Golder Associates Inc.

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October 19, 2000

0037504

Florida Department of Environmental Protection
New Source Review Section
2600 Blair Stone Road
Tallahassee, FL

ATTN: Jeffery Koerner, P.E.

RE: UNITED STATES SUGAR CORPORATION (U.S. SUGAR) – PSD PERMIT APPLICATION FOR BOILER NO. 4 AND THE SUGAR REFINERY AT THE CLEWISTON MILL
REVISED ISC-PRIME MODELING SCENARIO
REQUEST FOR ADDITIONAL INFORMATION NO. 3

Dear Mr. Koerner:

United States Sugar Corporation (U.S. Sugar) has received the Florida Department of Environmental Protection's (FDEP) letter dated October 11, 2000, requesting additional information in regards to the revised ISC-PRIME modeling scenario for the Clewiston mill. Revised modeling scenario results were submitted to the FDEP in a letter from Golder Associates Inc. dated September 8, 2000. The purpose of this letter is to address the questions in the FDEP's letter to address all outstanding issues. The comments are addressed below, in the same order as they appear in the comment letter.

1. It is our understanding that, while EPA must approve use of the ISC-PRIME model, the FDEP approves the actual modeling analysis and results, under delegation from the EPA. EPA approved the use of the ISC-PRIME model for the Clewiston mill on November 4, 1999.

2. The following provides a description of each of the four SO_2 emission tables for the Clewiston mill.

Table 3 HR CROP

CASE A: MAXIMUM HEAT INPUT

- All boilers (Nos. 1, 2, 3, 4, and 7) operating at maximum permitted capacity (i.e., 100-percent capacity).
- Boiler Nos. 1, 2, and 3 are burning the maximum amount of fuel oil possible with 2.5-percent sulfur.
- Boiler No. 4 is burning the maximum amount of fuel oil permitted to be burned with 0.7-percent sulfur (from a separate fuel oil tank).
- Boiler No. 7 is burning 100-percent bagasse, which results in higher SO_2 emissions than burning 0.05-percent sulfur fuel oil.

- This fuel oil burning scenario is consistent with the 3-hour No. 6 fuel oil consumption limitation total for Boiler Nos. 1, 2, 3, and 4 of 16,200 gallons per 3-hr period.
- All stack flow rates and velocities representative of 100-percent load conditions.

CASE B: 80 PERCENT OF MAXIMUM HEAT INPUT

- The same assumptions as Case A, except total steam rate and heat input rate for each boiler is reduced to 80 percent of maximum (80-percent load). Fuel oil burning in all boilers remains as in Case A. Therefore, total SO_2 emissions due to fuel oil burning remain the same as in Case A, but SO_2 due to bagasse burning is reduced.
- Stack flow rate and velocity for each boiler is reduced by 20 percent compared to Case A.

NOTE: For Boiler No. 4, its permit limits maximum fuel oil usage to 1,500 gal/hr. For 0.7-percent oil, the heating value is 142,000 Btu/gal, resulting in a heat input of only 213 MMBtu/hr, as opposed to a heat input of 225.1 MMBtu/hr if higher sulfur No. 6 fuel oil was being burned. The footnotes at the bottom of all four SO_2 emission tables have been corrected to reflect this.

Table 24 HR CROP

CASE A: MAXIMUM HEAT INPUT w/BOILERS 1-3 FIRING OIL

- All boilers (Nos. 1, 2, 3, 4, and 7) operating at their maximum 24-hour capacity. Note that for Boiler Nos. 4 and 7, permit limitations restrict the 24-hour steam production and heat input rates to less than the rates used for the 3-hour scenario.
- Total No. 6 fuel oil consumption or Boiler Nos. 1-4 is limited to 88,800 gallons per 24-hour period, equivalent to 3,700 gal/hr. This total fuel oil consumption was apportioned to Boiler Nos. 1-3, since they burn 2.5-percent sulfur oil, compared to 0.7-percent sulfur oil in Boiler No. 4. First, Boiler No. 3 was apportioned 900 gal/hr, based on its maximum oil firing capability, and because of its lower stack velocity and since Boiler Nos. 1-3 stacks will be raised to the same height of 213 feet. The remaining fuel oil usage was divided equally between Boiler Nos. 1 and 2 (1,400 gal/hr each).
- Boiler No. 4 burning 100-percent bagasse.
- Boiler No. 7 burning 100-percent bagasse, which results in higher SO_2 emissions than burning 0.05-percent sulfur fuel oil.
- Stack flow rate and velocity for each boiler reflective of its heat input.

CASE B: MAXIMUM HEAT INPUT w/BOILERS 1-4 FIRING OIL

- Same as Case A, except that total oil firing (3,700 gal/hr) was distributed approximately equally (based on heat input from oil) among all four boilers.

