULTS FOR BOILER NO. 8, U.S. SUGAR CLEWISTON

| Parameter | Source of Data | March 24-25, 2005 | January 10, 2006 | June 2, 2006 [a] | August 22, 2006[a] | January 5, 2007 | Permit or Subpart DDDDD Limit |
|---|---|---|---|---|---|---|---|
| Fuel Type | | Bagasse | Bagasse | Bagasse | Wood Chips | Bagasse | |
| F-Factor (dscf/MMBtu) | Fuel Analysis | 9,900 | 10,794 [b] | 9,930 | 11,223 | 10,850 | -- |
| Steam Production (lb/hr) | Stack Test | 500,915 | 518,436 | 225,545 | 201,312 | 510,270 | **550,000** |
| Heat Input from F-Factor (MMBtu/hr) | Stack Test | 927 | 916 | 485 | 400 | 820 | **1,030** |
| Stack Flow (dscfm) | Stack Test | 224,665 | 214,068 | 146,016 | 148,148 | 217,072 | -- |
| Oxygen (%) - dry basis | Stack Test | 6.7 | 4.8 | 9.4 | 10.4 | 8.5 | -- |
| **Emissions based on the F-Factor** | | | | | | | |
| Particulate Matter (lb/MMBtu) | Stack Test | 0.004 | 0.022 | 0.002 | 0.015 | 0.011 | **0.025** |
| Chlorine (inlet) (lb/MMBtu) [c] | Stack Test | N/A | N/A | 0.0004 | 0.0027 | 0.0028 | **N/A** |
| Hydrogen Chloride (inlet) (lb/MMBtu) [c] | Stack Test | N/A | N/A | 0.0054 | 0.0854 | 0.0023 | **N/A** |
| Hydrogen Chloride (outlet) (lb/MMBtu) [c] | Stack Test | 0.0039 | N/A | N/A [d] | N/A [d] | N/A [d] | **0.02** |

[a] Test was conducted during the off-crop season; therefore, loads are at 50% of crop season capacity.

[b] Using maximum F-Factor from historic data available at that time (9,050-10,794 dscf/MMBtu), which resulted in lowest possible heat input and maximum emission rate in lb/MMBtu to compare to limits.

[c] "Inlet" refers to the inlet to the wet cyclone scrubbers and "outlet" refers to the ESP outlet or stack.

[d] HCl emissions are not expected to increase after the wet cyclone scrubbers.

**TABLE 2**
**SUMMARY OF JANUARY 5, 2007, BOILER MACT COMPLIANCE TEST RESULTS ON BAGASSE FOR BOILER NO. 8, U.S. SUGAR CLEWISTON**

| Parameter | Source of Data | C-1 1/5/2007 1058-1158 | C-2 1/5/2007 1345-1445 | C-3 1/5/2007 1622-1722 | C-1 thru C-3 Average | Permit or Subpart DDDDD Limit |
|---|---|---|---|---|---|---|
| Fuel Type | | Bagasse | Bagasse | Bagasse | | |
| Steam Production (lb/hr) | DAHS | 495,700 | 520,349 | 517,492 | **511,180** | – |
| Heat Input (MMBtu/hr) (62% eff.) [a] | DAHS | 918 | 962 | 961 | **947** | – |
| Stack Flow (acfm) | DAHS | 405,983 | 409,422 | 428,583 | **414,663** | – |
| Stack Flow (dscfm) | DAHS | 239,666 | 244,069 | 241,440 | **241,725** | – |
| Stack Temp. (deg. F) | DAHS | 270 | 265 | 309 | **281** | – |
| Oxygen (%) - wet basis | DAHS | 7.75 | 7.65 | 7.09 | **7.50** | – |
| F-Factor (dscf/MMBtu) | Fuel Analysis | 10,904 | 10,804 | 10,843 | **10,850** | – |
| Steam Production (lb/hr) | Stack Test | 499,726 | 520,274 | 510,811 | **510,270** | **550,000** |
| Heat Input (MMBtu/hr) (62% eff.) [a] | Stack Test | 920 | 960 | 948 | **943** | |
| Stack Flow (acfm) | Stack Test | 421,959 | 429,330 | 443,786 | **431,692** | – |
| Stack Flow (dscfm) | Stack Test | 216,073 | 216,113 | 219,030 | **217,072** | – |
| Oxygen (%) - dry basis | Stack Test | 9.29 | 8.72 | 7.57 | **8.53** | – |
| Heat Input from F-Factor (MMBtu/hr) | Stack Test | 795 | 832 | 831 | **820** | **1,030** |
| Particulate Matter based on F-Factor (lb/MMBtu) | Stack Test | 0.012 | 0.009 | 0.012 | **0.011** | **0.025** |
| Nitrogen Oxides (lb/MMBtu) | Stack Test | N/A | N/A | N/A | **N/A** | **0.14** [c] |
| Carbon Monoxide (ppmvd @ 7% $O_2$) | Stack Test | N/A | N/A | N/A | **N/A** | – |
| Sulfur Dioxide (lb/MMBtu) | Stack Test | N/A | N/A | N/A | **N/A** | **0.06** |
| Volatile Organic Compounds (lb/MMBtu) [b] | Stack Test | N/A | N/A | N/A | **N/A** | **0.05** |
| Chlorine (inlet) (lb/MMBtu) | Stack Test | 0.0031 | 0.0027 | 0.0026 | **0.0028** | **N/A** |
| Hydrogen Chloride (inlet) (lb/MMBtu) | Stack Test | 0.0011 | 0.0043 | 0.0015 | **0.0023** | **N/A** |
| Hydrogen Chloride (oulet) (lb/MMBtu) | Stack Test | N/A | N/A | N/A | **N/A** | **0.02** |
| Mercury (lb/MMBtu) | Fuel Analysis | 2.6E-06 | 1.2E-06 | 1.2E-06 | **1.7E-06** | **3.0E-06** |
| Ammonia Slip (ppmvd @ 7% $O_2$) | Stack Test | N/A | N/A | N/A | **N/A** | **20** |
| $NO_x$ CEMS | | | | | | |
| $NO_x$ (lb/hr) | DAHS | 129 | 135 | 130 | **131** | **131** [c] |
| $NO_x$ (lb/MMBtu) | DAHS | 0.14 | 0.14 | 0.14 | **0.14** | **0.14** [d] |
| CO CEMS | | | | | | |
| CO (ppmvd @ 7% $O_2$) | DAHS | 423 | 356 | 505 | **428** | **400** [d] |
| | | | | | | **Operating Limits @ 90%** [e] |
| Urea Injection Rate (gal/hr) | DAHS | 55.9 | 61.1 | 51.6 | **56.2** | – |
| Total ESP Power Input (kW) [f] | DAHS | 30 | 29 | 36 | **32** | **25** |
| Scrubber 1 Water Flow (gal/hr) | DAHS | 26,642 | 26,640 | 12,001 | **21,761** | **10,801** |
| Scrubber 2 Water Flow (gal/hr) | DAHS | 27,001 | 26,999 | 12,000 | **22,000** | **10,800** |

[a] Calculated using steam parameters and 62% thermal efficiency.
[b] VOC as propane.
[c] Applicable only during initial compliance test.
[d] Based on a 30-day rolling average.
[e] Based on 40 CFR 63, Subpart DDDDD: limit is 90% of minimum test value. Although 90 percent of the minimum test run for total ESP power input is 26 kW, the minimum operating limit remains at 25 kW, which was established in the January 2006 crop season testing.
[f] Three fields in operation for C-1, C-2 and C-3.

**TABLE 3**
**BAGASSE FUEL ANALYSIS FOR BOILER NO. 8- U.S. SUGAR CLEWISTON**

| Parameter | Units | C-1 1/5/2007 1058-1158 | C-2 1/5/2007 1345-1445 | C-3 1/5/2007 1622-1722 | Average | Boiler MACT Limit |
|---|---|---|---|---|---|---|
| No. of Samples Composited | | 3 | 3 | 3 | | |
| Moisture | %, as received | 52.42 | 51.62 | 51.55 | 51.86 | |
| Ash | %, as received | 2.45 | 1.63 | 2.53 | 2.20 | |
| Ash | %, dry basis | 5.16 | 3.37 | 5.23 | 4.59 | |
| HHV | Btu/lb, as received | 3,699 | 3,890 | 3,817 | 3802 | |
| HHV | Btu/lb, dry basis | 7,774 | 8,041 | 7,879 | 7898 | |
| Nitrogen | %, as received | 0.13 | 0.13 | 0.14 | 0.13 | |
| Nitrogen | %, dry basis | 0.27 | 0.28 | 0.28 | 0.28 | |
| Chlorine | %, as received | 0.016 | 0.010 | 0.012 | 0.013 | |
| Chlorine | %, dry basis | 0.033 | 0.021 | 0.025 | 0.026 | |
| Chlorine | lb/MMBtu | 0.043 | 0.026 | 0.031 | **0.033** | |
| | | | | **Standard deviation =** | **0.01** | |
| | | | | **t-distribution =** | **1.885618** | |
| | | | | **90th percentile =** | **0.05** | **0.02** |
| Mercury | ppm, as received | 0.010 | 0.005 | 0.005 | 0.007 | |
| Mercury | ppm, dry basis | 0.020 | 0.010 | 0.010 | 0.013 | |
| Mercury | lb/MMBtu | 2.6E-06 | 1.2E-06 | 1.3E-06 | **1.7E-06** | |
| | | | | **Standard deviation =** | **7.6E-07** | |
| | | | | **t-distribution =** | **1.885618** | |
| | | | | **90th percentile =** | **3.E-06** | **3.E-06** |
| Manganese | ppm, dry basis | 23.0 | 18.0 | 19.0 | 20.0 | |
| Manganese | lb/MMBtu | 3.0E-03 | 2.2E-03 | 2.4E-03 | 2.5E-03 | |

Note: % = percent
Btu/lb = British thermal unit per pound
HHV = higher heating value
lb/MMBtu = pound per million British thermal units
ppm = parts per milion

$90^{th}$ percentile = mean + (SD*t)
SD = standard deviation
t = t-distribution critical value for the 90th percentile