CASE C: 80 PERCENT OF MAXIMUM HEAT INPUT WITH BOILERS 1-3 FIRING OIL

- The same assumptions as Case A, except total steam rate and heat input rate for each boiler is reduced to 80 percent of Case A (80-percent load). Fuel oil burning in all boilers remains as in Case A. Therefore, total SO_2 emissions due to fuel oil burning remain the same as in Case A, but SO_2 due to bagasse burning is reduced.
- Stack flow rate and velocity for each boiler is reduced by 20 percent compared to Case A.

CASE D: 80 PERCENT OF MAXIMUM HEAT INPUT w/BOILERS 1-4 FIRING OIL

- The same assumptions as Case B, except total steam rate and heat input rate for each boiler is reduced to 80 percent of Case B (80-percent load). Fuel oil burning in all boilers remains as in Case B. Therefore, total SO_2 emissions due to fuel oil burning remain the same as in Case B, but SO_2 due to bagasse burning is reduced.
- Stack flow rate and velocity for each boiler is reduced by 20 percent compared to Case B.

3 HR OFFCROP

CASE A (3-hr)

- Total steam production from all boilers (Nos. 1, 2, 3, 4, and 7) is limited to 1,000,000 lb/hr steam (3-hr avg.).
- Total steam production from Boiler Nos. 1-4 is limited to 615,000 lb/hr (3-hr avg.). The 615,000 lb/hr steam limitation also represents the maximum steam rates for Boiler Nos. 1-3 combined.
- For Boiler Nos. 1-4, only three of these boilers will operate at any one time.
- Boiler Nos. 1, 2 and 3 burning the maximum amount of fuel oil they can burn, with 1.6-percent sulfur.
- Boiler No. 4 is not operating.
- Boiler No. 7 burning 100-percent bagasse, which results in higher SO_2 emissions than burning 0.05-percent sulfur fuel oil.
- This fuel oil burning scenario is consistent with the proposed 3-hour off-crop No. 6 fuel oil consumption limitation total for Boiler Nos. 1-4 of 11,700 gallons per 3-hr period.

CASE B (3-HR)

- Same as Case A, except that Boiler No. 4 is operating at maximum instead of Boiler No. 1, and Boiler Nos. 2 and 3 are operating at slightly reduced rates. Stack velocities are adjusted accordingly.

24 HR OFFCROP

Note: Cases A-C all result in the maximum SO_2 emissions for the 24-hr averaging period, i.e., some combination of Boiler Nos. 1-3 operating to produce 450,000 lb/hr steam (24-hr avg.) while burning a combined 54,000

gal/day of 1.6-percent sulfur, with Boiler No. 4 shutdown. Cases D and E reflect some combination of Boiler Nos. 2-4 operating to produce 450,000 lb/hr steam, with significant oil burning in Boiler No. 4 at 0.7-percent sulfur. All cases reflect Boiler No. 7 operating at maximum.

CASE A (24-HR)

- Total steam production from all boilers (Nos. 1, 2, 3, 4, and 7) is limited to 800,000 lb/hr steam (24-hr average).
- Total steam production from Boiler Nos. 1-4 is limited to 450,000 lb/hr steam (24-hr average).
- For Boiler Nos. 1-4, only three of these boilers will operate at any one time.
- To achieve the 450,000 lb/hr steam from Boiler Nos. 1-4, for this scenario Boiler No. 1 is operating at maximum, and Boiler No. 2 is operating at about 93 percent of maximum. Boiler Nos. 3 and 4 are not operating.
- Boiler Nos. 1 and 2 are burning fuel oil with 1.6-percent sulfur.
- Boiler No. 7 is burning 100-percent bagasse.
- This fuel oil burning scenario is consistent with the proposed off-crop No. 6 fuel oil consumption limitation total for Boiler Nos. 1-4 of 54,000 gallons per 24-hr period (2,250 gal/hr). Total No. 6 fuel oil consumption (total of Boiler Nos. 1, 2, 3 and 4) is limited to 54,000 gallons per 24 period.

CASE B (24-HR)

- Same as Case A, except that Boiler No. 3 is operating at maximum steam rate and Boiler Nos. 1 and 2 are operating at about 60-percent load to make up the remainder of the 450,000 lb/hr steam. Boiler No. 3 is burning the maximum amount of oil (900 gal/hr), while Boiler Nos. 1 and 2 are burning 675 gal/hr oil each to make up the remainder of the total 2,250 gal/hr. Boiler No. 4 is not operating. Stack velocities are adjusted accordingly.

CASE C (24-HR)

- Same as Case B, except Boiler Nos. 1-3 are each operating at about 70-percent load for a total of 450,000 lb/hr steam.

CASE D (24-HR)

- Same as Case A, except that Boiler No. 1 is not operating. Boiler Nos. 2, 3 and 4 are all operating at 70-percent load to achieve the 450,000 lb/hr steam total. Boiler No. 4 is burning the maximum amount of oil (1,500 gal/hr of 0.7-percent sulfur oil), while Boiler No. 3 is burning 749 gal/hr oil to make up the remainder of the total 2,250 gal/hr. Stack velocities are adjusted accordingly.

CASE E (24-HR)

- Same as Case D, except that Boiler No. 3is burning the maximum amount of oil (900 gal/hr of 1.6-percent sulfur oil), while Boiler No. 4 is burning 1,350 gal/hr oil to make up the remainder of the total 2,250 gal/hr.

3. The model output files for the load analysis were attached to the September 8 submittal. From the load analysis, the scenarios resulting in the worst-case impacts for the future Clewiston mill alone were identified for each pollutant and averaging time. These scenarios were then used in the AAQS and PSD increment modeling analysis. The scenarios for each pollutant are shown in Tables 6-21 and 6-23.

4. The PSD baseline SO_2 inventory shown in Table 6-8 for the Clewiston mill is correct based on all available information. As discussed in Golder's May 3, 2000 letter to the Department, in regards to FDEP No. 1 and EPA No. 1 comments, Boiler Nos. 1, 2 and 3 have not changed in relation to steam production rates, maximum heat input rates, oil burning capability, or fuel sulfur content since the PSD 1975 baseline date. Each boiler had no restriction on fuel oil burning in 1975, and therefore Boiler Nos. 1, 2 and 3 could burn up to 1,500, 1,500 and 900 gal/hr, respectively, of 2.5-percent sulfur fuel oil. These are the physical limitations of the fuel oil burners, and have not changed since the baseline date. On this basis, it is reasonable to assume that, during the baseline period, the boilers operated burning the maximum amount of fuel oil for a 3-hour period and up to 88,800 gallons per 24-hour period (which is the current 24-hour fuel burning restriction for the Clewiston mill). In reality, greater quantities of oil may have been burned in a 24-hour period during the baseline, because of the low cost of fuel oil at the time. For this reason, the baseline SO_2 emissions for Boiler Nos. 1, 2 and 3 were set equal to the future maximum SO_2 emissions for these boilers, as presented in Table 6-3 of the original Boiler No. 4 modification application submitted in June 1999. Note that since the June 1999 application, changes have been made to the maximum future SO_2 emissions for these boilers.

For SO_2 emissions from the East and West Pellet mills for the baseline period, air construction permit applications dated October 1974 formed the basis. The applications showed 39,000 lbs/day of 2.5-percent sulfur oil as feed to the burners for each plant:

$$39{,}000 \text{ lbs/day} \times 2.5\% \text{ S} \times 2 / 24 = 81.3 \text{ lb/hr} = 10.3 \text{ g/s}$$

The stack heights of Boiler Nos. 1, 2 and 3 as of the 1975 baseline date are well documented in the historic permitting files and permit applications (for example, the 1984 application for Boiler No. 4). The heights were 75 feet for Boiler Nos. 1 and 2, and 90 feet for Boiler No. 3.

Please call or e-mail me if you have any additional 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

DB/jkw

Attachments

cc: Don Griffin
Bill Wehrum
Lisa Gefen
Stan Krivo, EPA Region IV
National Park Service
D. Knuelle, SD

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Mr. Murray T. Brinson
Vice President
United States Sugar Corp.
111 Ponce De Leon Ave
Clewiston, FL 33440

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Department of
Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

October 11, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Murray T. Brinson, Vice President
United States Sugar Corporation
111 Ponce DeLeon Avenue
Clewiston, FL 33440

Re: Additional Information Request No. 3
DEP File No. 0510003-010-AC (PSD-FL-272A)
Boiler No. 4 Modification – Part 2
Revised ISC Prime Modeling Scenario

Dear Mr. Brinson:

On September 11, 2000 the Department received additional information for the above referenced project. The Department reviewed this information and has some additional questions regarding the revised modeling scenario. The application remains incomplete. In order to continue processing your application, the Department will need the additional information attached to this letter. Should your response to any of the below items require new calculations, please submit the new calculations, assumptions, reference material and appropriate revised pages of the application form.

1. As was stated early in the permitting process for this project, since the modeling was performed using ISC Prime, EPA must approve the results. The department is waiting for EPA's comments, and will forward them to you as soon as we receive them.
2. The four tables summarizing the modeling inputs for determining SO_2 impacts from the project are confusing. Please clarify these tables by providing a thorough description of each SO_2 operating scenario modeled. Provide the basis for the operating conditions, steam production rates (percent capacity) and oil consumption.
3. Please clarify which operating scenario provided the worst-case impacts for each pollutant.
4. Please provide detailed calculations justifying the emission rates used for the PSD baseline modeling inputs. Were the stack heights for boilers 1, 2 and 3 only 23.1, 23.1 and 27.4 m, respectively?

The Department will resume processing your application after receipt of the requested information. Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature.

A new certification statement by the authorized representative or responsible official must accompany any material changes to the application. Rule 62-4.055(1), F.A.C. now requires applicants to respond to requests for information within 90 days. If you have any questions, please call me at 850/414-7268. Matters regarding modeling issues should be directed to the project meteorologist, Cleve Holladay, at 850/921-8986.

Sincerely,

Cleve Holladay, Project Meteorologist
New Source Review Section

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cc: Mr. David Buff, P.E., Golder Associates
Mr. David Knowles, SD
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS