12/18 Willard
fyi
pls inform Mike Harley of this; might be worth one of testers witnessing
Cl

UNITED STATES SUGAR CORPORATION

Post Office Drawer 1207 Clewiston, Florida 33440
Telephone: (813) 983-8121 Telex: 510-952-7753

December 15, 1992

RECEIVED

DEC 17 1992

Division of Air Resources Management

Mr. David Knowles
Florida Department of Environmental
Regulation
2295 Victoria Avenue - Suite 364
Fort Myers, Fl. 33901-2896

RE: Hendry County - AP
U. S. Sugar Corporation
Clewiston Boiler No. 4
Permit No. AO-25-14701

Dear Mr. Knowles:

Enclosed is the application of United States Sugar Corporation for the renewal of the air operation permit for Clewiston Boiler No. 4, located at the Clewiston sugar processing plant, together with check for $2,000.00 to cover the permit renewal fee.

In accordance with Specific Conditions 7, 9, and 12 of the current permit issued on February 15, 1988, we will conduct compliance tests before February 15, 1993. We will advise your office of the exact dates of the testing as soon as those dates are available. Within 14 days of the compliance test, we will test Boiler No. 4 in accordance with the ASME short-form procedure. The results of this testing will be submitted as soon as they can reasonably be prepared, but no later than 45 days after testing.

We recognize that you will need the results of this testing before taking action to approve the application for renewal. Pursuant to our discussions, we further understand that, until final action is taken on the pending application, the current permit will continue in full force and effect and that we must continue to comply with the conditions of that permit, as previously amended, until a new permit is issued.

As per your suggestion, we have informed Tallahassee of our requests stated herein. Mr. Willard Hanks during this conversation mentioned that you would be able to decide and resolve minor modifications out of the Department's Fort Myers office, but to copy Mr. Clair Fancy. Since this is a PSD boiler, we are also sending a copy to EPA Region IV.

We look forward to hearing from you on this matter.

Sincerely,

UNITED STATES SUGAR CORPORATION

Murray D. Brinson

Murray T. Brinson
Director of Sugar Houses

MTB:jt

Enclosures

cc: Mr. Clair Fancy, DER, Tallahassee
Ms. Jewell Harper, EPA, Atlanta
Mr. Peter Briggs
Mr. Peter Barquin
Mr. David Buff

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION FOR RENEWAL OF PERMIT TO OPERATE AIR POLLUTION SOURCE(S)

If major alterations have occurred, the applicant should complete the Standard Air Permit Application Form.

Source Type: *Bagasse/Oil-Fired Boiler* Renewal of DER Permit No. *A026-144701*

Company Name: *U.S. Sugar Corporation* County: *Hendry*

Identify the specific emission point source(s) addressed in this application (i.e., Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired): *Boiler No. 4 with wet scrubber*

Source Location: Street: *W.C. Owens Avenue & S.R. 832* City: *Clewiston*

UTM: East *506.1* North *2,956.9*

Latitude: *2 6*° *4 4*' *0 5*"N Longitude: *8 0*° *5 6*' *1 9*"W.

---

1. Attach a check made payable to the Department of Environmental Regulation in accordance with operation permit fee schedule set forth in Florida Administrative Code Rule 17-4.05.

2. Have there been any alterations to the plant since last permitted? [ ] Yes [*X*] No If minor alterations have occurred, describe on a separate sheet and attach.
   See ATTACHMENT "B"

3. Attach the last compliance test report required per permit conditions if not submitted previously. *previously submitted*

4. Have previous permit conditions been adhered to? [ ] Yes [*X*] No If no, explain on a separate sheet and attach.
   See ATTACHMENT "C"

5. Has there been any malfunction of the pollution control equipment during tenure of current permit? [ ] Yes [*X*] No If yes, and not previously reported, give brief details and what action was taken on a separate sheet and attach.

6. Has the pollution control equipment been maintained to preserve the collection efficiency last permitted by the Department? [*X*] Yes [ ] No

7. Has the annual operating report for the last calendar year been submitted? [*X*] Yes [ ] No If no, please attach.

8. Please provide the following information if applicable:

A. Raw Materials and Chemical Used in Your Process:

Description	Contaminant Type	%Wt	Utilization Rate	lbs/hr
Not Applicable				

B. Product Weight (lbs/hr): *Not Applicable*

C. Fuels

Type (Be Specific)	Consumption* Avg/hr*	Max/hr**	Maximum Heat Input (MMBTU/hr)
Bagasse		*215,889 lb/hr-wet*	*777.2*
No. 6 Fuel Oil		*1,500 gal/hr*	*225.0*

D. Normal Equipment Operating Time: hrs/day *24*; days/wk *7*; wks/yr *22.8*; hrs/yr (power plants only) ____; if seasonal, describe

Operation is seasonal, normally October to March

The undersigned owner or authorized representative*** of U.S. Sugar Corporation is fully aware that the statements made in this application for a renewal of a permit to operate an air pollution source are true, correct and complete to the best of his knowledge and belief. Further, the undersigned agrees to maintain and operate the pollution source and pollution control facilities in such a manner as to comply with the provisions of Chapter 403, Florida Statutes, and all the rules and regulations of the Department. He also understands that a permit, if granted by the Department, will be non-transferable and he will promptly notify the Department upon sale or legal transfer of the permitted facility.

* During actual time of operation.
** Units: Natural Gas-MMCF/hr; Fuel Oils-barrels/hr; Coal-lbs/hr.
*** Attach letter of authorization if not previously submitted

Murray D. Brinson

Signature, Owner or Authorized Representative
(Notarization is mandatory)

Murray T. Brinson, Director, Sugar Houses
Typed Name and Title

P.O. Drawer 1207
Address

Clewiston FL 33440
City State Zip

12/15/92 (813) 983-8121
Date Telephone No.

STATE OF FLORIDA
COUNTY OF HENDRY

Sworn to and subscribed before me this 15th day of Dec., 1992.

My commission expires:

JUANITA M. TAYLOR
MY COMMISSION # CC 232759
EXPIRES: October 5, 1996
Bonded Thru Notary Public Underwriters

Juanita M Taylor

Notary Public, State of Florida at Large

Personally Known ☒ OR Produced Identification ☐
Type of Identification Produced: ____

OPERATION PERMIT RENEWAL
PROFESSIONAL ENGINEER CERTIFICATION

This certification must be attached to the renewal application (required by Rule 17-4.050(3), FAC) for :

Company Name: *U.S. Sugar Corporation*

Source ID: *52/26/0003/09*

County: *Hendry*

Renewal of DER Permit No.: *A026-144701*

PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (WHERE REQUIRED BY Chapter 471, F.S.)

This is to certify that the engineering features of this pollution source(s) have been examined by me and found to be in conformity with good engineering principles which provide reasonable assurance, in my professional judgment, that the pollution source(s), when properly maintained and operated, will discharge an effluent that complies with all applicable Statutes of the State of Florida and the rules and regulations of the Department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution source(s).

Signed David A. Buff

David A. Buff
Name (Please Type)

DAVID A. BUFF CERTIFICATE NO. 19011 STATE OF FLORIDA REGISTERED ENGINEER

Affix Seal

KBN Engineering and Applied Sciences, Inc.
Company Name (Please Type)

1034 N.W. 57th Street, Gainesville, FL 32605
Mailing Address (Please Type)

Florida Registration No. *19011*

Date 12/3/92

Telephone No. *(904)331-9000*

DER FORM 17-1.202(4) -----attachment (Effective 10-01-88)
(Revised 04-10-91)

12033Y1/F2/ARPS.ATT (11/23/92)

ATTACHMENT A

Application for Renewal of Permit to Operate

Boiler No. 4

U.S. Sugar Corporation - Clewiston Mill

In this application for renewal of the operating permit for Boiler No. 4, U.S. Sugar requests that Specific Conditions 5, 8, and 13 in the current operating permit be revised. The requested changes are summarized as follows:

Specific Condition 5 -	A revision is requested to provide that the limit on burning more than 6,300 gallons of fuel oil in any 3 hour period, which is intended as a limit on emissions, may be exceeded during startup, shutdown or malfunction in accordance with DER Rule 17-2.250, F.A.C.
Specific Condition 8 -	A revision is requested to incorporate the clarification provided by DER on October 26, 1989, with respect to the timing of measurements.
Specific Condition 13 -	U.S. Sugar has completed testing carbon monoxide (CO) emissions from Boiler No. 4 using EPA Method 10 and requests the establishment of a reasonable CO limit, as previously intended by DER. The proposed emission limit and the basis for the limit is provided.

Each of these items are discussed in the following paragraphs.

<u>Specific Condition 5</u>

This condition in the current permit requires that during any 3-hour period, not more than 6,300 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. This condition is included in the permit to limit SO_2 emissions. It is requested that this condition be revised to permit excess emissions resulting from startup, shutdown or malfunction, such as when power is lost at the mill. Startup conditions occur during the "grind-in" period (which usually occurs on one day approximately one week prior to the sugar mill startup), during startup of the sugar mill at the beginning of the crop season, and at other times when the mill has been shut down for an extended period (such as during the Christmas holidays). The purpose of the grind-in period is to test major equipment for proper operation. Plant emergencies are very rare, but when they do occur, bagasse feed to the boilers may be interrupted, and it may become necessary to switch to fuel oil.

Excess emissions during these limited and unusual periods are expressly allowed under DER Rule 17-2.250, F.A.C. The rule allows excess emissions from fossil fuel steam generators during such periods "provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions" is minimized. It is readily apparent that this rule was intended to cover precisely the type of situation encountered by U.S. Sugar during startups and other emergencies. Indeed, the rule would apply by its own terms if Specific Condition 5 were expressed as an emission limit rather than a fuel burning limit. Accordingly, we request that Specific Condition 5 be revised to read as follows:

5. During any 3-hour period, not more than 6,300 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. Excess fuel oil burning resulting from startup, shutdown, or malfunction of any source shall be permitted provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized. All permits to operate other oil burning equipment at this plant are revised to include this limitation.

Specific Condition 8

DER has clarified the intent of Specific Condition 8 of the current operating permit to required that the flue gas pressure drop across the scrubber be measured and recorded once in each 8-hour shift. Reference letter from Phillip R. Edwards, Deputy Assistant Secretary of DER, to Peter Barquin of U.S. Sugar Corporation, October 26, 1989 (copy enclosed). The letter states further that the pH of the scrubber water shall be measured and recorded once per day. We request that Specific Condition 8 of the permit be revised to reflect these modified requirements.

Specific Condition 13

Specific Condition 13 of the current permit limits CO emissions to 0.25 lb/MMBtu as determined by EPA Method 10. U.S. Sugar has addressed the concern with this condition in a letter addressed to DER dated October 8, 1990.

The concern with the condition is that the 0.25 lb/MMBtu limit was not based on Method 10 testing, but was based instead on EPA emission factors which have proven to be inappropriate as estimates of actual CO emissions from sugar processing mills. Subsequent testing at U.S. Sugar and other sugar mills has demonstrated that the 0.25 lb/MMBtu limit is much too low based on Method 10 testing, as acknowledged by the USEPA Region IV and the DER through correspondence in 1989.

Presented in the attached Table 1 are CO test results for the three mills known to have conducted Method 10 tests. A total of 20 individual test runs have been conducted on Boiler No. 4 at the U.S. Sugar mill in Clewiston. These were all conducted by Air Consulting and Engineering, Inc. Boiler No. 4 is a traveling grate boiler. The average CO emission rate for this boiler, as reflected in the test data, is 5.44 lb/MMBtu. The individual measurements range from 2.2 to 14.9 lb/MMBtu.

In order to determine an acceptable upper CO limit for compliance purposes, a statistical analysis of the test data was performed, using the average test results from each test date, consistent with the manner in which compliance tests are performed. The average test results are shown in Table 2. A frequency distribution for the data is presented in Figure 1. This plot shows that a CO emission level of 9.0 lb/MMBtu would have the probability of being exceeded only about 10 percent of the time. This probability of exceedance is acceptable to U.S. Sugar. Therefore, U.S. Sugar requests an allowable CO emission rate of 9.0 lb/MMBtu for Boiler No. 4.

Table 1. Summary of CO Emission Tests Performed on Bagasse Boilers in Florida Using EPA Method 10

Unit	Boiler Type	Date	Steam Rate (lb/hr)	Heat Input (MMBtu/hr)	Bagasse Firing Rate[a] (TPH wet)	CO Emissions lb/hr	CO Emissions lb/MMBtu	CO Emissions lb/ton,wet
U.S. Sugar Bryant								
Boiler 5	Vibrating Grate	02/16/89	256,928	577	80.14	2,586.9	4.48	32.28
Boiler 5	Vibrating Grate	02/17/89	249,228	561	77.92	2,658.0	4.74	34.11
Boiler 5	Vibrating Grate	02/17/89	249,480	562	78.06	1,693.3	3.01	21.69
						Max. =	4.74	34.11
						Avg. =	4.08	29.36
Osceola Farms								
Boiler 3	Fuel Cell	01/17/89	NA	NA	NA	NA	3.07	22.10
Boiler 3	Fuel Cell	12/05/89	NA	NA	NA	NA	0.81	5.83
Boiler 3	Fuel Cell	01/24/90	NA	NA	NA	NA	3.14	22.61
Boiler 6	Traveling Grate	01/16/89	NA	NA	NA	NA	5.42	39.02
Boiler 6	Traveling Grate	11/15/89	NA	NA	NA	NA	5.48	39.46
Boiler 6	Traveling Grate	02/02/90	NA	NA	NA	NA	5.93	42.70
						Max. =	5.93	42.70
						Avg. =	3.98	28.62
U.S. Sugar - Clewiston								
Boiler 4	Traveling Gate	02/20/90	308,636	691.7	96.07	1,940	2.80	20.19
Boiler 4	Traveling Gate	02/20/90	306,666	690.3	95.88	1,520	2.20	15.85
Boiler 4	Traveling Gate	02/20/90	310,298	698.8	97.06	2,240	3.20	23.08
Boiler 4	Traveling Gate	02/15/91	289,091	624.9	86.79	4,760	7.62	54.84
Boiler 4	Traveling Gate	02/15/91	291,200	629.5	87.43	2,710	4.30	31.00
Boiler 4	Traveling Gate	02/18/91	288,358	622.8	86.50	2,430	3.90	28.09
Boiler 4	Traveling Gate	02/18/91	285,224	616.4	85.61	2,640	4.28	30.84
Boiler 4	Traveling Gate	02/18/91	302,647	653.3	90.74	2,060	3.16	22.70
Boiler 4	Traveling Gate	02/19/91	290,769	627.9	87.21	4,430	7.05	50.80
Boiler 4	Traveling Gate	02/19/91	294,583	637.1	88.49	3,400	5.33	38.42
Boiler 4	Traveling Gate	02/19/91	293,382	633.5	87.99	2,480	3.92	28.19
Boiler 4	Traveling Gate	02/22/91	300,000	647.9	89.99	4,900	7.56	54.45
Boiler 4	Traveling Gate	02/22/91	293,382	634.2	88.08	9,450	14.90	107.28
Boiler 4	Traveling Gate	01/07/92	293,425	613.6	85.22	3,200	5.22	37.55
Boiler 4	Traveling Gate	01/07/92	282,800	591.3	82.13	6,270	10.60	76.35
Boiler 4	Traveling Gate	01/08/92	299,178	623.2	86.56	2,030	3.26	23.45
Boiler 4	Traveling Gate	01/08/92	297,973	621.5	86.32	3,160	5.09	36.61
Boiler 4	Traveling Gate	01/08/92	300,811	627.4	87.14	3,540	5.64	40.62
Boiler 4	Traveling Gate	01/09/91	302,055	630.0	87.50	2,770	4.40	31.66
Boiler 4	Traveling Gate	01/09/91	295,135	615.8	85.53	2,710	4.40	31.69
						Max. =	14.90	107.28
						Avg. =	5.44	39.18

Note: lb/hr = pounds per hour.
lb/MMBtu = pounds per million British thermal units.
lb/ton = pounds per ton.
MMBtu/hr = million British thermal units per hour.
NA = not available.
TPH = tons per hour.

[a] Calculated from reported heat input rate, assumed 3,600 Btu/lb average heat content for wet bagasse.

Table 2. Summary of CO Test Averages, U.S. Sugar Clewiston Boiler No. 4

Test Date	Number of Runs	Average CO Emissions (lb/MM Btu)
February 20, 1990	3	2.73
February 15, 1991	2	3.97
February 18, 1991	3	3.78
February 19, 1991	3	5.43
February 22, 1991	2	11.23
January 7, 1992	2	7.91
January 8, 1992	3	4.66
January 9, 1992	2	4.40

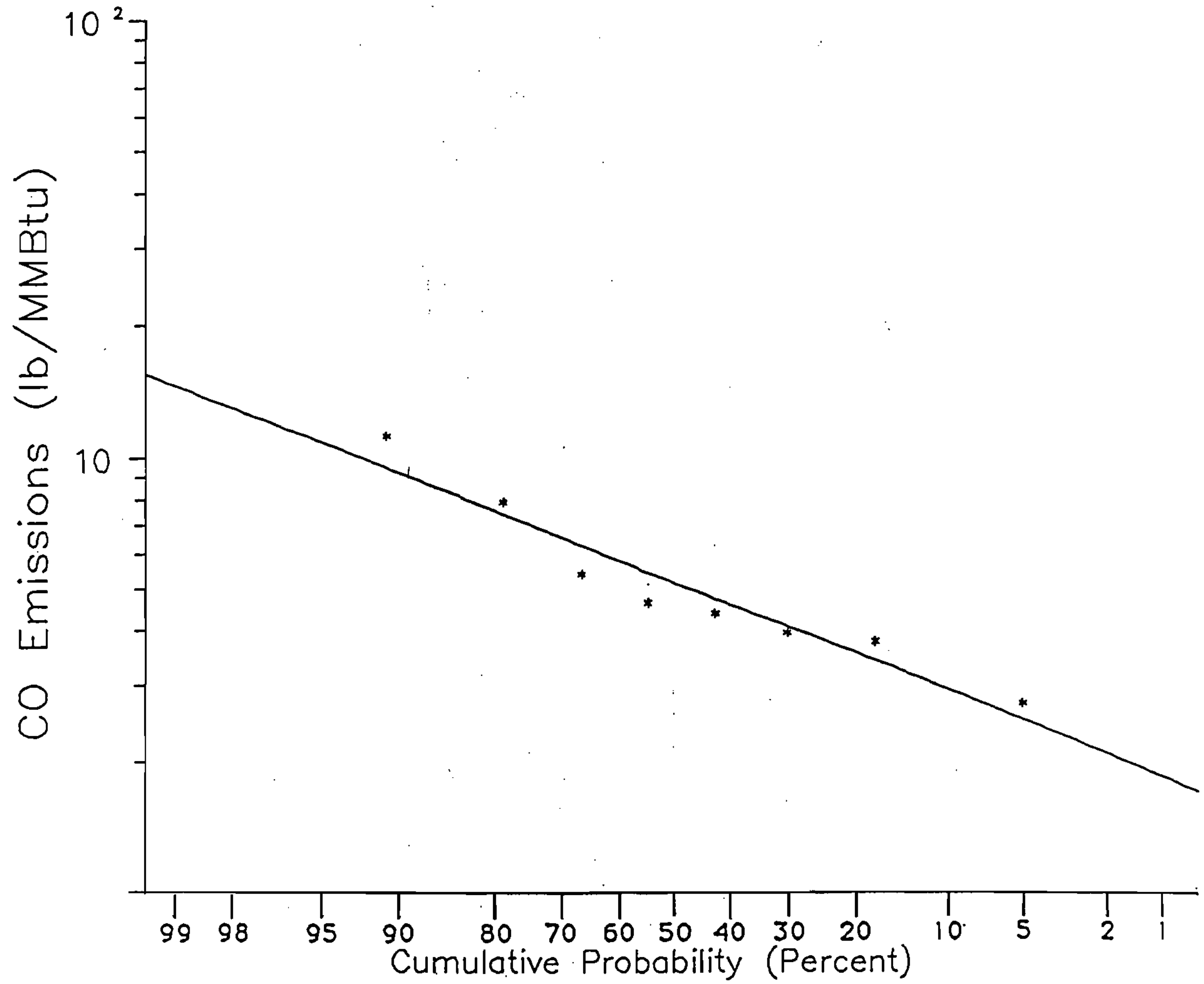


Figure 1 FREQUENCY DISTRIBUTION OF CO TEST DATA, CLEWISTON BOILER NO. 4

ATTACHMENT B

Application for Renewal of Permit to Operate

Boiler No. 4

U.S. Sugar Corporation - Clewiston Mill

No plant or process changes have been made. Modifications of pollution control equipment for Boiler No. 1 were completed as approved by the Department on July 24, 1992.

ATTACHMENT C

Application for Renewal of Permit to Operate

Boiler No. 4

U.S. Sugar Corporation - Clewiston Mill

Because the underlying assumptions about carbon monoxide emission rates have proven to be erroneous, we have not complied with Specific Condition 13 of the permit. The inappropriateness and inapplicability of this condition has been recognized and acknowledged by the Department in correspondence with U.S. Sugar. Reference the letter from Philip Edwards of DER to Peter Barquin of U.S. Sugar, dated October 26, 1989. Accordingly, U.S. Sugar has conducted testing pursuant to instructions from the Department to provide the basis for establishing reasonable CO emissions levels for this boiler. The results of that testing are included in Attachment A of this application, and U.S. Sugar is requesting a revision of Specific Condition 13.

In addition, it has not always been possible to complete testing in accordance with the dates specified in the specific conditions of this permit. On those occasions when testing would not be completed within the specified time period, U.S. Sugar has advised the Department of the specific date scheduled for testing and has obtained authorization to complete testing on the alternative date, allowing an opportunity for witnessing by the Department.

Best Available Copy

Florida Department of Environmental Regulation

South District • 2269 Bay Street • Fort Myers, Florida 33901-2896 • 813-332-2667

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary | Philip Edwards, Deputy Assistant Secretary

October 26, 1989

Peter Barquin
U. S. Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

Re: Hendry County - AP
U. S. Sugar Corporation
Boiler No. 4
AC26-126965 and AO26-144701

Dear Mr. Barquin:

As requested in your recent telephone conversation with David Knowles, we hereby clarify the intent of the specific conditions of the operating permit AO26-144701 for boiler No. 4.

The intent of specific condition No. 8 is that the flue gas pressure drop across the scrubber be measured and recorded once in each 8 hour shift. The pH of the scrubber water shall be measured and recorded once per day.

We request that you test the CO emissions from Boiler #4 using EPA Method 10 during the 1989-1990 crop season. The purpose of the this test is to help us determine a reasonable CO emission factor for boilers of this type. Please notify this office in advance of the date and time of each test.

If you have any questions please call David Knowles.

Sincerely,

Philip A. Barbosa
for

Philip R. Edwards
Deputy Assistant Secretary

PRE/DMK/jsw

cc: Williard Hanks

UNITED STATES SUGAR CORPORATION
Post Office Drawer 1207 Clewiston, Florida 33440
Telephone: (813) 983-8121 Telex: 510-952-7753

October 8, 1990

Mr. David Knowles
Florida Department of Environmental Regulation
2269 Bay Street
Fort Myers, Florida 33901-2896

RE: Hendry County - AP
U. S. Sugar Corporation
Clewiston Boiler No. 4
Permit AC26-126965 and A026-144701

Dear Mr. Knowles:

Following Mr. Philip R. Edward's request as per his letter of October 26, 1989, we are sending you Report No. 1376-A for CO Emissions from Boiler No. 4.

We would have wanted to make more tests in this boiler, but due to certain difficulties with the testing company and the early end of the crop due to the extensive freeze which we sustained last winter, we were unable to run a more adequate number of tests.

Results from these three (3) one (1) hour runs might not be representative of the actual range and average emissions from this boiler.

The purpose of this test as requested by Mr. Edwards is to help the Department determine a reasonable CO Emission Factor for boilers of this type. We suggest you consider and evaluate the results of the nine (9) runs carried out at our Bryant Boiler No. 5 as well, in making this determination.

Very truly yours,

UNITED STATES SUGAR CORPORATION

Peter Barquin
Administative Ass't. to
Senior Vice President
Sugar Houses

PB:jt
Enclosures

UNITED STATES SUGAR CORPORATION

Post Office Drawer 1207 Clewiston, Florida 33440
Telephone: (813) 983-8121 Telex: 510-952-7753

July 27, 1993

RECEIVED

JUL 30 1993

Division of Air
Resources Management

Mr. David Knowles
Florida Department of Environmental
Protection, South District
2295 Victoria Ave. - Suite 364
Fort Myers, Fl. 33901-2796

Re: U. S. Sugar Corporation - Clewiston Boiler No. 4 -
December 15, 1992 Application for Permit Renewal

Dear Mr. Knowles:

This letter responds to the District's letter dated January 12, 1993, regarding our December 15, 1992 air operation permit renewal application for Clewiston Boiler No. 4 (permit no. AO26-144701). There appears to be some misunderstanding about certain of the items addressed in the renewal application. In particular, the January 12 letter suggest the possible need for a new or revised PSD construction permit to address the requested change in specific condition 13.

Because the requested change is essentially an administrative revision that will not alter the applicable control technology requirement for carbon monoxide, our attorneys have advised us that there should be no need for a new or modified construction permit. U. S. Sugar is not requesting that the Department issue a new operating permit with control requirements less stringent than those contained in the original construction permit (no. AC26-80930). Rather, we are requesting that the emission factor for CO in specific condition 13 be changed to a factor that reflects more accurately the CO emissions that result from implementation of the approved control technology, as measured in accordance with the prescribed measurement method.

In requesting that DEP revise the CO emission factor for Boiler No. 4, United States Sugar Corporation (U.S. Sugar) is not asking DEP to modify the existing CO emissions control requirement. CO emissions will continue to be limited to those resulting from implementation of the best available control technology (BACT) as determined by the Department in the current construction permit. We are simply following through with the administrative process initiated by the Department in 1989 when DEP and U. S. Sugar together recognized that the 0.25 lbs/MMBtu CO emission factor set forth in specific condition 13 of the operating permit does not accurately reflect the actual CO emissions from Boiler No. 4 as measured with EPA Method 10 when the boiler is operated in accordance with the approved control technology requirements.[1] Consequently, U. S. Sugar's request that DEP revise the CO emission factor stated in the condition does not represent an operational change in the boiler or in the applicable control technology requirement. It is simply an administrative revision to accurately reflect CO emissions.

Most significantly, U. S. Sugar is not asking DEP to modify[2] the emission control requirements in the Boiler No. 4 permit. When U. S. Sugar originally applied for a construction permit for Boiler No. 4, it prompted DER to make a BACT determination for CO. In its final analysis, DER determined that good firing and operational practices constitute BACT to control CO emissions. DER noted: "The department does not believe that an add on system to control CO emissions is justified."[3] Thus, in determining BACT for CO, DER did not concluded that it would be

---

1/ On October 26, 1989, Philip R. Edwards, Deputy Assistant Secretary of the Department of Environmental Regulation (DER) requested U. S. Sugar to test CO emissions from Boiler No. 4 using EPA Method 10 during the 1989-1990 crop season. The purpose of the test was to "help [DER] determine a reasonable CO emission factor for boilers of this type." On October 8, 1990, U. S. Sugar sent to DER Report No. 1376-A for CO emissions from Boiler No. 4. In a letter accompanying the report, U. S. Sugar noted that the report was submitted in response to DER's October 26, 1989 request.

2/ The correction of specific condition 13 to reflect actual CO emissions does not fall within the definition of "modification" set forth in the regulations. See Rule 17-212.400(46), F.A.C., as amended, December 9, 1992. Identical language is used in Rule 17-297.200(87), F.A.C. (Stationary Sources - Emissions Monitoring).

3/ BACT Determination accompanying Construction Permit attached to January 11, 1985 letter from M. C. H. Fancy, Deputy Chief, Bureau of Air Quality Management, to Mr. A. R. Mayo, Vice President, U. S. Sugar Corporation.

necessary to require Boiler No. 4 to achieve an emission level of 0.25 lbs/MMBtu. This level has simply been used in the past, without any verification, as the standard emission factor for bagasse boilers on the assumption that it would reflect the capability of the approved control technology for a bagasse boiler.

Now, the test data demonstrate that this level is wholly inconsistent with the results of EPA Method 10. Test data compiled by U. S. Sugar and by other bagasse fired boiler operators shows that the 0.25 lbs/MMBtu CO emission factor is low.[4] Accordingly, U. S. Sugar and DEP have agreed that it is appropriate to reevaluate and revise the emission factor in Boiler No. 4's operating permit to reflect accurately the CO emissions that result from implementation of the BACT determination.

The data provided in support of the permit renewal application reflect the results of the reevaluation process and provide the basis to establish the appropriate emission factor for Clewiston Boiler No. 4. In light of these considerations, we believe that a new PSD construction permit is not required.

For your convenience, we are enclosing a corrected copy of the application to renew permit AO26-144701. We found and corrected typographical errors in the tables. Please contact me if you have any questions about the application or this letter.

Very truly yours,

UNITED STATES SUGAR CORPORATION

Peter Barquin
Administrative Assistant
Sugar Houses

PB:jt

Enclosures
cc: Ms. Jewel Harper, EPA, Atlanta
Mr. C. H. Fancy, P.E., DEP, Tallahassee
Mr. Murray Brinson
Mr. Bert Starrett
Mr. Peter Briggs
Mr. Robert Van Voorhees

4/ June 21, 1989 letter from C. H. Fancy, P.E., Deputy Chief, Bureau of Air Quality Management, to Mr. A. R. Mayo, Senior Vice President, United States Sugar Corporation.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION FOR RENEWAL OF PERMIT TO OPERATE AIR POLLUTION SOURCE(S)

If major alterations have occurred, the applicant should complete the Standard Air Permit Application Form.

Source Type: *Bagasse/Oil-Fired Boiler* Renewal of DER Permit No. *AO26-144701*

Company Name: *U.S. Sugar Corporation* County: *Hendry*

Identify the specific emission point source(s) addressed in this application (i.e., Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired): *Boiler No. 4 with wet scrubber*

Source Location: Street: *W.C. Owens Avenue & S.R. 832* City: *Clewiston*

UTM: East *506.1* North *2,956.9*

Latitude: *2 6*° *4 4*' *0 5*"N Longitude: *8 0*° *5 6*' *1 9*"W.

---

1. Attach a check made payable to the Department of Environmental Regulation in accordance with operation permit fee schedule set forth in Florida Administrative Code Rule 17-4.05.

2. Have there been any alterations to the plant since last permitted? [ ] Yes [*X*] No If minor alterations have occurred, describe on a separate sheet and attach. *See ATTACHMENT "B"*

3. Attach the last compliance test report required per permit conditions if not submitted previously. *previously submitted*

4. Have previous permit conditions been adhered to? [ ] Yes [*X*] No If no, explain on a separate sheet and attach. *See ATTACHMENT "C"*

5. Has there been any malfunction of the pollution control equipment during tenure of current permit? [ ] Yes [*X*] No If yes, and not previously reported, give brief details and what action was taken on a separate sheet and attach.

6. Has the pollution control equipment been maintained to preserve the collection efficiency last permitted by the Department? [*X*] Yes [ ] No

7. Has the annual operating report for the last calendar year been submitted? [*X*] Yes [ ] No If no, please attach.

8. Please provide the following information if applicable. **Best Available Copy**

A. Raw Materials and Chemical Used in Your Process:

Description	Contaminant		Utilization	
	Type	%Wt	Rate	lbs/hr
Not Applicable				

B. Product Weight (lbs/hr): *Not Applicable*

C. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	Avg/hr*	Max/hr**	
Bagasse		*215,889 lb/hr-wet*	*777.2*
No. 6 Fuel Oil		*1,500 gal/hr*	*225.0*

D. Normal Equipment Operating Time: hrs/day *24*; days/wk *7*; wks/yr *22.8*; hrs/yr (power plants only) ____; if seasonal, describe

Operation is seasonal, normally October to March

The undersigned owner or authorized representative*** of U.S. Sugar Corporation is fully aware that the statements made in this application for a renewal of a permit to operate an air pollution source are true, correct and complete to the best of his knowledge and belief. Further, the undersigned agrees to maintain and operate the pollution source and pollution control facilities in such a manner as to comply with the provisions of Chapter 403, Florida Statutes, and all the rules and regulations of the Department. He also understands that a permit, if granted by the Department, will be non-transferable and he will promptly notify the Department upon sale or legal transfer of the permitted facility.

* During actual time of operation.

** Units: Natural Gas-MMCF/hr; Fuel Oils-barrels/hr; Coal-lbs/hr.

*** Attach letter of authorization if not previously submitted

Signature, Owner or Authorized Representative
(Notarization is mandatory)

Murray T. Brinson, Director, Sugar Houses
Typed Name and Title

P.O. Drawer 1207
Address

Clewiston — FL — 33440
City — State — Zip

12/15/92 — (813) 983-8121
Date — Telephone No.

STATE OF FLORIDA
COUNTY OF HENDRY

Sworn to and subscribed before me this *15th* day of *Dec.*, 1992.

My commission expires:

JUANITA M. TAYLOR
MY COMMISSION # CC 232759
EXPIRES: October 5, 1996
Bonded Thru Notary Public Underwriters

Juanita M. Taylor
Notary Public, State of Florida at Large

Personally Known ☒ OR Produced Identification ☐
Type of Identification Produced:

OPERATION PERMIT RENEWAL
PROFESSIONAL ENGINEER CERTIFICATION

This certification must be attached to the renewal application (required by Rule 17-4.050(3), FAC) for :

Company Name: *U.S. Sugar Corporation*

Source ID: *52/26/0003/09*

County: *Hendry*

Renewal of DER Permit No.: *A026-144701*

PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (WHERE REQUIRED BY Chapter 471, F.S.)

This is to certify that the engineering features of this pollution source(s) have been examined by me and found to be in conformity with good engineering principles which provide reasonable assurance, in my professional judgment, that the pollution source(s), when properly maintained and operated, will discharge an effluent that complies with all applicable Statutes of the State of Florida and the rules and regulations of the Department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution source(s).

Signed David A. Buff

David A. Buff
Name (Please Type)

Affix Seal

KBN Engineering and Applied Sciences, Inc.
Company Name (Please Type)

1034 N.W. 57th Street, Gainesville, FL 32605
Mailing Address (Please Type)

Florida Registration No. *19011*

Date 12/3/92

Telephone No. *(904)331-9000*

DER FORM 17-1.202(4) -----attachment (Effective 10-01-88)
(Revised 04-10-91)

12033Y1/F2/ARPS.ATT (11/23/92)

ATTACHMENT A
Application for Renewal of Permit to Operate
Boiler No. 4
U.S. Sugar Corporation - Clewiston Mill

In this application for renewal of the operating permit for Boiler No. 4, U.S. Sugar requests that Specific Conditions 5, 8, and 13 in the current operating permit be revised. The requested changes are summarized as follows:

Specific Condition 5 -	A revision is requested to provide that the limit on burning more than 6,300 gallons of fuel oil in any 3 hour period, which is intended as a limit on emissions, may be exceeded during startup, shutdown or malfunction in accordance with DER Rule 17-2.250, F.A.C.
Specific Condition 8 -	A revision is requested to incorporate the clarification provided by DER on October 26, 1989, with respect to the timing of measurements.
Specific Condition 13 -	U.S. Sugar has completed testing carbon monoxide (CO) emissions from Boiler No. 4 using EPA Method 10 and requests the establishment of a reasonable CO limit, as previously intended by DER. The proposed emission limit and the basis for the limit is provided.

Each of these items are discussed in the following paragraphs.

Specific Condition 5

This condition in the current permit requires that during any 3-hour period, not more than 6,300 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. This condition is included in the permit to limit SO_2 emissions. It is requested that this condition be revised to permit excess emissions resulting from startup, shutdown or malfunction, such as when power is lost at the mill. Startup conditions occur during the "grind-in" period (which usually occurs on one day approximately one week prior to the sugar mill startup), during startup of the sugar mill at the beginning of the crop season, and at other times when the mill has been shut down for an extended period (such as during the Christmas holidays). The purpose of the grind-in period is to test major equipment for proper operation. Plant emergencies are very rare, but when they do occur, bagasse feed to the boilers may be interrupted, and it may become necessary to switch to fuel oil.

Excess emissions during these limited and unusual periods are expressly allowed under DER Rule 17-2.250, F.A.C. The rule allows excess emissions from fossil fuel steam generators during such periods "provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions" is minimized. It is readily apparent that this rule was intended to cover precisely the type of situation encountered by U.S. Sugar during startups and other emergencies. Indeed, the rule would apply by its own terms if Specific Condition 5 were expressed as an emission limit rather than a fuel burning limit. Accordingly, we request that Specific Condition 5 be revised to read as follows:

5. During any 3-hour period, not more than 6,300 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. Excess fuel oil burning resulting from startup, shutdown, or malfunction of any source shall be permitted provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized. All permits to operate other oil burning equipment at this plant are revised to include this limitation.

Specific Condition 8

DER has clarified the intent of Specific Condition 8 of the current operating permit to require that the flue gas pressure drop across the scrubber be measured and recorded once in each 8-hour shift. Reference letter from Phillip R. Edwards, Deputy Assistant Secretary of DER, to Peter Barquin of U.S. Sugar Corporation, October 26, 1989 (copy enclosed). The letter states further that the pH of the scrubber water shall be measured and recorded once per day. We request that Specific Condition 8 of the permit be revised to reflect these modified requirements.

Specific Condition 13

Specific Condition 13 of the current permit limits CO emissions to 0.25 lb/MMBtu as determined by EPA Method 10. U.S. Sugar has addressed the concern with this condition in a letter addressed to DER dated October 8, 1990.

The concern with the condition is that the 0.25 lb/MMBtu limit was not based on Method 10 testing, but was based instead on EPA emission factors which have proven to be inappropriate as estimates of actual CO emissions from sugar processing mills. Subsequent testing at U.S. Sugar and other sugar mills has demonstrated that the 0.25 lb/MMBtu limit is much too low based on Method 10 testing, as acknowledged by the USEPA Region IV and the DER through correspondence in 1989.

Presented in the attached Table 1 are CO test results for the three mills known to have conducted Method 10 tests. A total of 20 individual test runs have been conducted on Boiler No. 4 at the U.S. Sugar mill in Clewiston. These were all conducted by Air Consulting and Engineering, Inc. Boiler No. 4 is a traveling grate boiler. The average CO emission rate for this boiler, as reflected in the test data, is 5.44 lb/MMBtu. The individual measurements range from 2.2 to 14.9 lb/MMBtu.

In order to determine an acceptable upper CO limit for compliance purposes, a statistical analysis of the test data was performed, using the average test results from each test date, consistent with the manner in which compliance tests are performed. The average test results are shown in Table 2. A frequency distribution for the data is presented in Figure 1. This plot shows that a CO emission level of 9.0 lb/MMBtu would have the probability of being exceeded only about 10 percent of the time. This probability of exceedance is acceptable to U.S. Sugar. Therefore, U.S. Sugar requests an allowable CO emission rate of 9.0 lb/MMBtu for Boiler No. 4.

Table 1. Summary of CO Emission Tests Performed on Bagasse Boilers in Florida Using EPA Method 10

Unit	Boiler Type	Date	Steam Rate (lb/hr)	Heat Input (MMBtu/hr)	Bagasse Firing Rate[a] (TPH wet)	CO Emissions lb/hr	CO Emissions lb/MMBtu	CO Emissions lb/ton,wet
U.S. Sugar Bryant								
Boiler 5	Vibrating Grate	02/16/89	256,928	577	80.14	2,586.9	4.48	32.28
Boiler 5	Vibrating Grate	02/17/89	249,228	561	77.92	2,658.0	4.74	34.11
Boiler 5	Vibrating Grate	02/17/89	249,480	562	78.06	1,693.3	3.01	21.69
						Max. =	4.74	34.11
						Avg. =	4.08	29.36
Osceola Farms								
Boiler 3	Fuel Cell	01/17/89	NA	NA	NA	NA	3.07	22.10
Boiler 3	Fuel Cell	12/05/89	NA	NA	NA	NA	0.81	5.83
Boiler 3	Fuel Cell	01/24/90	NA	NA	NA	NA	3.14	22.61
Boiler 6	Traveling Grate	01/16/89	NA	NA	NA	NA	5.42	39.02
Boiler 6	Traveling Grate	11/15/89	NA	NA	NA	NA	5.48	39.46
Boiler 6	Traveling Grate	02/02/90	NA	NA	NA	NA	5.93	42.70
						Max. =	5.93	42.70
						Avg. =	3.98	28.62
U.S. Sugar - Clewiston								
Boiler 4	Traveling Gate	02/20/90	308,636	691.7	96.07	1,940	2.80	20.19
Boiler 4	Traveling Gate	02/20/90	306,666	690.3	95.88	1,520	2.20	15.85
Boiler 4	Traveling Gate	02/20/90	310,298	698.8	97.06	2,240	3.20	23.08
Boiler 4	Traveling Gate	02/15/91	289,091	624.9	86.79	4,760	7.62	54.84
Boiler 4	Traveling Gate	02/15/91	291,200	629.5	87.43	2,710	4.30	31.00
Boiler 4	Traveling Gate	02/18/91	288,358	622.8	86.50	2,430	3.90	28.09
Boiler 4	Traveling Gate	02/18/91	285,224	616.4	85.61	2,640	4.28	30.84
Boiler 4	Traveling Gate	02/18/91	302,647	653.3	90.74	2,060	3.16	22.70
Boiler 4	Traveling Gate	02/19/91	290,769	627.9	87.21	4,430	7.05	50.80
Boiler 4	Traveling Gate	02/19/91	294,583	637.1	88.49	3,400	5.33	38.42
Boiler 4	Traveling Gate	02/19/91	293,382	633.5	87.99	2,480	3.92	28.19
Boiler 4	Traveling Gate	02/22/91	300,000	647.9	89.99	4,900	7.56	54.45
Boiler 4	Traveling Gate	02/22/91	293,382	634.2	88.08	9,450	14.90	107.28
Boiler 4	Traveling Gate	01/07/92	293,425	613.6	85.22	3,200	5.22	37.55
Boiler 4	Traveling Gate	01/07/92	282,800	591.3	82.13	6,270	10.60	76.35
Boiler 4	Traveling Gate	01/08/92	299,178	623.2	86.56	2,030	3.26	23.45
Boiler 4	Traveling Gate	01/08/92	297,973	621.5	86.32	3,160	5.09	36.61
Boiler 4	Traveling Gate	01/08/92	300,811	627.4	87.14	3,540	5.64	40.62
Boiler 4	Traveling Gate	01/09/92	302,055	630.0	87.50	2,770	4.40	31.66
Boiler 4	Traveling Gate	01/09/92	295,135	615.8	85.53	2,710	4.40	31.69
						Max. =	14.90	107.28
						Avg. =	5.44	39.18

Note: lb/hr = pounds per hour.
lb/MMBtu = pounds per million British thermal units.
lb/ton = pounds per ton.
MMBtu/hr = million British thermal units per hour.
NA = not available.
TPH = tons per hour.

[a] Calculated from reported heat input rate, assumed 3,600 Btu/lb average heat content for wet bagasse.

Table 2. Summary of CO Test Averages, U.S. Sugar Clewiston Boiler No. 4

Test Date	Number of Runs	Average CO Emissions (lb/MM Btu)
February 20, 1990	3	2.73
February 15, 1991	2	3.97
February 18, 1991	3	3.78
February 19, 1991	3	5.43
February 22, 1991	2	11.23
January 7, 1992	2	7.91
January 8, 1992	3	4.66
January 9, 1992	2	4.40

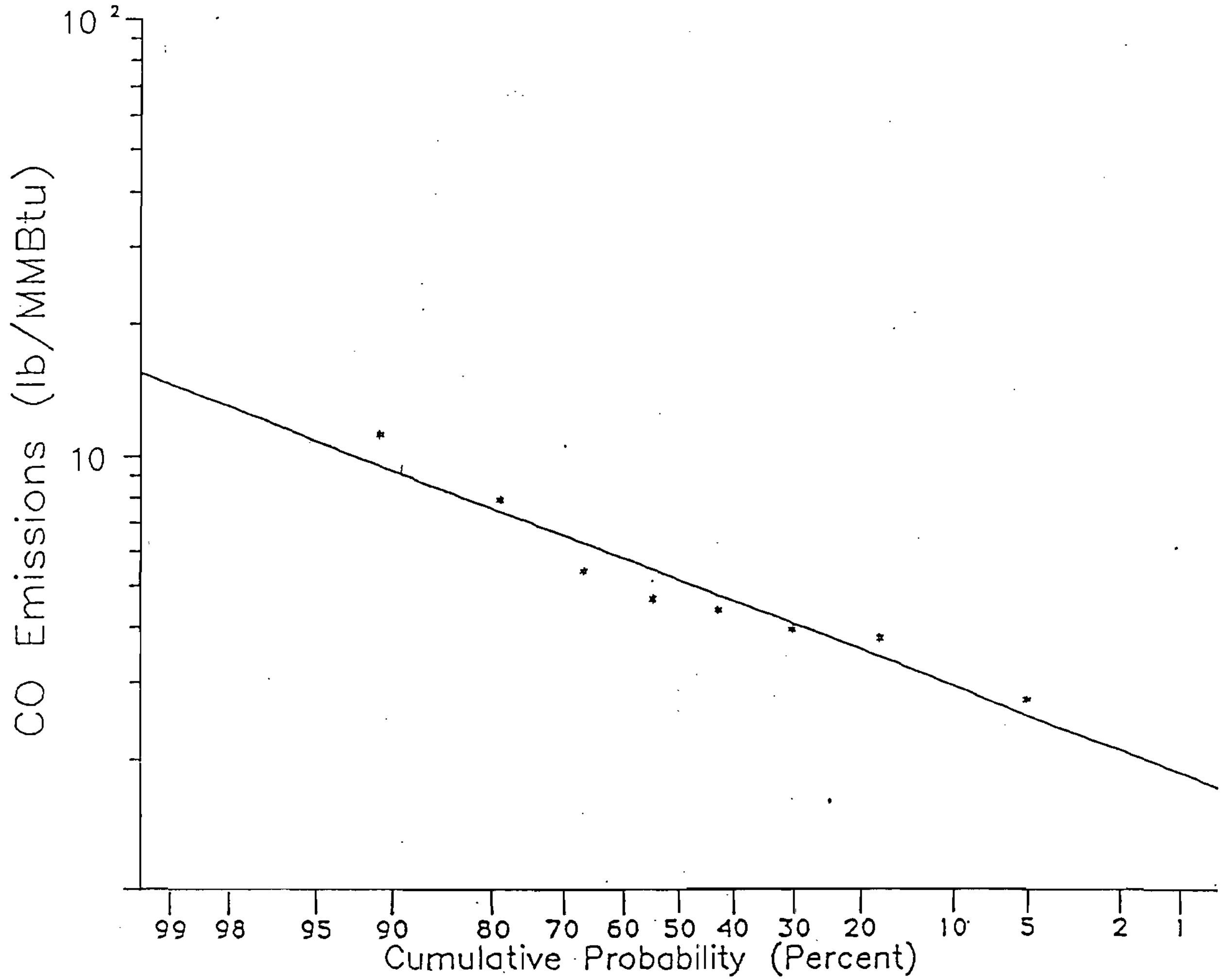


Figure 1 FREQUENCY DISTRIBUTION OF CO TEST DATA, CLEWISTON BOILER NO. 4

KBN

ATTACHMENT B

Application for Renewal of Permit to Operate

Boiler No. 4

U.S. Sugar Corporation - Clewiston Mill

No plant or process changes have been made. Modifications of pollution control equipment for Boiler No. 1 were completed as approved by the Department on July 24, 1992.

ATTACHMENT C

Application for Renewal of Permit to Operate

Boiler No. 4

U.S. Sugar Corporation - Clewiston Mill

Because the underlying assumptions about carbon monoxide emission rates have proven to be erroneous, we have not complied with Specific Condition 13 of the permit. The inappropriateness and inapplicability of this condition has been recognized and acknowledged by the Department in correspondence with U.S. Sugar. Reference the letter from Philip Edwards of DER to Peter Barquin of U.S. Sugar, dated October 26, 1989. Accordingly, U.S. Sugar has conducted testing pursuant to instructions from the Department to provide the basis for establishing reasonable CO emissions levels for this boiler. The results of that testing are included in Attachment A of this application, and U.S. Sugar is requesting a revision of Specific Condition 13.

In addition, it has not always been possible to complete testing in accordance with the dates specified in the specific conditions of this permit. On those occasions when testing would not be completed within the specified time period, U.S. Sugar has advised the Department of the specific date scheduled for testing and has obtained authorization to complete testing on the alternative date, allowing an opportunity for witnessing by the Department.

Florida Department of Environmental Regulation

South District • 2269 Bay Street • Fort Myers, Florida 33901-2896 • 813-332-2667

Bob Martinez, Governor
Dale Twachtmann, Secretary
John Shearer, Assistant Secretary
Philip Edwards, Deputy Assistant Secretary

October 26, 1989

Peter Barquin
U. S. Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

Re: Hendry County - AP
U. S. Sugar Corporation
Boiler No. 4
AC26-126965 and AO26-144701

Dear Mr. Barquin:

As requested in your recent telephone conversation with David Knowles, we hereby clarify the intent of the specific conditions of the operating permit AO26-144701 for boiler No. 4.

The intent of specific condition No. 8 is that the flue gas pressure drop across the scrubber be measured and recorded once in each 8 hour shift. The pH of the scrubber water shall be measured and recorded once per day.

We request that you test the CO emissions from Boiler #4 using EPA Method 10 during the 1989-1990 crop season. The purpose of the this test is to help us determine a reasonable CO emission factor for boilers of this type. Please notify this office in advance of the date and time of each test.

If you have any questions please call David Knowles.

Sincerely,

Philip G. Barbosa
for

Philip R. Edwards
Deputy Assistant Secretary

PRE/DMK/jsw

cc: Williard Hanks

UNITED STATES SUGAR CORPORATION
Post Office Drawer 1207 Clewiston, Florida 33440
Telephone: (813) 983-8121 Telex: 510-952-7753

October 8, 1990

Mr. David Knowles
Florida Department of Environmental
Regulation
2269 Bay Street
Fort Myers, Florida 33901-2896

RE: Hendry County - AP
U. S. Sugar Corporation
Clewiston Boiler No. 4
Permit AC26-126965 and
AO26-144701

Dear Mr. Knowles:

Following Mr. Philip R. Edward's request as per his letter of October 26, 1989, we are sending you Report No. 1376-A for CO Emissions from Boiler No. 4.

We would have wanted to make more tests in this boiler, but due to certain difficulties with the testing company and the early end of the crop due to the extensive freeze which we sustained last winter, we were unable to run a more adequate number of tests.

Results from these three (3) one (1) hour runs might not be representative of the actual range and average emissions from this boiler.

The purpose of this test as requested by Mr. Edwards is to help the Department determine a reasonable CO Emission Factor for boilers of this type. We suggest you consider and evaluate the results of the nine (9) runs carried out at our Bryant Boiler No. 5 as well, in making this determination.

Very truly yours,

UNITED STATES SUGAR CORPORATION

Peter Barquin
Administative Ass't. to
Senior Vice President
Sugar Houses

PB:jt
Enclosures

UNITED STATES SUGAR CORPORATION

Post Office Drawer 1207 Clewiston, Florida 33440
Telephone: (813) 983-8121 Telex: 510-952-7753

September 4, 1991

RECEIVED

SEP 09 1991

Division of Air
Resources Management

Mr. David Knowles
Florida Department of
Environmental Regulation
2269 Bay Street
Fort Myers, Fl. 33901-2896

RE: United States Sugar Corporation
Bryant Boiler #1 - Permit #A0-50-191891
Bryant Boiler #3 - Permit #A0-50-182890

Dear Mr. Knowles:

We are sending you enclosed two copies each of the seven compliance tests conducted by Air Consulting and Engineering, Inc. on boilers of reference while burning petroleum contaminated soils. You will note that four tests were conducted on Boiler No. 1 and three on Boiler No. 3, at rates of 0%, approximately 2% and 10%, contaminated soil.

We are attaching copy of the letter and other enclosures sent by our counsel, Mr. Parker Thomson, to Mr. C. H. Fancy dated June 13, 1991, explaining in detail the amended permits to authorize the burning of the contaminated soil at different rates, and our request for your permission to allow United States Sugar Corporation to burn soils up to 10% bagasse feed rate in our Bryant Sugar House boilers during the 1991-92 crop.

We are also attaching copy of the letter sent by Carol M. Browner, Secretary of D.E.R., to our Mr. A.R. Mayo, Senior Vice President, Sugar Houses dated July 22, 1991, accepting our request and amending the permits as requested.

Very truly yours,

UNITED STATES SUGAR CORPORATION

Peter Barquin
Administrative Assistant
to Senior Vice President
Sugar Houses

PB/dsp
Enclosures
cc: Mr. C. H. Fancy
Mr. Parker Thomson
Mr. A. R. Mayo
Mr. M. T. Brinson

cc: 61
604
19
28 Blr Permits

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

July 22, 1991

JUL 1991
RECEIVED

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
United States Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

Re: Amendment of Permits
Bryant Mill Boilers Nos. 1 and 3

The Department is in receipt of Mr. Parker Thomson's June 13, 1991, letter requesting the permits for bagasse/No. 6 oil fired boilers Nos. 1 and 3 at your Bryant mill be amended to authorize an increase in the amount of soils that can be burned in these boilers. This request is acceptable. Permit Nos. AO 50-191891/AC 50-2041A for boiler No. 1 and permit Nos. AO 50-182890/AC 50-2043A for boiler No. 3 are amended to authorize up to 6,000 cubic yards of soil from the mill's property that is contaminated with "virgin" fuels (No. 2 and No. 6 oils) and "on-spec" used oil (lubricants) to be burned in these boilers at a rate of up to 10% by weight of the bagasse feed rate (wet) through the 1992 season and up to 500 cubic yards per year during future seasons. The soil must comply with F.A.C. Chapter 17-775. The boilers must comply with all conditions of their permits (including emission limits for all pollutants), and F.A.C. Chapter 17-2, when burning the maximum amount of contaminated soil (10% of the bagasse feed rate). Annual compliance tests are to be conducted while soil is being burned in the boilers. The permittee must keep records of the analysis and quantity of soil burned each season for a minimum of 2 years.

A copy of this letter must be filed with the referenced permits and shall become a part of those permits.

Sincerely,

Carol M. Browner

Carol M. Browner
Secretary

CMB/plm

Attach: Mr. Parker Thomson's letter dated June 13, 1991.

c: David Knowles, S. Dist.
Parker Thomson, Attorney
Jim Stormer, PBCHD

THOMSON MURARO BOHRER & RAZOOK, P.A.
ATTORNEYS AT LAW
1700 AMERIFIRST BUILDING
ONE SOUTHEAST THIRD AVENUE
MIAMI, FLORIDA 33131

PARKER D. THOMSON

TELEPHONE
(305) 350-7200
TELECOPIER
(305) 374-1005

June 13, 1991

Mr. C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Regulation
Florida Dept. of Environmental Regulation
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399-2400

JUN 1991
RECEIVED
Clewiston Sugar House

United States Sugar Corporation
Boiler #1 - AO-50-191891*/AC-50-2041A
Boiler #2 - AO-50-191899*/AC-50-2042A
Boiler #3 - AO-50-182890/AC-50-2043A

Dear Mr. Fancy:

By letter dated February 5, 1991 from Carol M. Browner, Secretary of DER to Mr. A. R. Mayo, Vice President, United States Sugar Corporation ("USSC")(attached as Exhibit A) and letter dated March 6, 1991 from Philip R. Edwards, Deputy Assistant Secretary of DER to Mr. Mayo (attached as Exhibit B), the above permits were amended to authorize the burning of certain soils during the 1991 and 1992 seasons and subsequent seasons at USSC's Bryant Mill.

The letter from Secretary Browner dated February 5, 1991 permitted burning of contaminated soil at approximately 2% of the bagasse feed rate, and required the conducting of annual compliance tests. The letter from Mr. Edwards dated March 6, 1991 states that USSC "is permitted to burn petroleum contaminated soils up to 10% of the bagasse feed rate for the purpose of stack testing at this higher feed rate. The burning of petroleum contaminated soils at this higher rate is limited to the time required for stack testing and shall not exceed two days."

Boilers #1 and #3 were used for the burning of the contaminated soil. Boiler #2 was not used and USSC does not intend to use it in the future for burning contaminated soils. Seven compliance tests in total were performed on these two boilers by Air Consulting and Engineering, Inc., four being conducted on Boiler #1 and three on Boiler #3. We are enclosing a tabulation of these tests with the dates performed, percent soil burned, particulate matter and volatile organic compounds emitted, together

* Boiler #1 previous operating permit was AO-50-116610. This number appears in Carol Browner's letter of February 5, 1991 and in the Final Determination. The renewed permit became effective February 19, 1991. Boiler #2 previous operating permit was AO-50-116613.

with steam and bagasse rates (attached as Exhibit C). As you will notice, on the results of Boiler #1, two three-run tests were performed with 0% soil burned, with the results to be used as a standard for the other tests. The 2% burn test and the 10% burn test may then be compared to this standard. The particulate matter results show that neither the 2% burn or the 10% burn generated higher particulate matter than the 0% burns. The VOC results for Boiler #1 showed the 2% and the 10% burns did not generate higher emissions than the 0% burns. With respect to Boiler #3, one 0% burn was done for a standard. The results obtained from the tests made on Boiler #3 at 2% and 10% soil burns also showed no greater particulate matter or VOC than the 0% burn.

USSC concludes on review and interpretation of these emission results, that the amount of "contamination" in the soil is so low that no significant variance occurred in the emissions for particulate matter or VOC's and that the scattered results are due to the variability of bagasse combustion.

As specified in Secretary Browner's letter of February 5, 1991, the quantity of soil burned during the 1990-91 seasons was as follows:

Boiler #1: 368.66 Tons (389.3 cubic yards)	Boiler #3: 386.37 Tons (408.0 cubic yards)

The Amendment of Permits Evaluation dated December 19, 1990, requires the permittee to analyze the soil prior to treatment and prior to disposal to show that it is in compliance with the Bureau of Waste Cleanup regulations. Tests were conducted during the period when soils were burned and noted that all results were in compliance with the Bureau's standards.

Based on the test burn results enclosed, we feel there is virtually no impact on the emissions as a result of burning the soil. Therefore, we request your permission as soon as possible, to allow us to burn the soils up to a 10% bagasse feed rate, enabling us to plan for the upcoming 1991-92 crop which will begin in October, 1991.

Sincerely,

Parker Thomson

PDT:pc
enclosures
bcc: A.R. Mayo
Bubba Wade
Jim Cowart

Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400
Lawton Chiles, Governor
Carol M. Browner, Secretary

February 5, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
United States Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

Re: Amendment of the Bryant Mill Permits

The Department is in receipt of Mr. Parker Thomson's November 12, 1990, letter requesting the permits for the bagasse/No. 6 oil fired boilers Nos. 1, 2, and 3 at your Bryant mill be amended to authorize the burning of soils from this mill's property that are contaminated with "virgin" fuels (No. 2 and No. 6 oils) and "on-spec" used oil (lubricants) in these boilers. This request is acceptable, with conditions. Permit numbers AO 50-116610/AC 50-2041A, Boiler No. 1; AO 50-116613/AC 50-2042A, Boiler No. 2; and AO 50-182890/AC 50-2043A, Boiler No. 3 are amended to authorize the burning of a total of 6,000 cubic yards of petroleum ("virgin" fuels and "on-spec" used oils) contaminated soil through the 1991 and 1992 seasons and up to 500 cubic yards during future seasons. The soil must comply with Chapter 17-775, F.A.C. The boilers must comply with the permits (including emission limits for all pollutants), and Chapter 17-2, F.A.C., when burning the maximum amount of contaminated soil (estimated at 2% of the bagasse feed rate) in the boilers. Annual compliance tests are to be conducted while burning soils. The permittee must keep records of the analysis and quantity of soil burned each season.

A copy of this letter must be filed with the referenced permits and shall become a part of those permits.

Sincerely,

Carol M. Browner

Carol M. Browner, Secretary

CMB/plm

Attachment: Mr. Parker Thomson's letter dated November 12, 1990.
c: David Knowles, South Dist.
Parker Thomson, Attorney
Don Ehlenbeck, BWC
Jim Stormer, PBCHD

EXHIBIT A

Final Determination on
Amendment of Permits

United States Sugar Corporation
Palm Beach, County
Bryant, Florida

Sources	Permit Numbers
Boiler No. 1	AO 50-116610/AC 50-2041A
Boiler No. 2	AO 50-116613/AC 50-2042A
Boiler No. 3	AO 50-182890/AC 50-2043A

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

January 30, 1991

Final Determination on Permit Amendments

The Amendment of Permits Evaluation for the construction/operation permits that would allow contaminated soil to be burned in bagasse/No. 6 oil fired boiler Nos. 1, 2, and 3 at United States Sugar Corporation's Bryant Mill on U.S. Highway 98 in Bryant, Palm Beach County, Florida, was distributed on December 20, 1990. The Notice of Intent to Issue was published in The Palm Beach Post on January 2, 1991. Copies of the evaluation were available for public inspection at the Palm Beach County Health Department office in West Palm Beach and the Department offices in Fort Myers and Tallahassee.

The only comments received were from the permittee. In a letter dated January 16, 1991, United States Sugar Corporation requested permission to burn contaminated soil at a rate of up to 10% of the bagasse feed rate in these boilers, and to be allowed to burn the contaminated soil presently accumulated at the plant site in two seasons instead of the 1990-1991 season. The request to burn at the higher (10%) rate is still under consideration by the Department, and action will be taken on it at a future date.

The Department believes there will be no measurable increase in emissions when the contaminated soil is fed into the boiler at 2% of the bagasse feed rate. The permittee's request to burn the accumulated contaminated soil over two instead of one season is acceptable to the Department.

The final action of the Department will be to issue the permit amendments as proposed in the Evaluation.

Florida Department of Environmental Regulation

South District • 2269 Bay Street • Fort Myers, Florida 33901-2896

Lawton Chiles, Governor

Carol M. Browner, Secretary

March 6, 1991

Mr. A. R. Mayo
Vice President
U. S. Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

Re: Palm Beach County - AP
U. S. Sugar Corporation
Bryant Boilers 1, 2 & 3

Dear Mr. Mayo:

Please refer to letter from Carol M. Browner, Secretary dated February 5, 1991 regarding amendment of the Bryant Mill permits.

This letter amends permits A050-191891 and A050-191899 to permit the burning of petroleum contaminated soils in accordance with Ms. Browner's letter. In addition, U. S. Sugar is permitted to burn petroleum contaminated soils up to 10% of the bagasse feed rate for the purpose of stack testing at this higher feed rate. The burning of petroleum contaminated soils at this higher rate is limited to the time required for stack testing and shall not exceed two days.

All other permit conditions remain as issued.

Sincerely,

Philip R. Edwards
Deputy Assistant Secretary

PRE/DMK/jw

EXHIBIT B

SOIL REMEDIATION PROJECT

BRYANT SUGAR HOUSE

PM & VOC EMISSIONS

SOURCE TEST REPORTS

DATE	SOURCE		PARTICULATE MATTER		VOLATILE ORGANIC COMPOUNDS		STEAM RATE	BAGASSE RATE
			Lb/Hr.	LB/MM BTU	LB/Hr.	LB/MM BTU	PPH	Tons/Hr
3/11/91	No 1	0 %	50.80	0.164	470.46	1.534	160,263	44.77
3/12/91	No 1	2 %	39.96	0.122	123.11	0.377	167,114	46.61
3/13/91	No 1	10 %	45.47	0.155	430.04	1.478	151,344	42.34
3/14/91	No 1	0 %	44.88	0.160	610.94	2.157	145,518	40.68
3/15/91	No 3	2 %	52.27	0.184	657.43	2.326	146,447	40.88
3/25/91	No 3	0 %	80.26	0.286	726.26	2.575	145,302	40.30
3 [illegible]5/91	No 3	10 %	68.21	0.233	633.81	2.164	151,096	41.84

EXHIBIT C

Florida Department of Environmental Regulation
South District • 2269 Bay Street • Fort Myers, Florida 33901-2896 • 813-332-6975
Bob Martinez, Governor
Dale Twachtmann, Secretary
John Shearer, Assistant Secretary
Philip Edwards, Deputy Assistant Secretary

October 4, 1990

RECEIVED
OCT 8 1990
DER-BAQM

Mr. P. A. Carreno
Director of Mill & Refinery Operations
Okeelanta Corporation
Post Office Box 86
South Bay, Florida 33493

Re: Palm Beach County - AP
Okeelanta Corporation
Boiler No. 4
Permit No. AO50-169210

Dear Mr. Carreno:

In reference to the letter from C. H. Fancy, P.E., Chief of Bureau of Air Regulation, dated September 21, 1990, we have amended permit AO50-169210 as follows:

Change SPECIFIC CONDITIONS: paragraph 5 to

5. Steam production shall not exceed 90,000 lbs/hr of 350 psig and 650° F steam (24 Hour average).

All other conditions remain unchanged.

Sincerely,

Philip R. Edwards
Deputy Assistant Secretary

PRE/AEL/jsw

cc: Clair Fancy
A. J. Satyal

UNITED STATES SUGAR CORPORATION

STACK TEST FOR CARBON MONOXIDE EMISSIONS

BOILER NO. 5 - BRYANT

REPORT 1340-P

DECEMBER 21, 1989

Table of Contents

INTRODUCTION

United States Sugar Corporation operates a raw sugar mill located in Pahokee, Florida. On December 21, 1989, a test for Carbon Monoxide was performed on the exhaust stack servicing Boiler No. 5.

During the testing period, records of the boiler data were maintained by plant personnel and are presented in the Appendix.

The average carbon monoxide emissions during the testing period were 4.54 lbs./mm btu.

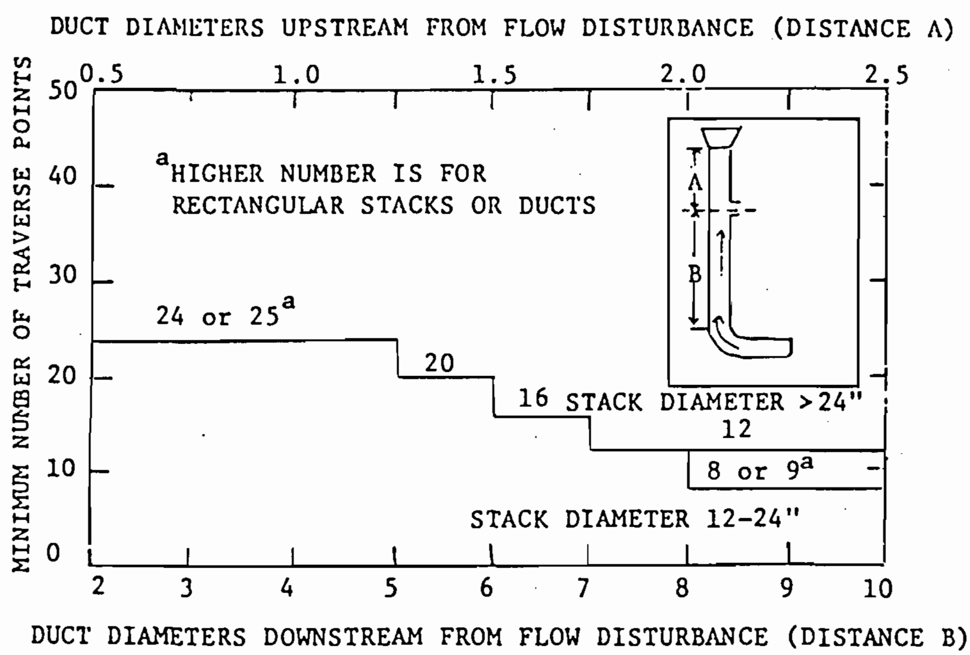
UNITED STATES SUGAR CORPORATION
BOILER NO. 5 - BRYANT
1340-P
DECEMBER 21, 1989

SUMMARY OF CARBON MONOXIDE EMISSIONS

RUN	TIME	CONCENTRATION (PPM)	VOLUMETRIC FLOW RATE (SCFM)	HEAT INPUT (MBTU)	EMISSION RATE (LBS/MBTU)
1	1005-1105	3055	142854	567.9	3.35
2	1219-1319	4367	151229	554.3	5.19
3	1437-1552	4458	142957	546.0	5.09
AVERAGE					4.54

UNITED STATES SUGAR CORPORATION
BOILER NO. 5
REPORT NUMBER 1340-S

	RUN 1	RUN 2	RUN 3
AREA (SQ.FT.)	41.28	41.28	41.28
SAMPLE VOLUME (CU.FT.)	38.31	40.47	38.76
WATER VAPOR (CU.FT.)	12.43	12.80	12.25
SAMPLE MOISTURE (%)	24.49	24.03	24.02
SATURATION MOISTURE (%)	23.81	24.59	24.66
MOLECULAR WEIGHT	27.14	27.12	27.12
VELOCITY (FPM)	5222	5555	5252
VOL.FLOW RATE (ACFM)	215558	229339	216802
VOL.FLOW RATE (SCFM-DRY)	142854	151229	142957



CIRCULAR STACKS

Number of points equal next higher multiple of four.

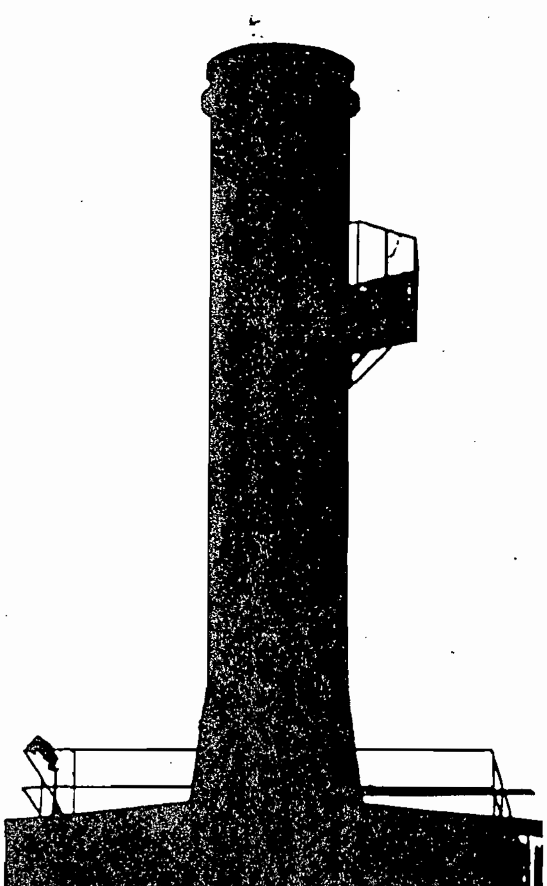
RECTANGULAR STACKS

Number Traverse Points	Subarea Layout Matrix
9	3 x 3
12	4 x 3
16	4 x 4
20	5 x 4
25	5 x 5
30	6 x 5
36	6 x 6
42	7 x 6
49	7 x 7

]SAMPLING POINT DETERMINATION
UNITED STATES SUGAR CORPORATION
BRYANT - BOILER NO. 5

STACK CONFIGURATION:	CIRCULAR
DIAMETER (INCHES):	87
DISTANCE A - PORT TO DOWNSTREAM DISTURBANCE (INCHES):	87
DISTANCE B - PORT TO UPSTREAM DISTURBANCE (INCHES):	349
NUMBER OF SAMPLING POINTS:	24
NUMBER OF TEST PORTS:	2
NUMBER OF POINTS ON A TRAVERSE:	12

POINT LOCATION ON A TRAVERSE:



TRAVERSE POINT NUMBER	INCHES TO STACK WALL
1	1.9
2	5.8
3	10.3
4	15.4
5	21.8
6	30.9
7	56.1
8	65.3
9	71.6
10	76.7
11	81.2
12	85.3

SUMMARY OF FIELD AND LABORATORY DATA
UNITED STATES SUGAR CORPORATION
BOILER NO. 5
REPORT NUMBER 1340-S

	RUN 1	RUN 2	RUN 3
DATE	12-21-89	12-21-89	12-21-89
START TIME	0958	1220	1438
STOP TIME	1105	1323	1543
CP FACTOR	.815	.815	.815
Y	.9937	.9937	.9937
Y/YI	1.0280	1.0280	1.0280
^HA	1.783	1.783	1.783
DIAMETER OF NOZZLE (IN.)	.1883	.1883	.1883
DIAMETER OF STACK (IN.)	87	87	87
NO. STACKS	1	1	1
STATIC PRES. (IN. H2O)	-.67	-.67	-.67
BAROMETRIC PRES. (IN. HG)	30.01	30.01	30.01
TEST TIME (MIN.)	60	60	60
METER VOLUME (CU.FT.)	39.36	42.09	40.49
SQ.RT.^P (IN.H2O)	1.445	1.535	1.451
ORFICE PRES. ^H (IN.H2O)	1.662	1.854	1.655
AVG.METER TEMP. (DEG.F)	82.6	89.6	91.7
AVG.STACK TEMP. (DEG.F)	147.6	148.9	149.0
WATER COLLECTED (MLS)	264.0	271.9	260.3
MOLECULAR WT. (DRY)	30.00	30.00	30.00
SATURATION MOISTURE (%)	23.81	24.59	24.66

Test Method

METHOD 10—DETERMINATION OF CARBON MONOXIDE EMISSIONS FROM STATIONARY SOURCES[3]

1. *Principle and Applicability.*

1.1 *Principle.* An integrated or continuous gas sample is extracted from a sampling point and analyzed for carbon monoxide (CO) content using a Luft-type nondispersive infrared analyzer (NDIR) or equivalent.

1.2 *Applicability.* This method is applicable for the determination of carbon monoxide emissions from stationary sources only when specified by the test procedures for determining compliance with new source performance standards. The test procedure will indicate whether a continuous or an integrated sample is to be used.

2. *Range and sensitivity.*

2.1 *Range.* 0 to 1,000 ppm.

2.2 *Sensitivity.* Minimum detectable concentration is 20 ppm for a 0 to 1,000 ppm span.

3. *Interferences.* Any substance having a strong absorption of infrared energy will interfere to some extent. For example, discrimination ratios for water (H_2O) and carbon dioxide (CO_2) are 3.5 percent H_2O per 7 ppm CO and 10 percent CO_2 per 10 ppm CO, respectively, for devices measuring in the 1,500 to 3,000 ppm range. For devices measuring in the 0 to 100 ppm range, interference ratios can be as high as 3.5 percent H_2O per 25 ppm CO and 10 percent CO_2 per 50 ppm CO. The use of silica gel and ascarite traps will alleviate the major interference problems. The measured gas volume must be corrected if these traps are used.

4. *Precision and accuracy.*

4.1 *Precision.* The precision of most NDIR analyzers is approximately ± 2 percent of span.

4.2 *Accuracy.* The accuracy of most NDIR analyzers is approximately ± 5 percent of span after calibration.

5. *Apparatus.*

5.1 *Continuous sample* (Figure 10–1).

5.1.1 *Probe.* Stainless steel or sheathed Pyrex[1] glass, equipped with a filter to remove particulate matter.

5.1.2 *Air-cooled condenser or equivalent.* To remove any excess moisture.

5.2 *Integrated sample* (Figure 10–2).

5.2.1 *Probe.* Stainless steel or sheathed Pyrex glass, equipped with a filter to remove particulate matter.

5.2.2 *Air-cooled condenser or equivalent.* To remove any excess moisture.

5.2.3 *Valve.* Needle valve, or equivalent, to adjust flow rate.

5.2.4 *Pump.* Leak-free diaphragm type, or equivalent, to transport gas.

5.2.5 *Rate meter.* Rotameter, or equivalent, to measure a flow range from 0 to 1.0 liter per min. (0.035 cfm).

5.2.6 *Flexible bag.* Tedlar, or equivalent, with a capacity of 60 to 90 liters (2 to 3 ft³). Leak-test the bag in the laboratory before using by evacuating bag with a pump followed by a dry gas meter. When evacuation is complete, there should be no flow through the meter.

5.2.7 *Pitot tube.* Type S, or equivalent, attached to the probe so that the sampling rate can be regulated proportional to the stack gas velocity when velocity is varying with the time or a sample traverse is conducted.

5.3 *Analysis* (Figure 10–3).

TABLE 10–1.—*Field data*

Location ______________________ Comments:
Test ______________________
Date ______________________
Operator ______________________

Clock time	*Rotameter setting, liters per minute (cubic feet per minute)*

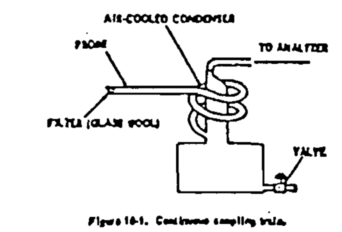


Figure 10-1. Continuous sampling train.

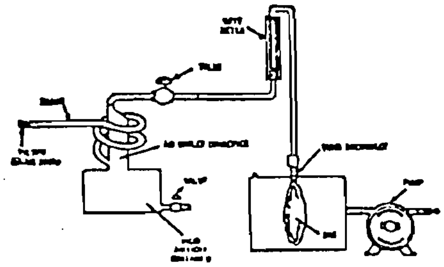


Figure 10-2. Integrated gas-sampling train.

5.3.1 *Carbon monoxide analyzer.* Nondispersive infrared spectrometer, or equivalent. This instrument should be demonstrated, preferably by the manufacturer, to meet or exceed manufacturer's specifications and those described in this method.

5.3.2 *Drying tube.* To contain approximately 200 g of silica gel.

5.3.3 *Calibration gas.* Refer to paragraph 6.1.

5.3.4 *Filter.* As recommended by NDIR manufacturer.

5.3.5 CO_2 *removal tube.* To contain approximately 500 g of ascarite.

5.3.6 *Ice water bath.* For ascarite and silica gel tubes.

5.3.7 *Valve.* Needle valve, or equivalent, to adjust flow rate

5.3.8 *Rate meter.* Rotameter or equivalent to measure gas flow rate of 0 to 1.0 liter per min. (0.035 cfm) through NDIR.

5.3.9 *Recorder (optional).* To provide permanent record of NDIR readings.

6. *Reagents.*

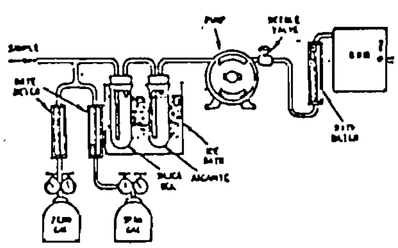


Figure 10-3. Analytical equipment.

6.1 *Calibration gases.* Known concentration of CO in nitrogen (N_2) for instrument span, prepurified grade of N_2 for zero, and two additional concentrations corresponding approximately to 60 percent and 30 percent span. The span concentration shall not exceed 1.5 times the applicable source performance standard. The calibration gases shall be certified by the manufacturer to be within ± 2 percent of the specified concentration.

6.2 *Silica gel.* Indicating type, 6 to 16 mesh, dried at 175° C (347° F) for 2 hours.

6.3 *Ascarite.* Commercially available.

7. *Procedure.*

7.1 *Sampling.*

7.1.1 *Continuous sampling.* Set up the equipment as shown in Figure 10–1 making sure all connections are leak free. Place the probe in the stack at a sampling point and purge the sampling line. Connect the analyzer and begin drawing sample into the analyzer. Allow 5 minutes for the system to stabilize, then record the analyzer reading as required by the test procedure. (See ¶ 7.2 and 8). CO_2 content of the gas may be determined by using the Method 3 integrated sample procedure (36 FR 24886), or by weighing the ascarite CO_2 removal tube and computing CO_2 concentration from the gas volume sampled and the weight gain of the tube.

7.1.2 *Integrated sampling.* Evacuate the flexible bag. Set up the equipment as shown in Figure 10–2 with the bag disconnected. Place the probe in the stack and purge the sampling line. Connect the bag, making sure that all connections are leak free. Sample at a rate proportional to the stack velocity. CO_2 content of the gas may be determined by using the Method 3 integrated sample procedures (36 FR 24886), or by weighing the ascarite CO_2 removal tube and computing CO_2 concentration from the gas volume sampled and the weight gain of the tube.

7.2 *CO Analysis.* Assemble the apparatus as shown in Figure 10–3, calibrate the instrument, and perform other required operations as described in paragraph 8. Purge analyzer with N_2 prior to introduction of each sample. Direct the sample stream through the instrument for the test period, recording the readings. Check the zero and span again after the test to assure that any drift or malfunction is detected. Record the sample data on Table 10–1.

8. *Calibration.* Assemble the apparatus according to Figure 10–3. Generally an instrument requires a warm-up period before stability is obtained. Follow the manufacturer's instructions for specific procedure. Allow a minimum time of one hour for warm-up. During this time check the sample conditioning apparatus, i.e., filter, condenser, drying tube, and CO_2 removal tube, to ensure that each component is in good operating condition. Zero and calibrate the instrument according to the manufacturer's procedures using, respectively, nitrogen and the calibration gases.

[1] Mention of trade names or specific products does not constitute endorsement by the Environmental Protection Agency.

9. *Calculation—Concentration of carbon monoxide.* Calculate the concentration of carbon monoxide in the stack using equation 10–1.

$$C_{CO_{stack}} = C_{CO_{NDIR}}(1 - F_{CO_2}) \qquad \text{equation 10–1}$$

where:

$C_{CO_{stack}}$ = concentration of CO in stack, ppm by volume (dry basis).

$C_{CO_{NDIR}}$ = concentration of CO measured by NDIR analyser, ppm by volume (dry basis). 6

F_{CO_2} = volume fraction of CO_2 in sample, i.e., percent CO_2 from Orsat analysis divided by 100.

10. *Bibliography.*

10.1 McElroy, Frank, The Intertech NDIR–CO Analyzer, Presented at 11th Methods Conference on Air Pollution, University of California, Berkeley, Calif., April 1, 1970.

10.2 Jacobs, M. B., et al., Continuous Determination of Carbon Monoxide and Hydrocarbons in Air by a Modified Infrared Analyzer, J. Air Pollution Control Association, 9(2):110–114, August 1959.

10.3 MSA LIRA Infrared Gas and Liquid Analyzer Instruction Book, Mine Safety Appliances Co., Technical Products Division, Pittsburgh, Pa.

10.4 Models 215A, 315A, and 415A Infrared Analyzers, Beckman Instruments, Inc., Beckman Instructions 1635–B, Fullerton, Calif., October 1967.

10.5 Continuous CO Monitoring System, Model A5611, Intertech Corp., Princeton, N.J.

10.6 UNOR Infrared Gas Analyzers, Bendix Corp., Ronceverte, West Virginia.

ADDENDA

A. Performance Specifications for NDIR Carbon Monoxide Analyzers.

Range (minimum)	0–1000ppm.
Output (minimum)	0–10mV.
Minimum detectable sensitivity	20 ppm.
Rise time, 90 percent (maximum)	30 seconds.
Fall time, 90 percent (maximum)	30 seconds.
Zero drift (maximum)	10% in 8 hours.
Span drift (maximum)	10% in 8 hours.
Precision (minimum)	± 2% of full scale.
Noise (maximum)	± 1% of full scale.
Linearity (maximum deviation)	2% of full scale.
Interference rejection ratio	CO_2—1000 to 1, H_2O—500 to 1.

B. *Definitions of Performance Specifications.*

Range—The minimum and maximum measurement limits.

Output—Electrical signal which is proportional to the measurement; intended for connection to readout or data processing devices. Usually expressed as millivolts or milliamps full scale at a given impedance.

Full scale—The maximum measuring limit for a given range.

Minimum detectable sensitivity—The smallest amount of input concentration that can be detected as the concentration approaches zero.

Accuracy—The degree of agreement between a measured value and the true value; usually expressed as ± percent of full scale.

Time to 90 percent response—The time interval from a step change in the input concentration at the instrument inlet to a reading of 90 percent of the ultimate recorded concentration.

Rise Time (90 percent)—The interval between initial response time and time to 90 percent response after a step increase in the inlet concentration.

Fall Time (90 percent)—The interval between initial response time and time to 90 percent response after a step decrease in the inlet concentration.

Zero Drift—The change in instrument output over a stated time period, usually 24 hours, of unadjusted continuous operation when the input concentration is zero; usually expressed as percent full scale.

Span Drift—The change in instrument output over a stated time period, usually 24 hours, of unadjusted continuous operation when the input concentration is a stated upscale value; usually expressed as percent full scale.

Precision—The degree of agreement between repeated measurements of the same concentration, expressed as the average deviation of the single results from the mean.

Noise—Spontaneous deviations from a mean output not caused by input concentration changes.

Linearity—The maximum deviation between an actual instrument reading and the reading predicted by a straight line drawn between upper and lower calibration points.

Field Data

FIELD DATA

PLANT Bryant
REPORT 1340-S-1
DATE 12-21-89
OPERATOR GPG
TIME 0958 — 1105
K FACTOR .74
ASSUMED MOISTURE % 23
DRY GAS METER NO. 4
NOZZLE ID NO. 3/16 A
WET BULB TEMP. —
POST LEAK CHECK .000 CFM @ 16"
Cp .815 (p-8)
Y .9937

Y/Y$_i$ 1.028
Δ Ha 1.783
Dn .1883
DIAMETER (in) 87
NO. DUCT 1
STATIC PRES. -.67
BAR. PRES. (in. Hg) 30.01
TEST TIME (min) 60
METERED VOL. 39.36
AVE. $\sqrt{\Delta p}$ 1.445
AVG. ΔH 1.662
AVG. METER TEMP. 82.6
AVG. STACK TEMP. 147.6

Boiler #5

TRAVERSE POINT NUMBER	SAMPLING TIME (min)	DRY GAS METER CU. FT.	VELOCITY HEAD (Δ p) in. H_2O	PRESSURE ORIFICE METER Δ H) in H_2O	DRY GAS TEMP. (°F)	PUMP VACUUM (in. Hg.)	IMPINGER (°F)	FILTER TEMP. (°F)	STACK TEMP. (°F)
	2.5	986.93							
1		990.00	3.50	2.59	81	8	50	226	143
2		991.25	4.20	3.11	81	10	48	226	148
3		993.69	5.00	3.70	81	12	49	250	149
4		996.25	5.00	3.70	81	13	50	250	150
5		998.66	3.90	2.89	81	11	52	265	150
6		001.00	2.40	1.78	81	9	54	268	150
7		002.14	2.00	1.48	81	8	55	264	149
8		003.43	1.30	.96	81	7	54	260	150
9		004.72	1.10	.81	81	7	53	262	149
10		005.80	1.00	.74	81	7	53	265	149
11		006.97	.98	.73	81	7	52	267	148
12		008.00	.89	.66	81	7	51	266	147
1		009.71	.93	.69	82	6	55	232	132
2		010.32	1.20	.89	82	7	50	258	146
3		011.61	1.30	.96	83	8	50	262	149
4		012.81	1.50	1.11	83	8	50	262	148
5		014.95	1.40	1.04	83	9	50	259	149
6		015.60	1.60	1.18	84	9	50	258	148
7		017.05	2.00	1.48	84	10	51	258	147
8		018.80	2.00	1.48	84	10	51	257	148
9		021.12	2.50	1.85	85	12	51	257	148
10		022.45	2.50	1.85	86	13	53	256	148
11		024.23	2.70	2.00	87	14	54	255	149
12		026.29	3.00	2.22	87	15	54	256	149

FIELD DATA

PLANT Bryant
REPORT 1340-S-2
DATE 12-21-89
OPERATOR GPG
TIME 1220 – 1323
K FACTOR .73
ASSUMED MOISTURE % 24
DRY GAS METER NO. 4
NOZZLE ID NO. 3/16A
WET BULB TEMP. ——
POST LEAK CHECK .000 CFM @ 25"
Cp .815 (p-8)
Y .9937

Y/Y_i 1.028
Δ Ha 1.783
Dn .1883
DIAMETER (in) 87
NO. DUCT 1
STATIC PRES. -.67
BAR. PRES. (in. Hg) 30.01
TEST TIME (min) 60
METERED VOL. 42.09
AVE. $\sqrt{\Delta p}$ 1.535
AVG. Δ H 1.854
AVG. METER TEMP. 89.6
AVG. STACK TEMP. 148.9

Boiler #5

TRAVERSE POINT NUMBER	SAMPLING TIME (min)	DRY GAS METER CU. FT.	VELOCITY HEAD (Δ p) in. H_2O	PRESSURE ORIFICE METER Δ H) in H_2O	DRY GAS TEMP. (°F)	PUMP VACUUM (in. Hg.)	IMPINGER (°F)	FILTER TEMP. (°F)	STACK TEMP. (°F)
		026.38							
1	2.5	028.41	3.20	2.34	88	8	56	227	149
2		031.81	5.20	3.80	88	12	47	245	151
3		033.21	5.90	4.31	88	12	48	265	151
4		036.01	5.20	3.80	88	16	51	264	150
5		038.84	4.40	3.21	88	15	52	265	149
6		040.71	2.70	1.97	88	12	53	265	150
7		042.15	1.50	1.10	89	9	52	264	150
8		043.61	1.40	1.02	89	9	52	264	150
9		045.42	1.10	.80	89	9	52	264	151
10		046.00	.98	.72	88	9	51	249	149
11		046.02	.88	.64	88	9	50	249	149
12		048.10	.88	.64	88	9	50	249	149
1		050.11	1.30	.95	89	10	51	230	144
2		050.91	1.60	1.17	89	11	48	253	148
3		052.32	1.50	1.10	89	11	48	256	148
4		054.24	2.00	1.46	90	12	49	256	149
5		055.51	1.90	1.39	90	13	48	255	149
6		057.10	2.00	1.46	91	13	49	253	148
7		058.42	2.50	1.83	91	13	49	251	148
8		060.86	2.50	1.83	91	15	49	251	148
9		062.75	3.10	2.26	92	16	50	253	148
10		064.55	3.40	2.48	93	19	51	254	148
11		066.45	2.90	2.12	93	20	52	256	148
12		068.47	2.90	2.12	93	20	54	257	149

FIELD DATA

PLANT Bryant
REPORT 1340-S-~~2~~3
DATE 12-21-89
OPERATOR GPJ
TIME 1438 - 1543
K FACTOR .73
ASSUMED MOISTURE % 24
DRY GAS METER NO. 4
NOZZLE ID NO. 3/16 A
WET BULB TEMP. ——
POST LEAK CHECK .000 cfm @ 15"
Cp .815 (p-8)
Y .9937

Y/Y$_i$ 1.028
ΔHa 1.783
Dn .1883
DIAMETER (in) 87
NO. DUCT 1
STATIC PRES. -.67
BAR. PRES. (in. Hg) 30.01
TEST TIME (min) 60
METERED VOL. 40.49
AVE. $\sqrt{\Delta p}$ 1.451
AVG. ΔH 1.655
AVG. METER TEMP. 91.4
AVG. STACK TEMP. 149.0

Boiler # 5

TRAVERSE POINT NUMBER	SAMPLING TIME (min)	DRY GAS METER CU. FT.	VELOCITY HEAD (Δp) in. H_2O	PRESSURE ORIFICE METER (ΔH) in H_2O	DRY GAS TEMP. (°F)	PUMP VACUUM (in. Hg.)	IMPINGER (°F)	FILTER TEMP. (°F)	STACK TEMP. (°F)
		068.68							
1	2.5	070.76	3.80	2.77	91	11	49	227	148
2		072.99	4.00	2.92	91	12	47	255	150
3		075.65	5.50	4.02	91	17	51	265	150
4		078.23	4.90	3.58	91	17	55	265	150
5		081.35	4.00	2.92	91	17	57	266	150
6		082.90	2.50	1.83	91	12	57	268	149
7		084.21	1.30	.95	91	12	56	268	149
8		085.42	1.10	.80	91	8	55	266	150
9		086.65	1.00	.73	91	8	53	265	150
10		087.71	.95	.69	90	8	52	263	148
11		088.92	1.00	.73	90	9	51	262	149
12		090.00	.87	.64	90	9	50	260	149
1		091.83	1.20	.88	91	9	51	240	145
2		092.55	1.50	1.10	92	10	49	252	149
3		094.02	1.60	1.17	92	11	49	251	149
4		095.42	1.50	1.10	92	11	50	248	149
5		096.84	1.50	1.10	92	11	51	249	148
6		098.38	2.00	1.46	92	13	50	242	149
7		100.93	2.20	1.61	92	13	51	239	150
8		102.30	2.20	1.61	93	15	51	245	150
9		104.12	2.90	2.12	93	15	52	249	149
10		105.42	2.50	1.83	94	17	52	255	149
11		107.56	2.70	1.97	94	18	54	258	149
12		109.17	1.70	1.24	94	15	55	257	149

Emission Summary

EMISSION SUMMARY

FACILITY: U. S. SUGAR - BRYANT
SOURCE: NO. 5. BOILER
DATE: 12-21-89

PAGE ____ OF ____

Run 1

TIME	ppm CO ~~MAXIMUM~~ 10000 RANGE	MINIMUM	AVERAGE
1005 - 1010	≈ 2500		
1010 - 1015	≈ 4000		
1015 - 1020	≈ 4000		
1020 - 1025	≈ 3300		
1025 - 1030	≈ 2300		
1030 - 1035	≈ 3300		
1035 - 1040	≈ 2800		
1040 - 1045	≈ 3400		
1045 - 1050	≈ 3200		
1050 - 1055	≈ 3000		
1055 - 1100	≈ 2900		
1100 - 1105	≈ 3600		
HOURLY AVERAGE	3055		
(INTEGRATED)			

EMISSION SUMMARY

FACILITY: U.S. SUGAR - BRYANT

SOURCE: NO. 5 BOILER

DATE: 12-21-89

PAGE ____ OF ____

RUN 2

TIME	10000 RANGE CO ppm		
1219-1224	≈6000		
1224-1229	≈6000		
1229-1234	≈4600		
1234-1239	≈5500		
1239-1244	≈4800		
1244-1249	≈4800		
1249-1254	≈5500		
1254-1259	≈4900		
1259-1304	≈4500		
1304-1309	≈3800		
1309-1314	≈3900		
1314-1319	≈4000		
HOURLY AVERAGE	4367		
(INTEGRATED)			

EMISSION SUMMARY

FACILITY: U.S. SUGAR
SOURCE: No. 5. BOILER
DATE: 12-21-89

PAGE ____ OF ____

RUN 3

TIME	10000 RANGE ppm CO		
1437-1442	≈ 4800		
1442-1447	≈ 3800		
1447-1452	≈ 3700		
1452-1457	≈ 4800		
1457-1502	≈ 5000		
1502-1507	≈ 4600		
1507-1512	≈ 5000		
1512-1517	≈ 4700		
1517-1522	≈ 4600		
1537-1542	≈ 4800		
1542-1547	≈ 3900		
1547-1552	≈ 3800		
AVERAGES	4458		
(HOURLY INTEGRATION)			

SAMPLE LINE KINK (NO DATA)

Allowable Emission Data

ALLOWABLE EMISSIONS

UNITED STATES SUGAR CORPORATION
BOILER NO. 5
RUN NUMBER 1340-S-1

BTU OF STEAM @ 900 F & 853 PSIA	1453.7 BTU/LB
BTU OF FEED WATER @ 338 F & 1215 PSIA	208.5 BTU/LB
NET BTU VALUE OF STEAM	1245.2 BTU/LB

INITIAL INTEGRATOR READING	3523	
FINAL INTEGRATOR READING	3609	
INTEGRATOR FACTOR	3500	
TOTAL TIME(MIN.)	72	
STEAM PRODUCTION RATE		250833.3 LB/HR
FURNACE EFFICENCY		55%

TOTAL HEAT INPUT	567.9 MBTU/HR
HEAT INPUT - OIL	0 MBTU/HR
HEAT INPUT - BAGASSE	567.9 MBTU/HR

ALLOWABLE EMISSIONS

UNITED STATES SUGAR CORPORATION
BOILER NO. 5
RUN NUMBER 1340-S-2

BTU OF STEAM @ 898 F & 832 PSIA	1452.6 BTU/LB
BTU OF FEED WATER @ 335 F & 1215 PSIA	205.5 BTU/LB
NET BTU VALUE OF STEAM	1247.1 BTU/LB

INITIAL INTEGRATOR READING	3689	
FINAL INTEGRATOR READING	3767	
INTEGRATOR FACTOR	3500	
TOTAL TIME(MIN.)	67	
STEAM PRODUCTION RATE		244477.6 LB/HR
FURNACE EFFICENCY		55%

TOTAL HEAT INPUT	554.3 MBTU/HR
HEAT INPUT - OIL	0 MBTU/HR
HEAT INPUT - BAGASSE	554.3 MBTU/HR

ALLOWABLE EMISSIONS

UNITED STATES SUGAR CORPORATION
BOILER NO. 5
RUN NUMBER 1340-S-3

BTU OF STEAM @ 900 F & 828 PSIA		1454.7 BTU/LB
BTU OF FEED WATER @ 333 F & 1215 PSIA		203.5 BTU/LB
NET BTU VALUE OF STEAM		1251.2 BTU/LB
INITIAL INTEGATOR READING	3846	
FINAL INTEGATOR READING	3926	
INTEGATOR FACTOR	3500	
TOTAL TIME(MIN.)	70	
STEAM PRODUCTION RATE		240000 LB/HR
FURNACE EFFICENCY		55%
TOTAL HEAT INPUT		546 MBTU/HR
HEAT INPUT - OIL		0 MBTU/HR
HEAT INPUT - BAGASSE		546 MBTU/HR

Best Available Copy

BOILER DATA SHEET

COMPANY U.S. Sugar - Bryant

BOILER NUMBER 5

DATE 12-21-89

REPORT NO. 1340-S

INTEGRATOR FACTOR 3500

OIL METER FACTOR NA

			STEAM			FEED WATER	
TIME	INTEGRATOR	OIL METER	FLOW	TEMP.	PRESSURE	TEMP.	PRESSURE
9:55	2535[illegible]	0287[illegible]	[illegible]	900	860	340	[illegible]
10:10			257	900	850	3[illegible]	1200
10:25			247	900	840	340	1200
10:40			245	[illegible]	[illegible]	340	[illegible]
10:55			247	900	810	335	1200
11:07	253609	028[illegible]	251	900	840	335	1200
12:17	2536[illegible]	028749	252	900	840	335	1200
12:32			245	890	800	335	1200
12:47			247	900	810	335	1200
12:52			245	900	820	335	1200
1:17			245	900	820	335	1200
1:[illegible]4	253[illegible]67	028749	239	900	810	335	1200
[illegible]:34	253[illegible]46	028749	245	900	840	335	1200
2:49			245	900	800	335	1200
3:04			245	100	820	335	1200
3:19			[illegible]	900	820	330	1200
3:34			244	900	800	330	1200
[illegible]:44	2539[illegible]	028749	239	900	800	330	1200

SIGNED [illegible]

PROCESS DATA

COMPANY U.S. Sugar / Bryant INSTALLATION Boiler #5

DATE 12-21-89 REPORT NO. 1340-S

TYPE OF INSTALLATION Boiler

TYPE OF MATERIAL PROCESSED Steam

TYPE(S) OF FUEL USED Bagasse

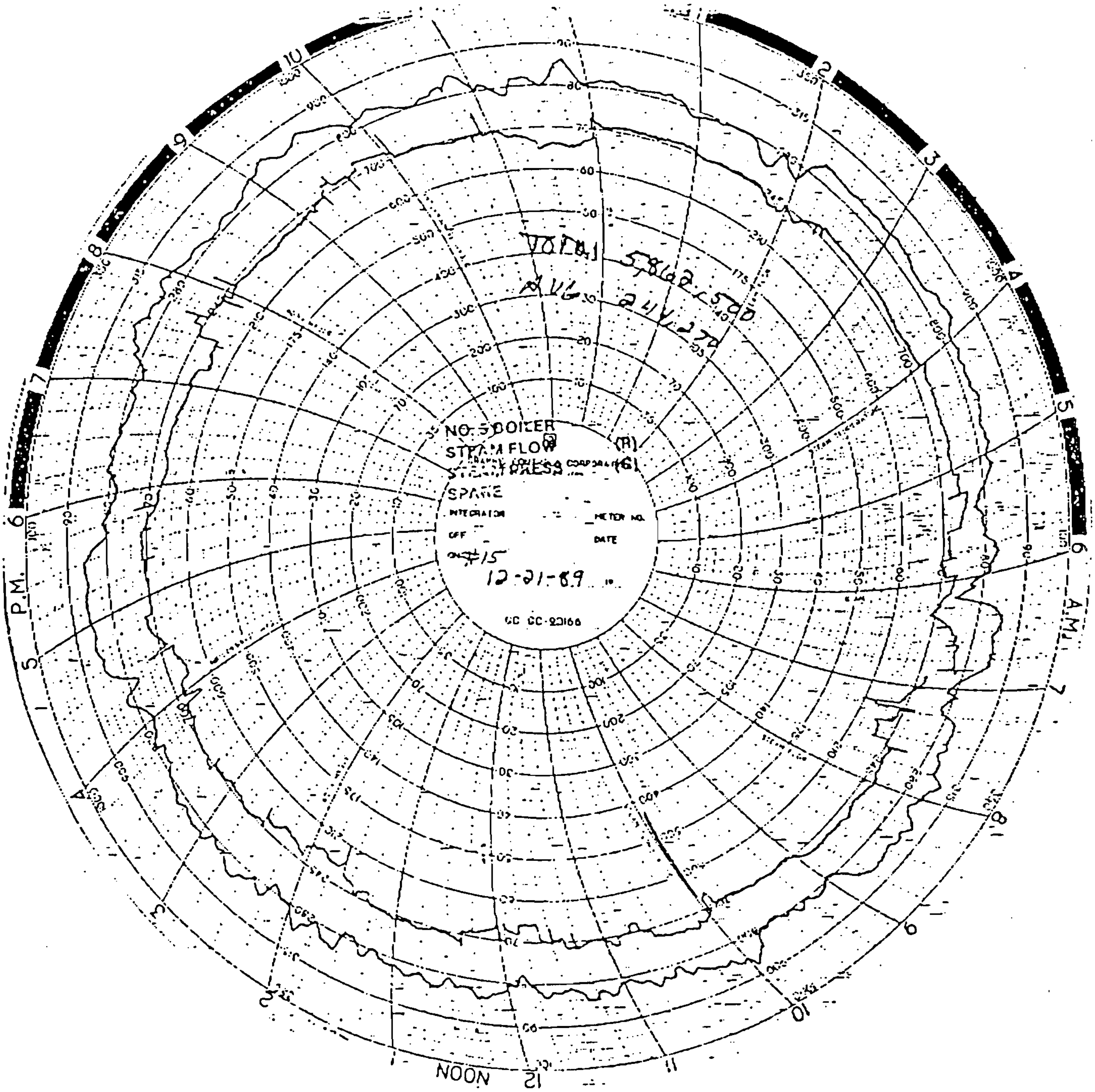
TYPE OF POLLUTION CONTROL SYSTEM wet scrubber w/Demister

GENERAL CONDITION OF CONTROL EQUIPMENT normal

	NORMAL	RUN 1	RUN 2	RUN 3
FUEL USED		Bagasse		
SCRUBBER WATER FLOW RATE				
PRESSURE DROP (INCHES)	8-8.5	8-8.5	8-8.5	8-8.5
TOTAL OPERATING CURRENT	NA	NA	NA	NA
MATERIALS PROCESSED	- steam - see Attached			

COMPANY REPRESENTATIVE [signature]

TITLE


NO. 5 BOILER
STEAM FLOW (R)
STEAM PRESS (G)
SPARE
INTEGRATOR
METER NO.
OFF
DATE
ON #15
12-21-69
CC CC-20166
Total 578622500
AVG 241092
P.M.
A.M.
NOON 12

Calibration Data (Meter 4)

CALIBRATION DATA

August 24, 1989

Meter No. 4
Barometric Pressure 29.88

ˆ H	0.1	0.3	0.5	1.0	2.0	4.0	8.0
CFw	2.50	2.50	5.00	5.00	10.00	10.00	10.00
CFd	2.46	2.50	5.08	5.09	10.18	10.06	9.85
Tw	90	88	87	87	87	89	89
Td	91	89	90	88	89	90	91
Time	13.66	7.85	12.25	8.80	12.64	8.84	6.29
Y	1.0179	1.0011	.9884	.9817	.9811	.9861	.9993
ˆ Ha	1.7389	1.7165	1.7322	1.7943	1.8476	1.8173	1.8368

Average ˆHa = 1.7834 Average Y = .9937

Thermocouple Calibrations

	TC-4	TC-5	ASTM
Ice	32	32	32
Boiling Water	212	212	212
Oil	399	399	399

Barometer Calibration

Aneroid - 29.88 Hg - 29.88

Pitot No. 8

	1	2	3
Std.	.29	.30	.31
Side A	.42	.44	.46
Side B	.42	.44	.48
CPs	.823	.817	.805
Deviation	.008	.002	.010

Average CPs = .815

Nozzle Calibration

Date December 21, 1989 3/16A = .188, 188, 189, 188 = .1883

CONTINUOUS MONITOR ACCURACY CERTIFICATION

PLANT: U.S. Sugar
LOCATION: Bryant
SOURCE ID: No. 5 Boiler
DATE: 12-21-89

NO_x

Calibration Gas	Monitor Value ppm	Difference ppm	% Span

O_2

Calibration Gas	Monitor Value %	Difference %	% Span

10 000 Range

CO

Calibration Gas	Monitor Value	Difference	% Span
5992	5900		
3017	2900		
Zero	0		
	1000 Range		
	C_3H_8		
84.5	84.5		
50.2	46.0		
29.5	29.0		
Zero	0		

Project Participants

SOUTH FLORIDA ENVIRONMENTAL SERVICES, INC.

William D. Arlington	Project Director
Gerard Gauthreaux	Field Technician
Ronald Stocks	Field Assistant

AIR CONSULTING AND ENGINEERING, INC.

Steve Neck	Engineer

UNITED STATES SUGAR CORPORATION

Peter Barquin	Ass't to the Senior Vice President

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

February 15, 1988

A. R. Mayo, Senior Vice President, Sugar Houses
United States Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

RE: Hendry County - AP
U. S. Sugar Corporation
Boiler No. 4

Dear Mr. Mayo:

Enclosed is Permit Number AO26-144701 to operate a sugar processing plant, boiler Number 4, issued pursuant to Section(s) 403.087, Florida Statutes.

Persons whose substantial interests are affected by this permit have a right, pursuant to Section 120.57, Florida Statutes, to petition for an administrative determination (hearing) on it. The petition must conform to the requirements of Chapters 17-103 and 28-5.201, FAC, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee 32301, within fourteen (14) days of receipt of this notice. Failure to file a petition within the fourteen (14) days constitutes a waiver of any right such person has to an administrative determination (hearing) pursuant to Section 120.57, Florida Statutes. This permit is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with this paragraph or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, FAC. Upon timely filing of a petition or a request for an extension of time this permit will not be effective until further Order of the Department.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of

Continued . . . .

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

	Initial / Date
1. ~~TO:~~ (NAME, OFFICE, LOCATION) CLAIR FANCY, BAQM	Initial Date
2. DER	Initial Date
3. FEB 22	Initial Date
4. BAQM	Initial Date

REMARKS:

U.S. SUGAR CORP.

Boiler #4

A026-144701

INFORMATION

- Review & Return
- Review & File
- Initial & Forward

DISPOSITION

- Review & Respond
- Prepare Response
- For My Signature
- For Your Signature
- Let's Discuss
- Set Up Meeting
- Investigate & Report
- Initial & Forward
- Distribute
- Concurrence
- For Processing
- Initial & Return

FROM: JAMES ONI
FORT MYERS

DATE 2/18/88

PHONE SUNCOM 721-7900

Appeal must be filed within 30 days from the date the Final Order is filed with the Clerk of the Department.

Executed in Ft. Myers, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Philip R. Edwards

Philip R. Edwards
District Manager
2269 Bay Street
Ft. Myers, FL 33901-2896

PRE/OO/jsw

Copies furnished to:

David A. Buff, P.E.
DER - Tallahassee

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on Feb 18, 1988 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to S 120.52 Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Donna J. Johnson 2-18-88
CLERK DATE

Copied: Willard Hanks
CHF/BT
2.23.88

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTH FLORIDA DISTRICT
2269 BAY STREET
FORT MYERS, FLORIDA 33901-2896
(813)332-2667

BOB MARTINEZ
GOVERNOR
DALE TWACHTMANN
SECRETARY
PHILIP R. EDWARDS
DISTRICT MANAGER

PERMITTEE: A. R. Mayo, Senior Vice Pres.,
Sugar Houses
United States Sugar Corp.
Post Office Drawer 1207
Clewiston, Florida 33440

I.D. Number: 52/26/0003/09
Permit/Certification Number: AO26-144701
Date of Issue: February 15, 1988
Expiration Date: February 15, 1993
County: Hendry
Latitude/Longitude:
26° 44' 05"N
80° 56' 19"W
Section/Township/Range: 21 & 22/43S/34E
Project: U. S. Sugar Corporation
Boiler No. 4

This permit is issued under the provisions of Chapter(s) 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

Operate Boiler Number 4 with a steam production capacity of 314,757 lbs/hr for a 6-hour average and a maximum 1-hour average of 346,231 lbs/hr at 850 psig, 900°F. Steam production capacity at 600 psig, 750°F is 335,000 lbs/hr for a 6-hour average and 368,500 lbs/hr for a maximum 1-hour average. Boiler is fired with bagasse and No. 6 residual oil having a combined heat input of 706.6 million BTU per hour for a 6-hour average and a maximum 1-hour average of 777.2 million BTU per hour. Emissions are controlled by one (1) Joy Turbulaire Spray Impingement Scrubber, Type D, Size 200. The permit contains 15 General Conditions and 17 Specific Conditions.

Plant is located near the intersection of W. C. Owens Avenue and Clewiston Street, Clewiston, Florida.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefor caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.

GENERAL CONDITIONS:

7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.

GENERAL CONDITIONS:

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

- ( ) Determination of Best Available Control Technology (BACT)
- ( ) Determination of Prevention of Significant Deterioration (PSD)
- ( ) Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)
- ( ) Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon Request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

- __ the date, exact place, and time of sampling or measurements;
- __ the person responsible for performing the sampling or measurements;
- __ the date(s) analyses were performed;
- __ the person responsible for performing the analyses;
- __ the analytical techniques or methods used; and
- __ the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

PERMITTEE: U. S. Sugar Corporation

I.D. Number: 52/26/0003/09
Permit/Certification Number: AO26-144701
Date of Issue: February 15, 1988
Expiration Date: February 15, 1993

SPECIFIC CONDITIONS:

1. Steam production, steam pressure, steam temperature, heat input, and bagassee consumption shall not exceed the following:

Steam press.	Steam temp. °F	Avging. Time *	Steam Prod. lb/hr	Heat input 10^6 BTU/hr	Bagassee Consum. lbs/hr-wet
850	900	Max.	346,231	777.2	215,889
		6-hr avg.	314,757	706.6	196,264
600	750	Max.	368,500	777.2	215,889
		6-hr avg.	335,000	706.6	196,264

*Maximum is a 1 hour average.

2. Heat input from No. 6 residual oil shall not exceed 225 million BTU per hour which is approximately equivalent to 1,500 gallons per hour of oil and 150,000 pounds per hour of steam. The boiler shall be operated so that not more than two burners with two oil guns each (total of four oil guns) can be used with a total maximum capacity not to exceed the permitted oil input.

3. During any 12 month period, the maximum quantity of No. 6 residual oil burned in boiler No. 4 shall not exceed 500,000 gallons.

4. During any 24 hour period, not more than 40,800 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. All permits to operate other oil burning equipment at this plant are revised to include this limitation.

5. During any 3 hour period, not more than 6,300 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. All permits to operate other oil burning equipment at this plant are revised to include this limitation.

6. All stationary fuel oil burning equipment at the plant shall be equipped with integrating fuel oil flow meters or continuous recorders to measure the amount of fuel oil consumed by the equipment. Oil meter readings on all oil consuming equipment shall be read and logged at least once every three hours, unless oil consumption for the equipment is recorded continuously, and these records shall be kept for at least five years for Department inspection. Each meter shall be calibrated annually by a method approved by the Department.

SPECIFIC CONDITIONS:

7. A test shall be made on Boiler No. 4 to determine its actual thermal efficiency in accordance with the ASME short-form procedure each time the operating permit for this boiler is renewed. The test shall be done while the tubes are clean and within 14 days of the compliance test. A current report on the thermal efficiency test must be included with the application to operate this boiler.

8. The scrubber controlling the emissions from Boiler No. 4 which was built to Joy Manufacturing Company's specifications for their Turbulaire, Type D, Size 200 spray impingement scrubber shall be equipped with instruments to measure the gas pressure drop and pH of the scrubber water. Instruments to continuously record the scrubber water pressure and volumetric flow shall also be provided. During the first season of operation at the higher steam production rates, hourly readings of the gas pressure drop shall be taken and logged for each day that boiler No. 4 operates. The hourly data shall be converted into consecutive three hour averages. If any three hour average gas pressure drop falls more than ten percent below the average pressure drop recorded during the compliance test that showed compliance with the particulate matter standard, or any one hour reading is twenty-five percent below the average pressure drop recorded during the compliance test, the Department may also require the installation of an instrument to continuously measure and record the gas pressure drop.

Hourly readings of the pH of the scrubber water shall be taken and logged for each hour during which bagasse is burned in boiler No. 4 during its first 160 days of operation. The hourly data shall be converted into consecutive three hour averages. The Department will be notified if chemicals are used to adjust pH. If any three hour average pH value falls more than ten percent below the pH that existed during the compliance test for sulfur dioxide, the Department may require the installation of an instrument to continuously measure and record scrubber water pH.

During compliance testing, the scrubber parameters shall be measured and recorded at 15 minute intervals.

Records of the measurements required by this condition shall be obtained each day boiler No. 4 operates during the first 160 days and copies of the records transmitted to the South Florida District and Bureau of Air Quality Management at the end of the season(s).

After review of the first 160 days of data, the Bureau of Air Quality Management and the South Florida District will establish the scrubber parameters to be monitored and the frequency of monitoring. These requirements shall become a condition to any permit to operate issued to boiler No. 4. The records required by the permit to operate shall be kept for five years for agency inspection.

SPECIFIC CONDITIONS:

9. Particulate matter emissions from boiler No. 4 shall not exceed 0.150 lb/million BTU heat input for bagasse fuel or 0.10 lb/million BTU heat input for No. 6 residual oil fuel. In event that both fuels are burned concurrently, the allowable particulate matter emissions shall be prorated from the allowable standards for each fuel by their respective heat inputs. Compliance with the particulate matter standards shall be determined by EPA Reference Methods 1, 2, 3, 4 and 5 as described in 40 CFR 60, Appendix A. The compliance test results shall be calculated by assuming the thermal efficiency of boiler No. 4 is 55 percent, or any new method subsequently adopted by Department rule. For informational purposes only, the particulate matter emission rate shall also be calculated by utilizing both the F factor (for each compliance test) and the short term ASME boiler efficiency test results (once evety five years). Scrubber parameters listed in Specific Condition No. 8 shall be recoreded every 15 minutes or continuously during the compliance test.

All compliance tests shall be conducted while the boiler is operating within 10 percent of its maximum or permitted capacity, whichever is lower. Such tests shall be conducted once per year commencing before February 15th. Results shall be submitted to the Department within 45 days after testing. The South Florida District office shall be notified 15 days prior to any compliance test to allow witnessing.

10. Visible emissions from boiler No. 4 shall not exceed 20 percent opacity except that 40 percent opacity is allowed for 2 minutes during any hour. Compliance with the standard shall be determined by DER Method 9 as described in Chapter 17-2, FAC. The particulate matter emissions and visible emissions shall be determined concurrently. Under circumstances when this is not feasible, the company shall obtain prior approval from the South Florida District to conduct the tests at separate times. In such circumstances, the tests shall be conducted as close to each other as is feasible.

11. Any No. 6 residual fuel oil burned in this boiler shall contain no more than 2.50 percent sulfur and shall be replaced during the season in which it is burned with fuel oil containing no more that 1.50 percent sulfur. Compliance with this condition shall be determined from certified analysis of the replacement oil by ASTM Method D-129. Records of the quantity and analysis of fuel oil consumed in boiler No. 4 and invoices for the oil purchased shall be kept for a minimum of five years for regulatory agency inspection.

12. Sulfur dioxide emissions from boiler No. 4, while it is burning 100 percent bagasse fuel, shall not exceed 0.166 lb/million BTU heat input as determined by EPA Method 6 as described in 40 CFR 60, Appendix A. The compliance test results shall be calculated by assuming the thermal efficiency of Boiler No. 4 is 55 percent, or any new method subsequently adopted by Department rule. For informational purposes

SPECIFIC CONDITIONS:

only, the sulfur dioxide emission rate shall also be calculated by utilizing both the F factor (for each compliance test) and the short term ASME boiler efficiency test results (once every five years). Scrubber parameters listed in Specific Condition No. 8 shall be recorded every 15 minutes or continuously durng the compliance test.

The compliance test shall be conducted while the boiler is operating within 10 percent of its maximum or permitted capacity, whichever is lower. Such test shall be conducted prior to the expiration date of this permit and the result submitted with the application for renewal of permit. Annual tests may be required if Department inspections show a need for such tests. Results shall be submitted to the Department within 45 days after testing. The South Florida District office shall be notified 15 days prior to any compliance test to allow witnessing.

Sulfur dioxide emissions from boiler No. 4, while it is burning a mixture of oil and bagasse, shall not exceed 680 lb/hr.

13. Emissions of carbon monoxide and volatile organic compounds shll be maintained at the lowest possible level through the implementation of an Operation and Maintenance plan that is approved by the Department. Emissions of carbon monoxide shall not exceed 0.25 lb/million BTU as determined by EPA Method 10. Emissions of volatile organic compounds shall not exceed 1.7 lb/ton of wet bagasse as determined by EPA Method 25. These test methods are described in 40 CFR 60, Appendix A. Compliance test for these pollutants will not be required if the visible emissions from boiler No. 4 are below 20 percent opacity.

14. Visible emissions from the bagassee handling systems shall not exceed 10 percent opacity over any 6 minute period as measured by EPA Reference Method 9, provided, however, that this visible emissions limit shall not apply during periods of high winds (wind speed of 18 miles per hour or greater) if reasonable precautions (covered conveyors, windbreaks, and the height of drop points are minimized) to control fugitive emissions have been taken. The company shall maintain a meteorlogical instrument to record the wind speed at the plant which shall be located at its Research Center, about one mile north of the Clewiston Mill.

15. Nitrogen oxides emissions, expressed as NO_2, shall not exceed 192.4 lb/hr (max.) and 180.7 lb/hr (6 hr avg.) as determined by EPA Reference Method 7 described in 40 CFR 60, Appendix A. After the initial compliance test, the company may substitute an Operation and Maintenance plan that is approved by the Department that opitimized the NO_x emissions for the compliance tests specified in this specific condition if the initial Method 7 test show compliance.

16. Any permit to operate issued for Boiler No. 4 will limit operation to 160 days per season; require the scrubber to be operated at a six hour average pressure drop not less than 90 percent of the six hour average pressure drop that existed during the particulate matter test that showed compliance or not less than 75 percent of the average six hour pressure drop at any time; require, as a minimum, annual

PERMITTEE: U. S. Sugar Corporation

I.D. Number: 52/26/0003/09
Permit/Certification Number: AO26-144701
Date of Issue: February 15, 1988
Expiration Date: February 15, 1993

SPECIFIC CONDITIONS:

particulate matter and visisble emission tests; an annual operation report which will include the amount of oil burned at the plant to determine compliance with the limits on oil usage in this permit, and the sulfur content of the residual oil purchased for the season; and a monthly summary of the scrubber parameters listed in Specific Condition No. 8.

17. Stack sampling facilities provided by the owner shall be in accordance with the requirements of Chapter 17-2.700(4), Florida Administrative Code.

Issued this 15th day of February, 1988

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Philip R. Edwards

Philip R. Edwards
District Manager

PRE/OO/jsw

11 Pages Attached

PERMIT
AO26-144701
00
Feb. 15, 1988

DER-Tallahassee

RECEIVED
JAN 29 1988
D. E. P. SO. FLA. DISTRICT

6375
pd #500.00

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

AIR POLLUTION SOURCES
CERTIFICATE OF COMPLETION OF CONSTRUCTION*

PERMIT NO. AC26-126965 DATE: February 16, 1987

Company Name: U.S. Sugar Corporation County: Hendry

Source Identification(s): Clewiston Boiler No. 4

Actual costs of serving pollution control purpose: $ 300,000

Operating Rates: 314,757 lb/hr steam @ 850 psig, 900°F* / 335,000 lb/hr steam @ 600 psig, 750°F* Design Capacity: 300,000 lb/hr steam @ 875 psig, 900°F

Expected Normal 280,000 lb/hr steam @ 850 psig, 900°F / 300,000 lb/hr steam @ 600 psig, 750°F During Compliance Test 311,769 lb/hr steam @ 600 psig, 750°F

Date of Compliance Test: January 25, 1988 (Attach detailed test report)

Test Results:

Pollutant	Actual Discharge	Allowed Discharge
Particulate Matter	0.11 lb/10^6 Btu	0.15 lb/10^6 Btu bagasse
Visible emissions	<20%	20% opacity, except 40% opacity for 2 minutes per hour.

Date plant placed in operation: March 1985

This is to certify that, with the exception of deviations noted**, the construction of the project has been completed in accordance with the application to construct and Construction Permit No. AC26-126965 dated February 16, 1987.

A. Applicant:

A. R. Mayo, Senior Vice President
Name of Person Signing (Type)

A. R. Mayo
Signature of Owner or Authorized Representative and Title

Date: 1-28-88 Telephone: (813) 983-8121

B. Professional Engineer:

David A. Buff
Name of Person Signing (Type)

David A. Buff
Signature of Professional Engineer

KBN Engineering and Applied Sciences, Inc.
Company Name

Florida Registration No. 19011

Date: January 28, 1988

(Seal)

P.O. Box 14288, Gainesville, FL 32604
Mailing Address

(904) 375-8000
Telephone Number

*This form, satisfactorily completed, submitted in conjunction with an existing application to construct permit and payment of application processing fee will be accepted in lieu of an application to operate.

**As built, if not built as indicated include process flow sketch, plot plan sketch, and updates of applicable pages of application form.

* This is a dual pressure boiler. This boiler can operate at either condition with a heat input rate of 706.6 x 10^6 Btu/hr, 6-hour average, and at 777.2 x 10^6 Btu/hr, maximum 1-hour average, equivalent to 346,231 lb/hr steam at the higher pressure condition, and at 368,500 lb/hr steam at 600 psig, 750°F.

DER Form 17-1.202(3) Effective November 30, 1982

Best Available Copy

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

IN RE:	)	Permit No. AO 26-115292
REQUEST FOR EMERGENCY PERMIT MODIFICATION BY UNITED STATES SUGAR CORPORATION CLEWISTON MILL BOILER NO. 4 PERMIT NO. AO 26-115292	)	

DER
DEC 15 1986
BAQM

FINAL ORDER

BY THE DEPARTMENT:

On December 10, 1986, the Department received a request from Mr. R. A. Mayo, Senior Vice President of U.S. Sugar Corporation, for an emergency permit modificiation to allow U.S. Sugar Corporation to increase the permitted steam production of Clewiston Mill Boiler No. 4, due to a failure and incapacitation of Clewiston Mill Boiler No. 5 on December 10, 1986.

FINDINGS OF FACT

The incapacitation of Boiler No. 5 comes at the peak of the annual sugar cane processing season. U.S. Sugar Corporation estimates that approximately one week is needed to complete repairs to Boiler No. 5 in order that it may resume operation.

Due to the extemely short sugar cane processing season, U.S. Sugar Corporation will suffer severe economic injury if it cannot increase the steam production of the Clewiston Mill Boiler No. 4.

The specific increased emissions which will result from the increase in steam production of Clewiston Mill Boiler No. 4 are specified as follows:

being two weeks
(thru 12/22/86)
See
Any problem? (I
don't

Pollutant	Present Emissions (lb/hr)	Temporary Emissions (lb/hr)	Increase (lb/hr)
Particulate Matter	90.0	116.6	26.6
Sulfur Dioxide	680.0	680.0	0
Nitrogen Oxides	136.8	192.4	55.6
Carbon Monoxide	150.0	194.3	44.3
Hydrocarbon	141.7	183.5	41.8

The increased emissions from Clewiston Mill Boiler No. 4 are reasonably expected to cause no significant net emissions increase of any air pollutant or violate any ambient air quality standard or PSD increment.

CONCLUSIONS OF LAW

Based on the above-stated facts, the Department finds that the increase in steam production of the Clewiston Mill Boiler No. 4 will not cause or contribute to pollution of the state's air in violation of any state standard or regulation. Therefore, pursuant to section 120.59(3), Florida Statutes, and Sections 17-2.200 and 17-2.250, F.A.C.,

IT IS ORDERED:

The U.S. Sugar Corporation, subject to the following conditions is hereby authorized to increase the steam production of the Clewiston Mill Boiler No. 4 to 370,000 pounds per hour through and including December 28, 1986. U.S. Sugar Corporation shall use best operational practices to minimize emissions from Boiler No. 4. This shall include increasing the scrubber water flow and pressure drop of the Joy "Turbulaire" spray impingement scrubber that serves Boiler No. 4.

Best Available Copy

DONE AND ORDERED this 11th day of December, 1986, in Tallahassee, Florida.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to S120.52 Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

C. Hutchinson 12-11-86
Clerk Date

Victoria Tschinkel
Secretary

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Telephone: (904) 488-4805

UNITED STATES SUGAR CORPORATION
Post Office Drawer 1207 Clewiston, Florida 33440
Telephone: (813) 983-8121 Telex: 510-952-7753

December 4, 1986

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301-8241

Dear Mr. Fancy:

This is in response to your letter dated November 24, 1986 regarding our application for permit modification submitted to you on October 28, 1986 for our Boiler No. 4 at our Clewiston mill.

The following are the replies to the questions asked in your letter:

1. U. S. Sugar wishes to increase the steam production from boiler #4 to provide increased evaporation capabilities for our process. The additional steam will be utilized for either a modest increase in capacity or increased sugar recovery efficiency or both.

It is also of significant importance to U. S. Sugar to have this boiler permitted at a production level that cannot easily be exceeded since bagasse is a fuel of quite variable combustion characteristics and an operator oversight might result in an event of non-compliance which this company wishes to avoid.

2. We are attaching a copy of the compliance test report conducted by South Florida Environmental Services, Inc. which includes scrubber parameters during tests for particulate matter, carbon monoxide, sulfur dioxide, nitrogen oxides and VOC. This report includes F Factor calculations, a Short Form ASME Efficiency Determination and fuel analysis made by Riley Stoker Corporation.

3. There was no visible emission test conducted for the bagasse handling system during the compliance test on December 23, 1985, however, an inspection was made by Mr. Mirza Baig on January 20, 1986 during very windy, gusty conditions. According to his report the 10% opacity limit was exceeded and a citation was issued for this apparent violation. Subsequently a Consent Order draft was sent to U. S. Sugar by the South Florida District office for our review. The revised form of this draft was returned to your Fort Myers office on November 13, 1986 for final processing. It is our understanding that DER finds no significant objection to the revised proposed version and therefore we expect an early resolution of this matter.

Precautions taken to minimize fugitive emissions from the system are:

a) The point of discharge of the backfeed elevator to the belt conveyor as well as the belt conveyor for a distance of 25 ft. to each side of this point was enclosed and extended curtains from the elevator down to near ground level were added to direct any spills to the ground in a way which shields it from the effects of the wind.

b) A 25 to 30 ft. high levy of bagasse was built around the discharge end of field belt conveyor in a 270 degree arc to serve as a wind shield. In effect the discharge end of this conveyor is in a crater like enclosure to shield it from winds.

c) An enclosure of approximately 20 ft. height closed at the top and three sides was built over the receiving hopper, where bagasse from the pile is discharged by the payloader for backfeed to the boilers, to contain the dust generated by this operation.

d) Replaced the 36 in. wide belt of the 500 ft. long field belt conveyor with a new belt 42 in. wide to keep the bagasse being conveyed from occasionally spilling over the sides.

e) Installed automatic retractable loading skirts with suitable seals on the reversible 500 ft. belt conveyor so that the bagasse remains separated from the edge of the belt by an adequate distance to prevent these spills.

f) Installed a hood over the field discharge end of the 500 ft. field belt conveyor and installed wind-shield curtains at each side of the conveyor at this point. A cover was put over the discharge chute leading to the ground.

g) The plowing of bagasse from the 500 ft. field belt conveyor to feed the bagasse silage plant has been permanently discontinued and a separate conveyor may be installed in the future for this purpose if the plant operates again.

h) The bottom or discharge end of the discharge chute at the field end of the belt conveyor has been equipped with a split-sock or Roman-Skirt type spout which flares open around the apex of the bagasse pile to shield against wind when the material is discharged.

i) The top or load deck of the drag type bagasse elevator conveyor used for backfeed from the field to the mill and which discharges onto the 500 ft. belt conveyor when backfeeding is taking place has been equipped with extended sides and cover for its entire exposed length.

Answers to your questions 4, 5 and 6 have been prepared by our consultant, Mr. David Buff of KBN Engineering, who was the engineer on record for the preparation of the application and therefore responsible for the calculations in question. See attached pages 4a and 4b for Mr. Buff's reply. We would appreciate your referring any questions you may have on these last three items directly to Mr. Buff so as to help expedite the processing of this application.

We wish to thank you for the attention you have given this application and for the assistance from your Mr. Willard Hanks in the matters addressed in your letter.

Very truly yours,

UNITED STATES SUGAR CORPORATION

A. R. Mayo

A. R. Mayo
Senior Vice President, Sugar Houses

ARM:jt
Enclosures: 3

cc: Mr. David Knowles
Mr. David Buff
Mr. Peter Cunningham

RESPONSE TO FDER LETTER DATED
November 24, 1986

4. The calculated 588 lb/hr SO_2 emission rate from oil burning is based upon the AP-42 factor for oil burning of 157S lb/1000 gals (Table 1.3.1 of AP-42). The factor inherently accounts for an approximate 95% conversion of fuel sulfur to SO_2, based upon actual field data (see Section 1.3.2 of AP-42). This probably accounts for the somewhat higher figure of 614 lb/hr SO_2 which DER has calculated based upon a mass balance. However, the AP-42 factor was used in the original Boiler No. 4 permit application, and was accepted by DER at that time. It is considered to be the most appropriate factor to use for Boiler No. 4.

5. In response to the first question posed by DER, the actual SO_2 emissions due to bagasse burning will not be different when burning either bagasse alone or bagasse in combination with fuel oil. However, allowable SO_2 emissions due to bagasse firing will be different in order not to increase SO_2 emissions above currently permitted levels. In order to demonstrate compliance with the SO_2 emission limits for bagasse burning, it is proposed to initially conduct an SO_2 test while burning 100% bagasse (this represents normal testing conditions). If this test shows emissions to be less than 0.166 lb/MMBtu, this would demonstrate compliance with the emission limits for both fuel burning scenarios. If this test results in emissions of greater than 0.166 lb/MMBtu, then an additional SO_2 test while burning bagasse/oil will be conducted to demonstrate compliance with the emission limit when burning bagasse/oil in combination.

6. According to AP-42, Table 1.3-1, the correct NO_x emission factor for fuel oil burning for boilers which have a heat input rate of greater than 100 MMBtu/hr is 67 lb/1000 gals. The factor of 55 lb/1000 gals cited by DER is for boilers with a heat input rate of between 10 and 100 MMBtu/hr. The Boiler No. 4 maximum heat input rate of 777.2 MMBtu/hr exceeds the 100 MMBtu/hr upper limit for the boiler category of Table 1.3-1.

Additional Responses to Mr. Linn's Questions

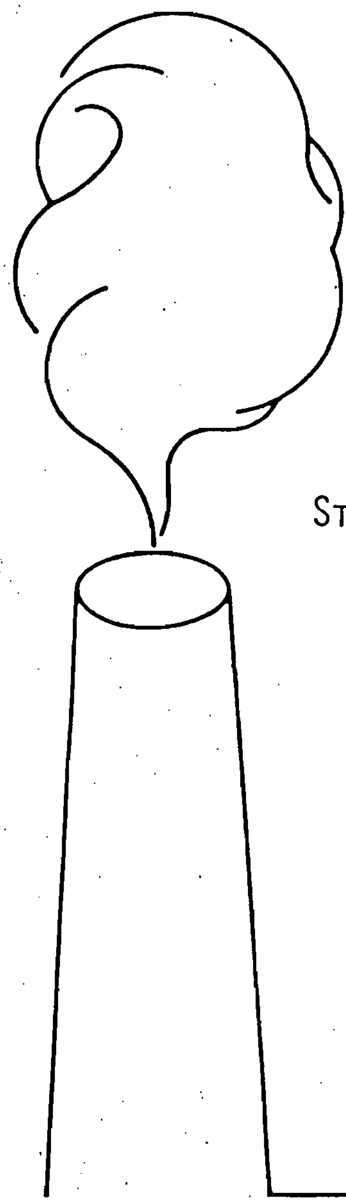
Concerning the air quality impact analysis presented in the application, a new modeling analysis for particulate matter (PM) was not conducted because the presently proposed maximum PM emissions at the higher steam rate for Boiler No. 4 are less than the PM emissions modeled in the original Boiler No. 4 permit application. A comparison of previously modeled emissions and currently proposed emissions are presented below:

Previously modeled:	238.3 TPY	109.1 lb/hr (24-hr avg.)
Currently proposed:	203.48 TPY	105.98 lb/hr (24-hr avg.)

The currently proposed maximum 24-hr average PM emission rate of 105.98 lb/hr is based upon the maximum 6-hr average emissions presented in the permit application. The 6-hour averaging time limitation will limit U. S. Sugar to the 105.98 lb/hr for any 24-hour period. Although U. S. Sugar is proposing a steam rate increase, the currently proposed emissions are lower because the previous modeling was based upon the boiler emitting PM at 0.2 lb/MMBtu, and currently proposed emissions are based upon 0.15 lb/MMBtu. In addition, the currently proposed annual average emissions reflect reduced number of crop days per year.

Since the previous air quality analysis for PM demonstrated compliance with PM air quality standards, and currently proposed emissions are less than previously modeled, the proposed steam rate increase will also comply with the air quality standards.

David A. Buff, P.E.
KBN Engineering & Applied Sciences, Inc.



United States Sugar Corporation

Boiler No. 4 - Clewiston

Stack Tests for Particulate, SO_2, NOx, CO and VOC Emissions

Report 859-S

December 23, 1985

South Florida Environmental Services, Inc.

8211-6 Bama Lane West Palm Beach, Florida 33406 305 / 793-4481

TABLE OF CONTENTS

INTRODUCTION

The United States Sugar Corporation operates a raw sugar mill located near the intersection of W.C. Owens Avenue and Clewiston Street in Clewiston, Hendry County, Florida.

On December 23, 1985, tests for Carbon Monoxide, Oxides of Nitrogen, Particulate, Sulfur Dioxide and Total Gaseous Nonmethane Organic Emissions were performed on the exhaust stack servicing Boiler No. 4.

The tests were performed in order to comply with permit operating conditions set forth in Florida Department of Environmental Regulation Permit No. AC26-80930, and to determine compliance with Chapter 17-02 of the Florida Administrative Code.

A visible emission test was not performed because the plume from Boiler No. 4 was intermingled with the plumes from surrounding boilers, an accurate reading was not possible.

During the testing period, records of the boiler data were maintained by plant personnel, and are presented in the Appendix.

The tests were observed by Mr. Mirza Baig of the Florida Department of Environmental Regulation, Fort Myers office.

The results of these tests verify compliance with the Florida Department of Environmental Regulation Permit No. AC26-80930 and Chapter 17-02 of the Florida Administrative Code.

SOUTH FLORIDA ENVIRONMENTAL SERVICES, INC.

STACK TESTS FOR PARTICULATE, SO2, NOX, CO, AND VOC EMISSIONS

United States Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

Clewiston Mill

Type Process - Sugar Manufacturing

Boiler No. 4

Abatement Device - Turbulaire Impingement Scrubber

Compliance Stack Test

Report 859-S

December 23, 1985

All testing and analysis was performed in accordance with the Florida Department of Environmental Regulation, Florida Administrative Code, Chapter 17-2.

I hereby certify that to my knowledge all data submitted in this report is true and correct.

W. Arlington

William D. Arlington
Project Director

ALLOWABLE EMISSION DETERMINATION

The allowable emissions were determined in accordance with the Florida Department of Environmental Regulation Permit No. AC 26-80930.

CYCLONIC FLOW DETERMINATION

Due to the configuration of the system, cyclonic flow is considered to be non-existent at the sampling site.

SUMMARY OF RESULTS
UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON

PARTICULATE

RUN	EMISSIONS LBS./HR.	ALLOWABLE LBS./HR.	EMISSIONS LBS./MM BTU	ALLOWABLE LBS./MM BTU	EMISSIONS F-FACTOR	LB./MM BTU BY ASME EFFICIENCY
1	71.36	84.21	.127	.150	.1605	.141
2	84.76	84.40	.151	.150	.1837	.163
3	87.86	79.85	.165	.150	.1919	.184
AVERAGE	81.33	82.82	.148	.150	.1787	.164

SULFUR DIOXIDE

RUN	ACTUAL EMISSIONS LBS./MM BTU	ALLOWABLE RATE LBS./MM BTU	EMISSIONS F-FACTOR LB/MM BTU	LB/MM BTU BY ASME EFFICIENCY
1	.0022	.25	.00234	.00250
2	.0014	.25	.00179	.00164
3	.0014	.25	.00181	.00173
AVERAGE	.0016	.25	.00215	.00196

OXIDES OF NITROGEN

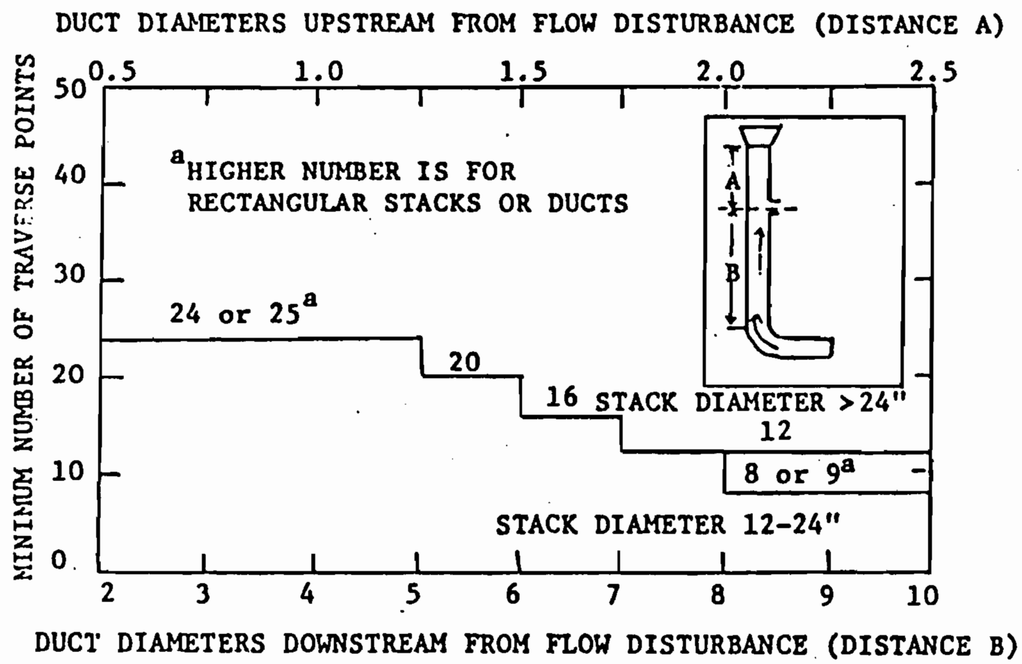
RUN	ACTUAL EMISSIONS LBS./HR.	ALLOWABLE RATE LBS./HR.
1	92.92	136.8
2	70.41	136.8
3	58.17	136.8
AVERAGE	73.83	136.8

CARBON MONOXIDE

RUN	ACTUAL EMISSIONS	ALLOWABLE RATE LB./MM BTU
1	0	.25
2	0	.25
3	0	.25
AVERAGE	0	.25

VOLATILE ORGANIC COMPOUNDS

RUN	ACTUAL EMISSIONS LB./TON WET BAGASSE	ALLOWABLE RATE LB./TON WET BAGASSE
1	1.37	1.7
2	.93	1.7
3	1.66	1.7
AVERAGE	1.32	1.7



CIRCULAR STACKS

Number of points equal next higher multiple of four.

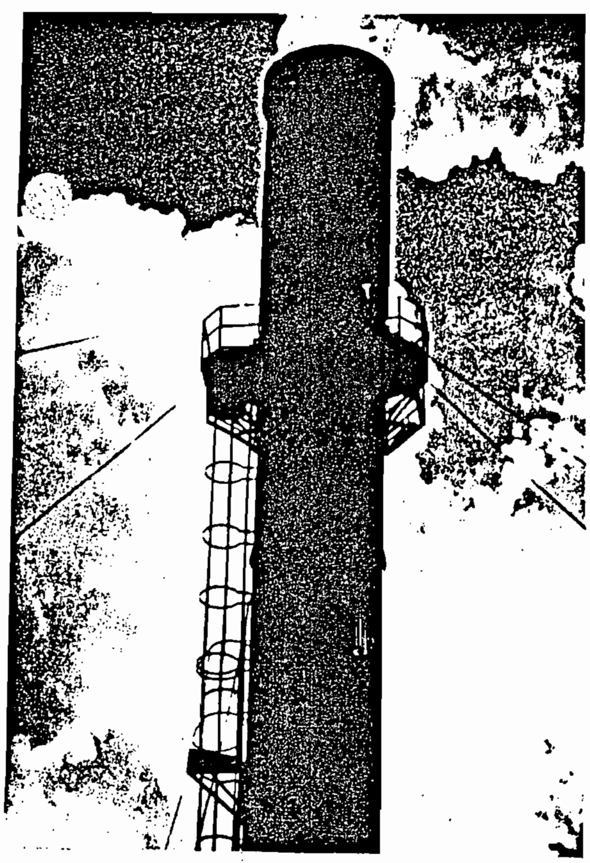
RECTANGULAR STACKS

Number of Traverse Points	Subarea Layout Matrix
9	3 x 3
12	4 x 3
16	4 x 4
20	5 x 4
25	5 x 5
30	6 x 5
36	6 x 6
42	7 x 6
49	7 x 7

SAMPLING POINT DETERMINATION
UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON

STACK CONFIGURATION:	CIRCULAR
DIAMETER (INCHES):	98.75
DISTANCE A - PORT TO DOWNSTREAM DISTURBANCE (INCHES):	168
DISTANCE B - PORT TO UPSTREAM DISTURBANCE (INCHES):	768
NUMBER OF SAMPLING POINTS:	16
NUMBER OF TEST PORTS:	2
NUMBER OF POINTS ON A TRAVERSE:	8

POINT LOCATION ON A TRAVERSE:



TRAVERSE POINT NUMBER	INCHES TO STACK WALL
1	3.2
2	10.3
3	19.1
4	31.9
5	66.8
6	79.6
7	88.4
8	95.6

Particulate Emissions

SUMMARY OF RESULTS - PARTICULATE
UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT NUMBER 859-S

	RUN 1	RUN 2	RUN 3
DATE	12-23-85	12-23-85	12-23-85
ALLOWABLE EMISSIONS (LB/HR)	84.21	84.40	79.85
EMISSION RATE (LB/HR)	71.36	84.76	87.86
ALLOWABLE EMISSIONS (LB/MBTU)	.15	.15	.15
EMISSION RATE (LB/MBTU)	.127	.151	.165
AVERAGE ALLOWABLE (LB/HR)	82.82		
AVERAGE EMISSION (LB/HR)	81.33		
AVERAGE EMISSION (LB/MBTU)	.148		

TEST RESULTS - PARTICULATE
UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT NUMBER 859-S

	RUN 1	RUN 2	RUN 3
AREA (SQ.FT.)	53.19	53.19	53.19
SAMPLE VOLUME (CU.FT.)	31.80	31.97	31.90
WATER VAPOR (CU.FT.)	10.52	10.95	10.73
SAMPLE MOISTURE (%)	24.87	25.52	25.17
SATURATION MOISTURE (%)	27.08	27.54	29.27
MOLECULAR WEIGHT	27.02	26.94	26.98
VELOCITY (FPM)	3511	3507	3504
VOL.FLOW RATE (ACFM)	186739	186530	186374
VOL.FLOW RATE (SCFM-DRY)	121839	120511	120483
CONCENTRATION (GR/DSCF)	.0683	.0821	.0851
EMISSION RATE (LBS/HR)	71.36	84.76	87.86
% ISOKINETIC	95.92	97.50	97.33

FIELD AND ANALYTICAL PROCEDURES
EPA METHOD 5
DETERMINATION OF PARTICULATE EMISSIONS
FROM STATIONARY SOURCES

This method is used in conjunction with Methods 1 through 4 and is applicable for the determination of Particulate Emissions from Stationary Sources.

SUMMARY

A gas sample is extracted isokinetically from the stack through a heated probe and filter. Particulate matter is collected in the probe and on the filter and is measured gravemetrically. The mass of particulate matter includes any material that condenses at or above the specified temerature.

Volumetric flow rate, moisture and other pertinant parameters are determined simultaneous to particulate collection. Mass concentration and emissin rate are then determined based on standard cubic feet of dry gas.

FIELD PROCEDURE

Stack dimensions are determined, including upstream and downstream distances. The number of sampling points and position of each point is layed out in accordance with EPA Method 1. These positions are indicated in this report on the Sampling Point Determination Sheets.

The sampling train is assembled as depicted in the Diagram of Method 5 Sampling Train. The impingers are packed in ice to maintain a temperature of <69 degrees fahrenheit. In order to choose the appropriate nozzle size and K factor (sampling rate factor), assumptions are made of stack gas moisture, molecular weight and velocity (based on prior data or an initial traverse). A cyclonic flow determination is performed, if required, according to EPA Method 1.

A leak check of the sampling system and pitots is performed, correcting any leaks encountered.

After the appropriate warm-up of the heated components, the nozzle is unblocked, and the probe inserted into the stack to the first sampling point. The pump is immediately turned on and the sampling rate adjusted to provide an isokinetic flow rate.

Each point is then sampled at an even interval of between two to five minutes, adjusting the flow rate and recording all indicated data on the Field Data Sheets.

A sample of the gas is extracted after leaving the orifice meter for analysis of CO2, O2 and CO, where applicable.

After all sampling points have been sampled, observing both minimum sampling time and sampling volume as specified, the pump is shut off and the probe removed from the stack. A final leak check is performed on the system and the leakage rate recorded on the Field Data Sheet.

The probe and filter are removed from the sampling train to the clean-up area where all particulates are washed from the probe, nozzle and filter holder front half, and then sealed in a bottle marking the liquid level. The filter is removed and sealed in a separate container.

The impingers are removed from the ice bath, all moisture is measured volumetrically. The silica gel is removed and placed in a sealed plastic container.

The sampling procedure is then repeated twice more to provide three test runs per compliance test.

All samples, including a blank filter, are identified by report and run number or as a blank.

At the conclusion of the last test run a calibration check on the dry gas meter and orifice meter (Y/Yi) is performed. The result is logged on the Field Data Sheets.

LABORATORY PROCEDURES

Upon receipt of the samples, the liquid level is checked for any loss. These solutions are then quantatively transfered to pre-tared beakers and placed along with the filters in an oven at 105 degrees centigrade until dry, then placed in a desicator until cool and weighed to 0.1 mg.

The silica gel is weighed and reported 0.1 gm.

Prior to field operations, all filters and beakers are pre-conditioned in the same manner as described above, numbered for identification, and weighed to the appropriate tolerance.

The silica gel is pre-dryed at 175 degrees centigrade, weighed to 200.0 grams and placed in a sealed plastic bottle.

The balances are checked using Class-S Weights as specified in the U.S. Environmental Protection Agency Quality Assurance Procedures.

Acetone residues are used as specified by the supplier, (not to exceed .001%).

CALCULATIONS

All calculations are identical to those given in EPA Reference Methods 1 through 5.

FIELD SAMPLING EQUIPMENT

Probe Nozzle - 316 stainless steel, button hook configuration with sharp leading edge.

Probe - 316 stainless steel inner core wrapped with heating wire and insulation to maintain a temperature of 250 degrees fahrenheit.

Pitot Tube - Stainless steel, Type S, attached to the probe.

Filter Holder - Borosilicate glass with a stainless steel frit filter support and 28/15 joints attached directly to the probe.

Impingers - Glass with ball joints and glass U-tube connectors connected in series. The first, third and fourth being modified Greenburg-Smith type, the second Greenburg-Smith standard tip. The first and second impingers containing 100 mls. of distilled water, the third impinger left empty, and the fourth containing 200.0 grams of silica gel.

Control Box - Contains a duel inclined manometer, Rockwell 175-S dry gas meter, orifice meter, vacuum gauge, impinger outlet, stack and filter temperatures, and the necessary tubing and valves to maintain leak-free sampling

Pump - Sliding vane type, maintained leak free to move the sample gas through the system.

Thermocouple Probes - Copper constantan with stainless steel outer sheath. The stack thermocouple probe is attached directly to the main probe. The filter probe is inserted in the lower portion of the filter holder directly in the gas stream.

Umbilical Cord - Of sufficient length to connect the probe and filter to the control box and impingers, including all necessary wiring and tubing for temperature control, sample transfer, and pitot pressures. All tubing and fittings are leak-free.

Barometer - Aneroid type capable of measuring atmospheric pressure to plus or minus 0.1" hg.

Orsat Gas Analyzer - Capable of measuring CO2, CO and O2 to plus or minus 0.1%, maintained leak-free.

Fyrite Gas Analyzer - Used to determine CO2 and O2 when required for molecular weight determination and when Method 19 is not required. The Fyrite Analyzer is maintain leak-free.

*** All equipment is designed in accordance with "Maintenance, Calibration, and Operation of Source Sampling Equipment," (APTD-0576).

CALIBRATION

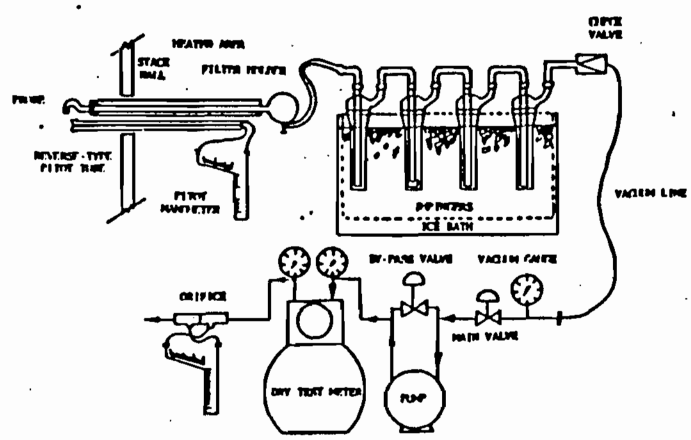
All equipment calibrations are performed in accordance with the procedures outlined in the U.S. Environmental Protection Agency Quality Assurance Manual, Volume III, and logged in the Calibration Log Book.

Calibrations are performed periodically to comply with the frequency of calibrations specified by the State of Florida Department of Environmental Regulation, and the appropriate reference method. Additional calibrations are performed whenever the equipment is damaged.

The latest calibrations are included in this report.

*** The procedures described herein are not to be considered as complete test procedures used, but as a general overview of the methods employed.

DIAGRAM OF METHOD 5 SAMPLING TRAIN



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SUMMARY OF FIELD AND LABORATORY DATA
UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT NUMBER 859-S

	RUN 1	RUN 2	RUN 3
DATE	12-23-85	12-23-85	12-23-85
START TIME	0900	1612	1934
STOP TIME	1005	1720	2056
CP FACTOR	.824	.824	.824
Y	1.0030	1.0030	1.0030
Y/YI	1.0070	1.0070	1.0070
THA	1.777	1.777	1.777
DIAMETER OF NOZZLE (IN.)	.2103	.2103	.2103
DIAMETER OF STACK (IN.)	98.75	98.75	98.75
NO. STACKS	1	1	1
STATIC PRES. (IN. H2O)	-.36	-.36	-.36
BAROMETRIC PRES. (IN. HG)	30.21	30.21	30.21
TEST TIME (MIN.)	60	60	60
METER VOLUME (CU.FT.)	31.00	31.97	32.36
SQ.RT.^P (IN.H2O)	.958	.955	.953
R[illegible]E PRES. ^H (IN.H2O)	.919	.941	.939
AVG.METER TEMP. (DEG.F)	62.3	75.8	83.4
AVG.STACK TEMP. (DEG.F)	153.1	153.8	156.3
TOTAL PARTICULATE WT. (GMS)	.1408	.1700	.1759
WATER COLLECTED (MLS)	223.6	232.7	228.0
MOLECULAR WT. (DRY)	30.00	30.00	30.00
SATURATION MOISTURE (%)	27.08	27.54	29.27

PARTICULATE FIELD DATA

PLANT USSC - Clewiston
REPORT 859-5-1
DATE Dec. 23, 1985
OPERATOR DSA
TIME 0900 - 1005
K FACTOR ~~3.0~~ 1.0
ASSUMED MOISTURE % 30
DRY GAS METER NO. 4
NOZZLE ID NO. 5/32A
WET BULB TEMP. 156 °F
POST LEAK CHECK .000 cfm @ 15"
Cp .834 (P.8)
Y 1.0030

Y/Y₁ 1.0070
Δ Ha 1.7767
Dn .2103
DIAMETER (in) 98.75
NO. DUCT 1
STATIC PRES. -.36
BAR. PRES. (in. Hg) 30.21
TEST TIME (min) 60
METERED VOL. 31.00
AVE. $\sqrt{\Delta p}$ .958
AVG. ΔH .919
AVG. METER TEMP. 62.3
AVG. STACK TEMP. 153.1

TRAVERSE POINT NUMBER	SAMPLING TIME (min)	DRY GAS METER CU. FT.	VELOCITY HEAD (Δp) in. H_2O	PRESSURE ORIFICE METER (ΔH) in H_2O	DRY GAS TEMP. (°F)	PUMP VACUUM (in. Hg.)	IMPINGER (°F)	FILTER TEMP. (°F)	STACK TEMP. (°F)
		988.17							
1	3.75	989.87	.78	.78	59	6	53	253	155
2		991.74	.90	.90	58	6	48	257	154
3		993.85	.99	.99	59	7	47	260	155
4		995.91	1.10	1.10	59	7	47	264	155
5		997.86	1.05	1.05	60	8	47	262	154
6		999.81	.87	.87	60	8	48	263	154
7		1.65	.85	.85	61	8	48	263	152
8		3.50	.81	.81	62	8	48	262	152
	–	–	–	–	–	–	–	–	–
1	3.75	5.45	.87	.87	63	9	48	252	153
2		7.40	.96	.96	63	10	47	266	152
3		9.42	.99	.99	64	10	48	269	153
4		11.51	1.00	1.00	64	11	48	273	153
5		13.47	.96	.96	65	11	48	264	153
6		15.42	.90	.90	66	11	49	259	153
7		17.39	.87	.87	66	10	49	260	150
8		19.17	.81	.81	67	10	48	267	151
	Mirza Baig								

Mirza Baig

LABORATORY DATA

UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT NUMBER 859-S-1 DATE 12/24/85

FILTER NUMBER 2395

FINAL WEIGHT	.4971	GRAMS
TARE WEIGHT	.3726	GRAMS
DIFFERENCE	.1245	GRAMS

BEAKER NUMBER 1

FINAL WEIGHT	95.8218	GRAMS
TARE WEIGHT	95.8042	GRAMS
DIFFERENCE	.0176	GRAMS

FILTER BLANK NO 2441

FINAL WEIGHT	.3753	GRAMS
TARE WEIGHT	.3752	GRAMS
DIFFERENCE	1E-04	GRAMS

WASH DOWN BLANK

VOLUME OF RINSE	160	MLS
SOLUTION RESIDUE	7.843E-06	GR/ML
TOTAL RESIDUE	1.3E-03	GRAMS

TOTAL PARTICULATE WEIGHT .1408 GRAMS

WATER COLLECTED

TOTAL WATER	409.9	MLS
INITIAL WATER	200.0	MLS
FINAL SILICA	213.7	GRAMS
INITIAL SILICA	200.0	GRAMS

TOTAL WATER COLLECTED 223.6 MLS

ANALYST SB

PARTICULATE FIELD DATA

PLANT USSC-Clewiston

REPORT 859-5-3

DATE Dec 23, 1985

OPERATOR ~~SR~~ A

TIME 1934 - 2056

K FACTOR 1.03

ASSUMED MOISTURE % 30

DRY GAS METER NO. 4

NOZZLE ID NO. 5/32A

WET BULB TEMP. 153°F

POST LEAK CHECK .002 cfm @ 15"

Cp .824 (P8)

Y 1.0030

Y/Y[1] 1.0070

Δ Ha 1.7767

Dn .2103

DIAMETER (in) 98.75

NO. DUCT 1

STATIC PRES. -.36

BAR. PRES. (in. Hg) 30.21

TEST TIME (min) 60

METERED VOL. 32.36

AVE. $\sqrt{\Delta p}$ .953

AVG. ΔH .939

AVG. METER TEMP. 83.4

AVG. STACK TEMP. 156.3

TRAVERSE POINT NUMBER	SAMPLING TIME (min)	DRY GAS METER CU. FT.	VELOCITY HEAD (Δp) in. H_2O	PRESSURE ORIFICE METER (ΔH) in H_2O	DRY GAS TEMP. (°F)	PUMP VACUUM (in. Hg.)	IMPINGER (°F)	FILTER TEMP. (°F)	STACK TEMP. (°F)
		52.40							
1	3.75	54.31	.80	.82	83	7	62	227	156
2		56.38	.89	.92	83	7	51	248	155
3		58.34	.95	.98	83	7	50	242	155
4		60.70	.95	.98	83	8	50	239	156
5		62.41	.92	.95	82	10	50	242	158
6		64.71	.98	1.01	82	10	51	248	155
7		66.81	.96	.99	83	10	51	259	156
8		68.83	.95	.98	82	10	50	262	156 *
—	—	—	—	—	—	—	—	—	—
1	3.75	70.70	.75	.77	84	10	59	201	158
2		73.11	.92	.95	84	10	51	252	157
3		75.11	.93	.96	84	12	51	247	154
4		76.86	.94	.97	84	12	52	236	158
5		79.01	.94	.97	84	12	53	237	156
6		80.87	.89	.92	84	12	53	232	158
7		82.72	.89	.92	84	9	60	240	156
8		84.76	.90	.93	85	10	53	224	156
*	mill	down	10	min.					
		Musizyn Baig							

PARTICULATE FIELD DATA

PLANT USSC - Claviston

REPORT 8595-2

DATE Dec 23, 1985

OPERATOR QA

TIME 1612 - 1720

K FACTOR 1.03

ASSUMED MOISTURE % 30

DRY GAS METER NO. 4

NOZZLE ID NO. .2103 5/32A

WET BULB TEMP. 153°F

POST LEAK CHECK .002 CFM @ 15"

Cp .824 (2.8)

Y 1.0030

Y/Y$_i$ 1.0070

Δ Ha 1.7767

Dn .2103

DIAMETER (in) 98.75

NO. DUCT 1

STATIC PRES. -.36

BAR. PRES. (in. Hg) 30.21

TEST TIME (min) 60

METERED VOL. 31.97

AVE. $\sqrt{\Delta p}$ .955

AVG. ΔH .941

AVG. METER TEMP. 75.8

AVG. STACK TEMP. 153.8

TRAVERSE POINT NUMBER	SAMPLING TIME (min)	DRY GAS METER CU. FT. 20.14 ~~19.78~~	VELOCITY HEAD (Δ p) in. H_2O	PRESSURE ORIFICE METER (Δ H) in H_2O	DRY GAS TEMP. (°F)	PUMP VACUUM (in. Hg.)	IMPINGER (°F)	FILTER TEMP. (°F)	STACK TEMP. (°F)
1	3.75	22.06	.84	.87	74	6	57	202	153
2		24.12	.94	.97	74	6	49	233	154
3		26.41	.91	.94	74	6	49	234	153
4		28.42	.99	1.02	74	7	49	243	154
5		30.42	.94	.97	74	7	49	246	153
6		32.37	.94	.97	74	8	50	237	153
7		34.21	.90	.93	75	7	50	246	154
8		36.14	.88	.91	75	8	50	253	155
	—	—	—	—	—	—	—	—	—
1	3.75	38.21	.88	.91	76	8	52	239	[illegible]
2		40.29	.94	.97	76	9	50	257	154
3		42.22	.98	1.01	77	10	51	259	154
4		44.31	.96	.99	77	10	51	257	154
5		46.42	.95	.98	78	10	52	255	154
6		48.33	.91	.94	78	10	52	257	153
7		50.41	.84	.87	78	10	52	259	153
8		52.11	.79	.81	79	10	52	258	155

LABORATORY DATA

UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT NUMBER 859-S-2 DATE 12/24/85

FILTER NUMBER 2396

FINAL WEIGHT	.5307 GRAMS
TARE WEIGHT	.3790 GRAMS
DIFFERENCE	.1517 GRAMS

BEAKER NUMBER 2

FINAL WEIGHT	98.3661 GRAMS
TARE WEIGHT	98.3467 GRAMS
DIFFERENCE	.0194 GRAMS

FILTER BLANK NO 2441

FINAL WEIGHT	.3753 GRAMS
TARE WEIGHT	.3752 GRAMS
DIFFERENCE	1E-04 GRAMS

WASH DOWN BLANK

VOLUME OF RINSE	140 MLS
SOLUTION RESIDUE	7.843E-06 GR/ML
TOTAL RESIDUE	1.1E-03 GRAMS

TOTAL PARTICULATE WEIGHT .1700 GRAMS

WATER COLLECTED

TOTAL WATER	423.6 MLS
INITIAL WATER	200.0 MLS
FINAL SILICA	209.1 GRAMS
INITIAL SILICA	200.0 GRAMS

TOTAL WATER COLLECTED 232.7 MLS

ANALYST SB

LABORATORY DATA

UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT NUMBER 859-S-3

DATE 12/24/85

FILTER NUMBER 2397

FINAL WEIGHT	.5367 GRAMS
TARE WEIGHT	.3727 GRAMS
DIFFERENCE	.1640 GRAMS

BEAKER NUMBER 3

FINAL WEIGHT	86.6258 GRAMS
TARE WEIGHT	86.6126 GRAMS
DIFFERENCE	.0132 GRAMS

F ER BLANK NO 2441

FINAL WEIGHT	.3753 GRAMS
TARE WEIGHT	.3752 GRAMS
DIFFERENCE	1E-04 GRAMS

WASH DOWN BLANK

VOLUME OF RINSE	170 MLS
SOLUTION RESIDUE	7.843E-06 GR/ML
TOTAL RESIDUE	1.3E-03 GRAMS

TOTAL PARTICULATE WEIGHT .1759 GRAMS

WATER COLLECTED

TOTAL WATER	419.3 MLS
INITIAL WATER	200.0 MLS
FINAL SILICA	208.7 GRAMS
INITIAL SILICA	200.0 GRAMS

TOTAL WATER COLLECTED 228.0 MLS

ANALYST SB

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ALLOWABLE EMISSIONS
PARTICULATE

'ITED STATES SUGAR CORPORATION
'ILER NO. 4 - CLEWISTON
:N NUMBER 859-S-1

'U OF STEAM @ 765 F & 620 PSIA	1386.9 BTU/LB
'U OF FEED WATER @ 240 F & 900 PSIA	210.6 BTU/LB
'T BTU VALUE OF STEAM	1176.3 BTU/LB
NITIAL INTEGRATOR READING 9277	
INAL INTEGRATOR READING 9357	
NTEGATOR FACTOR 3500	
'OTAL TIME(MIN.) 64	
TEAM PRODUCTION RATE	262500 LB/HR
'URNACE EFFICENCY	55%
'OTAL HEAT INPUT	561.4 MBTU/HR
'EAT INPUT - OIL	0 MBTU/HR
'EAT INPUT - BAGASSE	561.4 MBTU/HR
LLOWABLES - OIL @ .1 LB/MBTU	0 LB/HR
LLOWABLES - BAGASSE @ .15 LB/MBTU	84.21 LB/HR
OTAL ALLOWABLES @ .15 LB/MBTU	84.21 LB/HR

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ALLOWABLE EMISSIONS
PARTICULATE

NITED STATES SUGAR CORPORATION
OILER NO. 4 - CLEWISTON
UN NUMBER 859-S-2

TU OF STEAM @ 760 F & 620 PSIA	1384 BTU/LB
TU OF FEED WATER @ 250 F & 900 PSIA	220.6 BTU/LB
ET BTU VALUE OF STEAM	1163.4 BTU/LB

NITIAL INTEGATOR READING	9812	
INAL INTEGATOR READING	9888	
NTEGATOR FACTOR	3500	
OTAL TIME(MIN.)	60	
TEAM PRODUCTION RATE		266000 LB/HR
URNACE EFFICENCY		55%

OTAL HEAT INPUT	562.7 MBTU/HR
EA. INPUT - OIL	0 MBTU/HR
EAT INPUT - BAGASSE	562.7 MBTU/HR
LLOWABLES - OIL @ .1 LB/MBTU	0 LB/HR
LLOWABLES - BAGASSE @ .15 LB/MBTU	84.4 LB/HR

OTAL ALLOWABLES @ .15 LB/MBTU	84.4 LB/HR

ALLOWABLE EMISSIONS
PARTICULATE

UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
RUN NUMBER 859-S-3

BTU OF STEAM @ 760 F & 600 PSIA	1385.1 BTU/LB
BTU OF FEED WATER @ 250 F & 900 PSIA	220.6 BTU/LB
NET BTU VALUE OF STEAM	1164.5 BTU/LB
INITIAL INTEGATOR READING 132	
FINAL INTEGATOR READING 217	
INTEGATOR FACTOR 3500	
TOTAL TIME(MIN.) 71	
STEAM PRODUCTION RATE	251408.5 LB/HR
FURNACE EFFICENCY	55%
TOTAL HEAT INPUT	532.3 MBTU/HR
HEAT INPUT - OIL	0 MBTU/HR
HEAT INPUT - BAGASSE	532.3 MBTU/HR
ALLOWABLES - OIL @ .1 LB/MBTU	0 LB/HR
ALLOWABLES - BAGASSE @ .15 LB/MBTU	79.85 LB/HR
TOTAL ALLOWABLES @ .15 LB/MBTU	79.85 LB/HR

ALLOWABLE EMISSIONS
PARTICULATE

UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
RUN NUMBER 859-S-3

BTU OF STEAM @ 760 F & 600 PSIA	1385.1 BTU/LB
BTU OF FEED WATER @ 250 F & 900 PSIA	220.6 BTU/LB
NET BTU VALUE OF STEAM	1164.5 BTU/LB
INITIAL INTEGRATOR READING 132	
FINAL INTEGRATOR READING 217	
INTEGRATOR FACTOR 3500	
TOTAL TIME(MIN.) 71	
STEAM PRODUCTION RATE	251408.5 LB/HR
FURNACE EFFICENCY	55%
TOTAL HEAT INPUT	532.3 MBTU/HR
HEAT INPUT - OIL	0 MBTU/HR
HEAT INPUT - BAGASSE	532.3 MBTU/HR
ALLOWABLES - OIL @ .1 LB/MBTU	0 LB/HR
ALLOWABLES - BAGASSE @ .15 LB/MBTU	79.85 LB/HR
TOTAL ALLOWABLES @ .15 LB/MBTU	79.85 LB/HR

CALCULATIONS FOR RUN 1 - PARTICULATE

STACK AREA

(DIAMETER / 24)SQ. X 3.1416 X NO. OF STACKS

(98.75 / 24)SQ. X 3.1416 X 1

53.187

STACK PRESSURE

BAROMETRIC PRESSURE + (STATIC PRESSURE / 13.6)

30.21 + (-.36 / 13.6)

30.184

SAMPLE VOLUME

17.64 X (Y) X METER VOLUME X STACK PRESURE / (METER TEMP. + 460)

17.64 X 1.003 X 31 X 30.184 / (62.3 + 460)

31.795

WATER VAPOR VOLUME

.04707 X WATER COLLECTED

.04707 X 223.6

10.525

PERCENT MOISTURE

100 X WATER VAPOR VOLUME / (WATER VAPOR VAPOR VOLUME + SAMPLE VOLUME)

100 X 10.525 / (10.525 + 31.795)

24.87

CALCULATIONS FOR RUN 1 - PARTICULATE

SATURATION MOISTURE

100 X (VAPOR PRESSURE @ STACK TEMP. / STACK PRESSURE)

100 X (8.173 / 30.184)

27.077

STACK MOISTURE FRACTION

THE LESSOR OF SAMPLE MOISTURE OR SATURATION MOISTURE / 100

24.87 / 100

.2487

MOLECULAR WEIGHT OF STACK GAS

29.00 (DRYERS) OR 30.00 (BOILERS) X (1 - MOISTURE) / (18 X MOISTURE)

30 X (1 - .2487) / (18 X .2487)

27.016

STACK VELOCITY

5.49 X CP X 60 X ^P X SQR(STACK TEMP. + 460) /SQR(STACK PRESSURE X MOLECULAR WT.)

85.49 X .824 X 60 X .958 X SQR(153.1 + 460)

SQR(30.184 X 27.016)

3511

VOLUMETRIC FLOW RATE (ACFM)

STACK AREA X STACK VELOCITY

53.18/ X 3511

186738.9

CALCULATIONS FOR RUN 1 - PARTICULATE

VOLUMETRIC FLOW RATE (SCFM DRY)

17.64 X (ACFM) X STACK PRESSURE X (1-MOISTURE) / (STACK TEMP. + 460)

17.64 X 186738.9 X 30.184 X (1-.2487) / (153.1 + 460)

121839.4

PARTICULATE CONCENTRATION

15.43 X PARTICULATE WEIGHT / SAMPLE VOLUME

15.43 X .1408 / 31.795

.0683299999

EMISSION RATE

CONCENTRATION X (SCFM DRY) X 60 / 7000

.0683299999 X 121839.4 X 60 / 7000

71.359

PERCENT ISOKINETIC

.0945 X (STACK TEMP. + 460) X SAMPLE VOLUME X 60

STACK PRES. X VELOCITY X NOZZLE AREA X TEST TIME X (1-MOISTURE)

.0945 X 153.1+ 460) X 31.795 X 60

30.184 X 3511 X 2.4E-04 X 60 X (1 - .2487)

95.918

Particulate Emissions by F-Factor

EMISSIONS BY F-FACTOR BASED ON 9366 DSCF/10^6 BTU
UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT 859-S

RUN	CONCENTRATION GRAINS/DSCF	CONCENTRATION LB/DSCF	PERCENT O2	EMISSIONS LB/10^6 BTU
1	.0683	9.757×10^{-6}	9.0	.1605
2	.0821	1.173×10^{-5}	8.4	.1837
3	.0851	1.216×10^{-5}	8.5	.1919
Average				.1787

$$\text{EMISSIONS} = \frac{Fd \times Cs \times 20.9}{(20.9 - O2)}$$

Particulate Emissions by ASME Efficiency

SUMMARY OF RESULTS
UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT NUMBER 859-S
BASED ON 61.19% EFFICIENCY

	RUN 1	RUN 2	RUN 3
DATE	12-23-85	12-23-85	12-23-85
ALLOWABLE EMISSIONS(LB/HR)	75.69	75.86	71.77
EMISSION RATE(LB/HR)	71.36	84.76	87.86
ALLOWABLE EMISSIONS(LB/MBTU)	.15	.15	.15
EMISSION RATE(LB/MBTU)	.141	.168	.134
AVERAGE ALLOWABLE(LB/HR)	74.44		
AVERAGE EMISSION(LB/HR)	81.33		

ALLOWABLE EMISSIONS

UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
RUN NUMBER 859-S-1

BTU OF STEAM @ 765 F & 620 PSIA	1386.9 BTU/LB
BTU OF FEED WATER @ 240 F & 900 PSIA	210.6 BTU/LB
NET BTU VALUE OF STEAM	1176.3 BTU/LB

INITIAL INTEGRATOR READING	9277	
FINAL INTEGRATOR READING	9357	
INTEGRATOR FACTOR	3500	
TOTAL TIME(MIN.)	64	
STEAM PRODUCTION RATE		262500 LB/HR
FURNACE EFFICENCY		61.19%

TOTAL HEAT INPUT	504.6 MBTU/HR
HEAT INPUT - OIL	0 MBTU/HR
HEAT INPUT - BAGASSE	504.6 MBTU/HR
ALLOWABLES - OIL @ .1 LB/MBTU	0 LB/HR
ALLOWABLES - BAGASSE @ .15 LB/MBTU	75.69 LB/HR

TOTAL ALLOWABLES @ .15 LB/MBTU	75.69 LB/HR

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ALLOWABLE EMISSIONS

ITED STATES SUGAR CORPORATION
ILER NO. 4 - CLEWISTON
N NUMBER 859-S-2

'U OF STEAM @ 760 F & 620 PSIA	1384 BTU/LB
'U OF FEED WATER @ 250 F & 900 PSIA	220.6 BTU/LB
ET F[illegible] VALUE OF STEAM	1163.4 BTU/LB

NITIAL INTEGATOR READING	9812
INAL INTEGATOR READING	9888
NTEGATOR FACTOR	3500
OTAL TIME(MIN.)	60
TEAM PRODUCTION RATE	266000 LB/HR
'URNACE EFFICENCY	61.19%

'OTAL HEAT INPUT	505.7 MBTU/HR
IEAT INPUT - OIL	0 MBTU/HR
IEAT INPUT - BAGASSE	505.7 MBTU/HR
ALLOWABLES - OIL @ .1 LB/MBTU	0 LB/HR
ALLOWABLES - BAGASSE @ .15 LB/MBTU	75.86 LB/HR

TOTAL ALLOWABLES @ .15 LB/MBTU — 75.86 LB/HR

ALLOWABLE EMISSIONS

UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
RUN NUMBER 859-S-3

BTU OF STEAM @ 760 F & 600 PSIA		1385.1 BTU/LB
BTU OF FEED WATER @ 250 F & 900 PSIA		220.6 BTU/LB
NET BTU VALUE OF STEAM		1164.5 BTU/LB
INITIAL INTEGRATOR READING	132	
FINAL INTEGRATOR READING	217	
INTEGRATOR FACTOR	3500	
TOTAL TIME(MIN.)	71	
STEAM PRODUCTION RATE		251408.5 LB/HR
FURNACE EFFICENCY		61.19%
TOTAL HEAT INPUT		478.5 MBTU/HR
HEAT INPUT - OIL		0 MBTU/HR
HEAT INPUT - BAGASSE		478.5 MBTU/HR
ALLOWABLES - OIL @ .1 LB/MBTU		0 LB/HR
ALLOWABLES - BAGASSE @ .15 LB/MBTU		71.77 LB/HR
TOTAL ALLOWABLES @ .15 LB/MBTU		71.77 LB/HR

Carbon Monoxide

TEST RESULTS
UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT NUMBER 859-S

Percent Carbon Monoxide was determined in accordance with EPA Method 3 for Integrated Sampling. The results of each run were at or below the minimum detectable limit.

RUN	PERCENT CO
1	<0.1
2	<0.1
3	<0.1

GAS ANALYSIS DATA FORM

PLANT UNITED STATES SUGAR CORPORATION - CLEWISTON COMMENTS:
DATE 12-23-85 TEST NO 859-S-1
SAMPLING TIME (24-hr CLOCK) 0900 - 1005
SAMPLING LOCATION STACK SAMPLING PORTS
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) INTEGRATED BAG
ANALYTICAL METHOD EPA METHOD 3
AMBIENT TEMPERATURE
OPERATOR WA

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d.
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	11.7		11.7		11.7		11.7	44/100	5.14
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	20.7	9.0	20.7	9.0	20.7	9.0	9.0	32/100	2.88
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	20.7	0	20.7	0	20.7	0	0	28/100	0
N_2 (NET IS 100 MINUS ACTUAL CO READING)		79.3		79.3		79.3	79.3	28/100	22.20
								TOTAL	30.22

GAS ANALYSIS DATA FORM

PLANT UNITED STATES SUGAR CORPORATION - CLEWISTON COMMENTS:

DATE 12-23-85 TEST NO 859-S-2

SAMPLING TIME (24-hr CLOCK) 1612 - 1720

SAMPLING LOCATION STACK SAMPLING PORTS

SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) INTEGRATED BAG

ANALYTICAL METHOD EPA METHOD 3

AMBIENT TEMPERATURE

OPERATOR wf

GAS \ RUN	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d.
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	12.2		12.3		12.3		12.3	44/100	5.41
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	20.6	8.4	20.7	8.4	20.7	8.4	8.4	32/100	2.68
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	20.7	0.1	20.7	0	20.7	0	<0.1	28/100	0
N_2 (NET IS 100 MINUS ACTUAL CO READING)		79.3		79.3		79.3	79.3	28/100	22.20
								TOTAL	30.29

GAS ANALYSIS DATA FORM

PLANT UNITED STATES SUGAR CORPORATION - CLEWISTON COMMENTS:
DATE 12-23-85 TEST NO 859-S-3
SAMPLING TIME (24-hr CLOCK) 1934-2056
SAMPLING LOCATION STACK SAMPLING PORTS
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) INTEGRATED BAG
ANALYTICAL METHOD EPA METHOD 3
AMBIENT TEMPERATURE
OPERATOR wA

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d.
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	12.2		12.3		12.3		12.3	44/100	5.41
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	20.7	8.5	20.8	8.5	20.8	8.5	8.5	32/100	2.72
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	20.7	0	20.8	0	20.8	0	0	28/100	0
N_2 (NET IS 100 MINUS ACTUAL CO READING)		79.3		79.2		79.2	79.2	28/100	22.18
								TOTAL	30.31

Quality Assurance Handbook M3-4.2

SULFUR DIOXIDE

TEST RESULTS - SULFUR DIOXIDE
UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT 859-S

CALCULATIONS

WSO2 = K2(VT-VTB)N(VSOLN/VA)

CSO2 = (WSO2/VM)

E = CSO2 X QS X 60

NOMENCLATURE

W2SO - SULFUR DIOXIDE CAPTURED IN SAMPLE, POUNDS
K2 - 7.061 X 10^{-5} LBS./MEG.
VT - VOLUME OF TITRATE (ML) SAMPLE
VTB - VOLUME OF TITRATE (ML) BLANK
N - NORMALITY OF TITRATE
VSOL - VOLUME OF SOLUTION
VA - VOLUME OF ALIQUOT TITRATED
CSO2 - CONCENTRATION OF SULFUR DIOXIDE, (LB/DSCF)
VM - VOLUME AT THE METER (STD CU./FT.)
QS - VOLUMETRIC FLOW RATE (SCFM)
E - EMISSION RATE (LBS./HR.)

BLANK (VTB) = 0
NORMALITY (N) = .01036

RUN	VT	VSOL	VA	VM	CSO2	QS	EMISSIONS
1	.3	500	20	31.80	2E-07	12187	1.26
2	.2	500	20	31.97	1E-07	120509	.83
3	.2	500	20	31.90	1E-07	120481	.83
AVERAGE							.97

FIELD AND ANALYTICAL PROCEDURES
EPA METHOD 6
DETERMINATION OF SULFUR DIOXIDE EMISSIONS
FROM STATIONARY SOURCES

Determination of Sulfur Dioxide was accomplished by utilizing the option of simultaneous determination with EPA Method 5. The water in the impingers was replaced with 3% H2O2 as specified in the reference method. Upon completion of each test run, the H2O2 solution was removed from the impingers, measured and diluted to one liter for analysis according to EPA Method 6.

Oxides of Nitrogen

TEST RESULTS - OXIDES OF NITROGEN
UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT 859-S

VSC - SAMPLE VOLUME AT STANDARD CONDITIONS, DRY BASIS, ML

M - MASS OF NOX AS NO2 IN GAS SAMPLE, MG.

C - CONCENTRATION OF NOX AS NO2, DRY BASIS, CORRECTED TO STANDARD CONDITIONS, LB./DSCF

E - EMISSION RATE, LBS./HR.

RUN	VSC	N	C	E
1	568.3	81.4	8.9E-06	64.89
2	1922.5	335.4	1.09E-05	79.04
3	1922.9	454.7	1.48E-05	107.13
4	1924.2	512.2	1.66E-05	120.6
5	1867.1	238.6	8E-06	57.89
6	1886.8	282.1	9.3E-06	67.73
7	1847.0	308.7	1.04E-05	75.73
8	1901.1	336.8	1.11E-05	80.27
9	1906.3	324.2	1.06E-05	77.04
10	1878.3	289.1	9.6E-06	69.73
11	1879.7	190.9	6.3E-06	46.00
12	1912.4	168.4	5.5E-06	39.89
AVERAGE				73.83

OXIDES OF NITROGEN

FIELD DATA

REPORT 859-S OPERATOR UA SAMPLE LOCATION Stack [illegible]

DATE 12-23-85 INSTALLATION Boiler BAROMETRIC PRESSURE 30.21

SAMPLE NUMBER	FLASK & VALVE NUMBER	SAMPLE TIME	PROBE TEMPERATURE	LEG A_i	LEG B_i	INITIAL PRESSURE
1	1	0908	155	31.2	2.6	1.61
2	2	0921	154	31.3	2.6	1.51
3	3	0943	153	31.3	2.6	1.51
4	4	0955	151	31.3	2.6	1.51
5	5	1617	154	31.3	2.7	1.61
6	6	1633	154	31.3	2.7	1.61
7	7	1653	154	31.2	2.8	1.81
8	8	1707	153	31.3	2.6	1.51
9	9	1944	155	31.3	2.7	1.61
10	10	1954	158	31.3	2.7	1.61
11	11	2023	154	31.2	2.7	1.71
12	12	2035	156	31.3	2.6	1.51

OXIDES OF NITROGEN

LABORATORY DATA

REPORT 859-5 ANALYST WA kc 701.7

DATE 12-26-85 BAROMETRIC PRESSURE 30.31 Ph ADJUSTMENT MADE Yes

SAMPLE NUMBER	FLASK & VALVE NUMBER	TIME	LEG A_f	LEG B_f	FINAL PRESSURE P_f	FINAL TEMPERATURE T_f	FLASK VOLUME V_f	ABSORBANCE A	DILUTION FACTOR f
1	1	0900	6.8	27.1	10.01	67	2053	.058	1
2	2	0902	16.8	17.2	29.91	67	2049	.239	1
3	3	0904	16.8	17.2	29.91	67	2049	.324	1
4	4	0906	16.8	17.2	29.91	67	2050	.365	1
5	5	0908	16.4	17.6	29.11	67	2054	.170	1
6	6	0910	16.6	17.4	29.51	67	2046	.201	1
7	7	0912	16.4	17.6	29.11	67	2047	.220	1
8	8	0914	16.6	17.4	29.51	67	2054	.240	1
9	9	0916	16.7	17.3	29.71	67	2052	.231	1
10	10	0918	16.5	17.5	29.31	67	2051	.206	1
11	11	0920	16.6	17.4	29.51	67	2045	.136	1
12	12	0922	16.7	17.3	29.71	67	2051	.120	1
Blank	13	0924	16.8	17.2	29.91	67	2048	.000	1

STANDARD SOLUTION AND CONTROL SAMPLE
ANALYTICAL DATA FORM

Plant U. S. S. C. Date 12-26-85

Analyst [illegible] Optimum Wavelength 404 nm

Blank used as reference? yes

Sample Number	Sample, Mg	Working solution	Control sample	Measured, absorbance OD	Calculated absorbance,[a] OD	Absorbance comparison error, [b]%
A1	100	x		.151	--	--
A2	200	x		.294	--	--
A3	300	x		.440	--	--
A4	400	x		.553	--	--
S1	100		x	.148	.143	3.5
S2	200		x	.291	.285	2.1
S3	300		x	.438	.428	2.3
						Avg[c] 2.6

$$K_c = 100\left[\frac{A_1+2A_2+3A_3+4A_4}{A_1^2+A_2^2+A_3^2+A_4^2}\right] = \underline{701.7}.$$

[a] Calculated absorbance: OD = (mg)/K_c i.e., S1 calculated absorbance = 100/K_c

[b] Absorbance Comparison errors:

$$\% = 100 \times \frac{\text{(measured absorbance, OD) - (calculated absorbance, OD).}}{\text{calculated absorbance, OD}}$$

[c] Average of absolute values.

OPTIMUM WAVELENGTH DETERMINATION FORM

Spectrophotometer Number 7122 Date 12-26-85

Calibrated by WA Reviewed By ______________

Spectrophotometer setting, nm	Absorbance of standard OD[a]	Absorbance of blank OD[b]	Actual absorbance of OD[c]
399	.279	.012	.267
400	.280	.011	.269
401	.281	.010	.271
402	.282	.009	.273
403	.282	.008	.274
404	.284	.008	.276
405	.283	.008	.275
406	.283	.009	.274
407	.283	.009	.274
408	.283	.010	.273
409	.283	.010	.273
410	.282	.010	.272
411	.282	.011	.271
412	.282	.012	.270
413	.281	.012	.269
414	.281	.013	.268
415	.280	.013	.267
416	.280	.014	.266

[a]Absorbance of the 200 mg NO_2 standard in a single beam spectrophotometer

[b]Absorbance of the blank in a single-beam spectrophotometer

[c]For a single-beam spectrophotometer -- absorbance of the standard minus absorbance of the blank. For a double beam spectrophotometer -- absorbance of the 200 mg NO_2 standard with the blank in the reference cell.

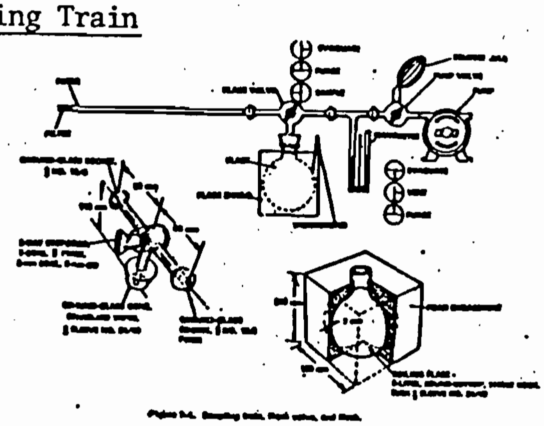
Spectrophotometer setting for maximum actual absorbance of standard 404 nm.

If the maximum actual absorbance occurs at a spectrophotometer setting of $\leq$399 or $\leq$416 nm, the spectrophotometer must be repaired or recalibrated.

FIELD AND ANALYTICAL PROCEDURES
EPA METHOD 7
DETERMINATION OF NITROGEN OXIDE EMISSIONS
FROM STATIONARY SOURCES

All laboratory and field procedures were performed in accordance with EPA Reference Method 7. Calibrations and Quality Assurance was performed as described in the EPA Quality Assurance Manual III.

Nox Sampling Train



OXIDES OF NITROGEN

NOMENCLATURE AND CALCULATIONS

A - ABSORBANCE OF SAMPLE

C - CONCENTRATION OF NOX AS NO2, DRY BASIS, CORRECTED TO STANDARD CONDITIONS. LB./DSCF

F - DILUTION FACTOR (IE;25/5, 25/10, ETC) REQUIRED ONLY IF SAMPLE DILUTION WAS NEEDED TO REDUCE THE ABSORBANCE TO THE RANGE OF CALIBRATION

KC - SPECTROPHOTOMETER CALIBRATION FACTOR

M - MASS OF NOX AS NO2 IN GAS SAMPLE, MG

PF - VOLUMETRIC FLOW RATE, DSCF

PI - INITIAL ABSOLUTE PRESSURE OF FLASK, K ('R)

PSTD - STANDARD ABSOLUTE PRESSURE, 760 MM (29.92 IN.) HG.

TF - FINAL ABSOLUTE TEMPERATURE OF FLASK K ('R)

TI - INITIAL ABSOLUTE TEMPERATURE OF FLASK, K ('R)

TSTD - STANDARD ABSOLUTE TEMPERATURE, 293K (528'R)

VSC - SAMPLE VOLUME AT STANDARD CONDITIONS, DRY BASIS, ML

VF - VOLUME OF FLASK AND VALVE, ML.

VA - VOLUME OF ABSORBING SOLUTION, 25 ML.

E - EMISSION RATE, LBS./HR.

Q - VOLUMETRIC FLOW RATE, DSCF

CALCULATIONS

VS = 17.64 X (VF-25) X ((PF/(TF+460))-(PA/(TA+460))
M = 2 X KC X A X F
C = .00006243 X M/VS
E = 60 X Q X C

Total Gaseous Nonmethane Organics

VOLATILE ORGANIC COMPOUNDS
UNITED STATES SUGAR CORPORATION
BOILER NO. 4 - CLEWISTON
REPORT 859-S

RUN	PPM	Mg/DSCM	LB/DSCF	Qs	LB./HR.
1	459.4	228.8	1.428×10^{-5}	121839	104.4
2	315.8	157.3	9.820×10^{-6}	120511	71.0
3	534.8	266.3	1.663×10^{-5}	120483	120.2
AVERAGE					98.5

REPORT ON ANALYSIS FOR
TOTAL GASEOUS NONMETHANE ORGANICS

AIR CONSULTING & ENGINEERING
GAINESVILLE, FL

CAE Project No: 3554

CLEAN AIR ENGINEERING, INC
Jan 16, 1985

Clean Air Engineering, Inc.

CONTENTS

SUMMARY

OBJECTIVES

Clean Air Engineering was contracted by Air Consulting & Engineering to determine the level of total gaseous nonmethane organic (TGNMO) compounds from samples collected at the U.S. Sugar plant in Florida.

Samples were collected by Air Consulting & Engineering on Dec 23, 1986 and submitted to CAE for analysis on Jan 6, 1986. Analysis was performed on Jan 12, 1986.

CONCLUSIONS

1.) At the #4 boiler/scrubber, TGNMO concentrations ranged from 315.8-534.8 ppmv carbon equivalent.

To the best of our knowledge, the data presented in this report is accurate and complete.

Respectfully submitted,

CLEAN AIR ENGINEERING, INC

Stephanie J Schmidt /BK Barbara Krohn

Stephanie J. Schmidt
Project Engineer

Barbara Krohn
Technical Editor

SJS/BK/lls

355401/84

SUMMARY OF PROCEDURES

SAMPLING PROCEDURES

Field sampling was performed by Air Consulting & Engineering according to Method 25, "Determination of Total Gaseous Nonmethane Organic Emissions as Carbon." This method appears in Title 40 of the Code of Federal Regulations (CFR), Part 60, Subpart A. The sampling train for Method 25 is shown in Fig 1 on page 4-1.

ANALYTICAL PROCEDURES

All samples were analyzed according to EPA Method 25 cited above. Analysis was performed on a Byron Instrumetns Model 401 gas analyzer. This instrument is an automated gas chromatograph that has been modified to meet performance specifications of Method 25. Peak areas were integrated using an Interactive Microware, Inc microcomputer.

The gas analyzer was calibrated with gas containing nominally 78.1 ppm methane, 23.5 ppm propane, 77.9 ppm carbon monoxide and 68.6 ppm carbon dioxide. Calibration was performed before running each sample set. In addition calibration gas containing 1% carbon dioxide was injected daily to monitor catalyst efficiency and system linearity.

QUALITY CONTROL PROCEDURES

Quality control procedures for all aspects of sample preservation and holding time; reagent quality; analytical method; analyst training and safety; and instrument cleaning, calibration and safety were followed.

RESULTS

Results of Method 25 analysis for TGNMO are summarized in accompanying Table 1. Sample calculations are provided in the Appendix along with nomenclature and laboratory data.

Table 1
Analysis for TGNMO

Boiler/ Scubber Location	Run No	Tank	Trap	Vs	Ct	Cc	TGNMO (ppm C)	TGNMO (mg C)
#4	1A	4T21	A40	3119.6	111.3	348.1	459.4	228.8
#4	2A	4T35	A15	2892.4	111.9	204.0	315.8	157.3
#4	3A	4T37	A9	3060.8	189.7	345.1	534.8	266.3

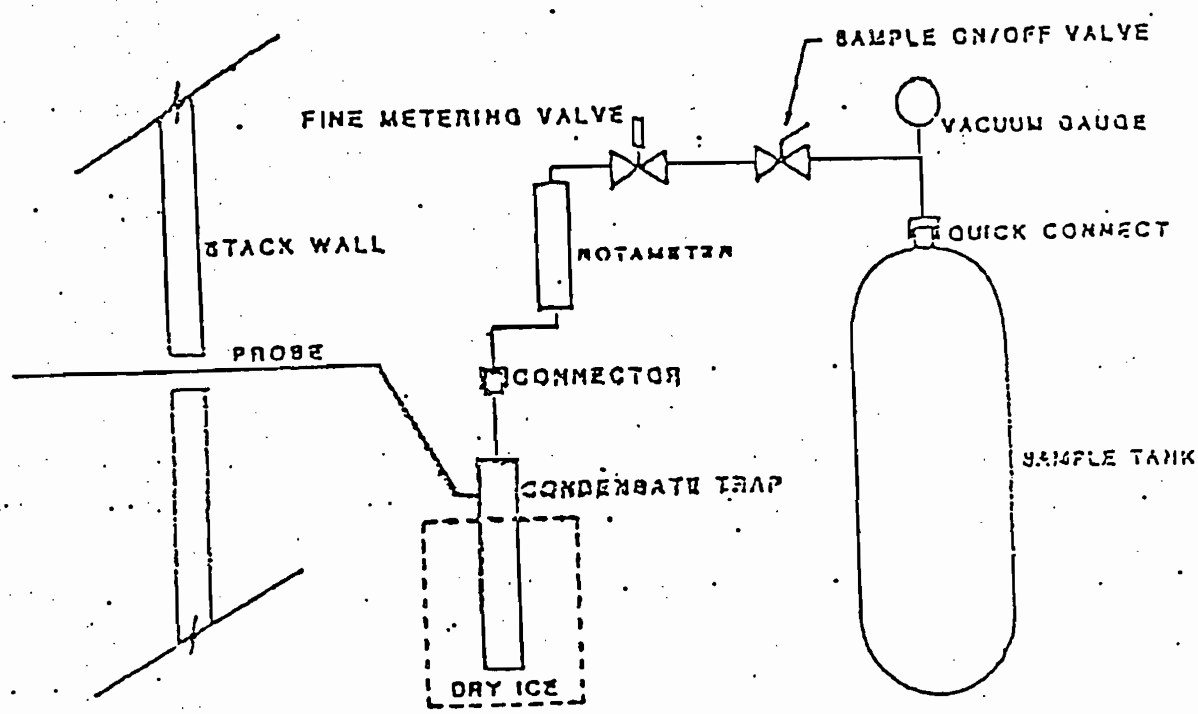


Fig 1. The sampling train for EPA Method 25 is shown.

Method 25 Nomenclature

As -- cross sectional area of sampling plane (ft^2)
Ba -- measured TGNMO analyzer blank value (ppmv C)
Bt -- measured CO_2 blank value for condensate recovery and conditioning system carrier gas (ppmv CO_2)
Bwo-- proportion of water vapor in the gas stream by volume (%)
C -- TGNMO concentration in the effluent (ppmv C equivalent)
Cc -- calculated condensible organic concentration in the condensate trap (ppmv C equivalent)
Ccm-- measured TGNMO for the condensate trap, ICV (ppm CO_2)
Cp -- pitot tube coefficient (dimensionless)
Ct -- calculated noncondensible organic concentration in the effluent (ppmv C equivalent)
Ctm-- measured TGNMO concentration for the sample tank (ppm C equivalent)
Dp -- average of square roots of gas stream velocity heads (in. H_2O)
ICV-- intermediate collection vessel
Kp -- $\frac{[(\text{lb/lb-mole})(\text{in. Hg})]}{[(^\circ\text{R})(\text{in. } H_2O)]}$ = 85.49 ft/sec
Kc -- calibration factor
Mc -- TGNMO mass concentration in the effluent (mg C/dscm)
Md -- dry molecular weight of gas stream (lb/lb-mole)
Ms -- molecular weight of gas stream, wet basis (lb/lb-mole)
Pb -- barometric pressure at test location (mm Hg absolute)
PbF-- barometric pressure after pressurizing sample tank (mm Hg absolute)
PbFf- barometric pressure after pressurizing ICV (mm Hg absolute)
PbI-- barometric pressure prior to sampling (mm Hg absolute)
PF -- final pressure of ICV (mm Hg gauge)
Pf -- final pressure of ICV (mm Hg absolute)
PFI-- initial pressure of ICV (mm Hg gauge)
Ps -- pressure gas stream (in. Hg absolute)
PT -- sample tank pressure after sampling, prior to pressurizing (mm Hg gauge)
Pt -- sample tank pressure after sampling, prior to pressurizing (mm Hg absolute)
PTF-- final sample tank pressure after pressurizing (mm Hg gauge)
Ptf-- final sample tank pressure after pressurizing (mm Hg absolute)
PTI-- sample tank pressure prior to sampling (mm Hg gauge)
Pti-- sample tank pressure prior to sampling (mm Hg absolute)
Qa -- volumetric flow rate, actual conditions
Qs -- volumetric flow rate, standard conditions
Qstd- volumetric flow rate, standard conditions, dry basis
TF -- final temperature of ICV (°F)
Tf -- final temperature of ICV (°K)
TGNMO-total gaseous nonmethane organics

Method 25 Nomenclature (Continued)

TTI-- sample tank temperature prior to sampling (°F)
Tti-- sample tank temperature prior to sampling (°K)
TT -- sample tank temperature at completion of sampling (°F)
Tt -- sample tank temperature at completion of sampling (°K)
TTF-- sample tank temperature after pressurizing (°F)
Ttf-- sample tank temperature after pressurizing (°K)
Ts -- stack temperature (°R)
V -- sample tank volume (cm^3)
Vv -- volume ICV (cm^3)
Vs -- volume gas sampled (dscm)
VS -- velocity gas stream (ft/sec)
n -- number of data points
q -- total number of analyzer injections from ICV
where k = injection number 1.....q
r -- total number of analyzer injections from sample tank
where j = injection number 1 . . . r
Xi -- individual measurements

Method 25 Sample Calculations

All equations are written using absolute pressure in mm Hg. Absolute pressures are determined by adding the measured barometric pressure to the measured gauge pressure. All temperatures are in degrees Kelvin. The following calculations are done using Run 1A.

1.) Sample volume (dscc)

$$Vs = 0.386(V)\left(\frac{pt}{tt} - \frac{pti}{tti}\right)$$

$$= 0.3846(4004)\left(\frac{(-165 + 759)}{289.7} - \frac{(-752 + 761)}{290.8}\right)$$

$$= 3120 \quad cm^3$$

where:
$pt = PT + Pb$
$pti = PTI + PbI$
$tt = 5/9(TT - 32) + 273$
$tti = 5/9(TTI - 32) + 273$

2. Noncondensible organics (ppmv C equivalent)

$$Ct = \frac{\dfrac{ptf}{ttf}}{\dfrac{pt}{tt} - \dfrac{pti}{tti}}\left(\frac{1}{r}\left(\sum_{j=1}^{r} Ctm_j\right) - Ba\right)$$

$$= \frac{\dfrac{(762 + 816)}{295.8}}{\dfrac{(-165 + 759)}{289.7} - \dfrac{(-752 + 761)}{290.8}}$$

$$\times \quad [1/3\ [42.7 + 42.7 + 42.5] - 0.5]$$

$$= 111$$

where:
$ptf = PTF + PbF$
$ttf = 5/9(TTF - 32) + 273$

Appendix

3. Condensible organics (ppmv C equivalent)

$$Cc = 0.386 \frac{(Vv)(pf)}{(Vs)(tf)} \left(\frac{1}{q} \left(\sum_{k=1}^{q} Ccm_k\right) - Bt\right)$$

$$= 0.3846 \frac{(4011)(763 + 864)}{(3120)\ (296.9)}$$

$$x\ [1/3[140.6 + 141.2 + 141.7] - 13.1]$$

$$= 348 \text{ ppm}$$

where: $pf = (PF + PbFf)$
$tf = 5/9(TF - 32) + 273$

4. Total gaseous nonmethane organics, TGNMO (ppmv C equivalent)

$$C = (Ct) + (Cm)$$

$$= (348) + (111)$$

$$= 459 \text{ ppm}$$

5. Total gaseous nonmethane organics, TGNMO (mg C/dscm)

$$Mc = 0.498(C)$$

$$= 0.498(459)$$

$$= 229 \text{ mg C/dscm}$$

BEST AVAILABLE COPY

Job No.		Plant	U.S. SUGAR
Client	AOC, Inc.	Sampling Location	BOILER FOUR
Report No.		Date	DEC. 23, 1985

Preliminary Data

Run No.		1A	2A	3A
Tank No.		21	35	37
Trap No.		40	15	3
Tank Volume, V	(cc)	4004	4043	4006

Field Data

PTI	(mmHg)	-752	-750	-750
TTI	(F)	64	64	63
PbI	(mmHg)	761	761	759
PT	(mmHg)	-165	-214	-183
TT	(F)	62	53	56
Pb	(mmHg)	759	759	759

Lab Data

Noncondensible Organics

PTF	(mmHg)	816	814	836
TTF	(F)	73	75	73
PbF	(mmHg)	762	761	762
Ba	(ppmv C)	.5	.5	.5
Ctm 1	(ppmv C)	42.7	39.8	70.0
Ctm 2	(ppmv C)	42.7	39.6	70.0
Ctm 3	(ppmv C)	42.5	39.4	70.1
Avg. Ctm	(ppmv C)	42.6	39.6	70.0
Std. Dev. Ctm		.08	.14	.04
Ct	(ppmv C)	111.3	111.9	189.7

Condensible Organics

ICV Tank No.		41	46	32
ICV Tank, Vv	(cc)	4011	3922	4011
PF	(mmHg)	864	873	856
TF	(F)	73	75	72
PbFf	(mmHg)	763	760	762
Bt	(ppmv C)	13.1	13.1	13.1
Ccm 1	(ppmv C)	140.6	84.1	138.0
Ccm 2	(ppmv C)	141.2	84.3	138.0
Ccm 3	(ppmv C)	141.7	83.6	137.7
Avg. Ccm	(ppmv C)	141.2	84.0	137.9
Std. Dev. Ccm		.39	.25	.12
Cc	(ppmv C)	343.1	204.0	345.1

Total Gaseous Nonmethane Organics (TGNMO)

Vs	(cc)	3119.6	2892.4	3060.8
Ct+Cc=C	(ppmv C)	453.4	315.9	534.9
Mc	(mg C/dscm)	226.8	157.9	266.3

JOB#		M25 ANAL.	PLANT: U.S. Sugar
CLIENT	Air Consultants		CITY,STATE:
REPORT#			SMPLE LOC.: #4 Boiler/Scrubber
PAGE#			SMPLE OPR.: Neck
			SMPLE DATE: 12/23/85

IDENTIFICATION ITEM	UNITS	RAW DATA	COMP. DATA	RAW DATA	COMP. DATA	RAW DATA	COMP. DATA
RUN	ID #	XXXXXXXXXXX	3A	XXXXXXXXXXX	3B	XXXXXXXXXXX	BLANK
TANK	ID #	XXXXXXXXXXX	4T37	XXXXXXXXXXX	4T42	XXXXXXXXXXX	~~4T40~~ 4T52
TRAP	ID #	XXXXXXXXXXX	A9	XXXXXXXXXXX	A52	XXXXXXXXXXX	A40
FIELD DATA							
V	ml	XXXXXXXXXXX		XXXXXXXXXXX		XXXXXXXXXXX	4018
PTI	mmHg	(/)-	-750	(/)-	-748	(/)-	-
TTI	deg F		63		63		
PbI	mmHg	( )-	759	( )-	759	( )-	
PT	mmHg	(/)-	-183	(/)-	-421	(/)-	-
TT	deg F		56		56		
PbT	mmHg	( )-	759	( )-	759	( )-	
LAB DATA							
PURGE							
PT	mmHg	(74 /180)	-154	(/)	-	(366/372)	-733
TT	deg F		73				64
PbT	mmHg	( )	762	( )		( )	751
discr.	+/-mls		XXXXX		XXXXX		XXXXX
PTF	mmHg	(416 /420)		(/)		(425/419)	
TTF	deg F		73				64
PbF	mmHg	( )	762	( )		( )	751
BURN							
ICV	tank#	XXXXXXXXXXX	4T32	XXXXXXXXXXX		XXXXXXXXXXX	4T9
VV	ml	XXXXXXXXXXX		XXXXXXXXXXX		XXXXXXXXXXX	4066
PFI	mmHg	(372 /378)	-750	(/)	-	(360/365)	-725
TFI	deg F		73				65
PbFi	mmHg	( )	762	( )		( )	751
PF	mmHg	(430 /426)	856	(/)		(424/418)	842
TF	deg F		73				70
PbFf	mmHg	( )	762	( )		( )	751
BA	ppmC	XXXXXXXXXXX		XXXXXXXXXXX		XXXXXXXXXXX	
BT	ppmC	XXXXXXXXXXX		XXXXXXXXXXX		XXXXXXXXXXX	
DATE/OPERATOR			XXXXX		XXXXX		XXXXX
ANALYSIS DATA							
CTM 1	ppmC	XXXXXXXXXXX	70.0	XXXXXXXXXXX		XXXXXXXXXXX	.6
CTM 2	ppmC	XXXXXXXXXXX	70.0	XXXXXXXXXXX		XXXXXXXXXXX	.5
CTM 3	ppmC	XXXXXXXXXXX	70.1	XXXXXXXXXXX		XXXXXXXXXXX	.5
CTMavg.	ppmC		XXXXX		XXXXX		XXXXX
CTMrsd.	%		XXXXX		XXXXX		XXXXX
PGE STD.	FILE	P1/12	XXXXX		XXXXX	P1/13/85	XXXXX
DATE/OPERATOR		STS 1/12	XXXXX		XXXXX	1/13/85 ALS	XXXXX
CCM 1	ppmC	XXXXXXXXXXX	138.0	XXXXXXXXXXX		XXXXXXXXXXX	13.7
CCM 2	ppmC	XXXXXXXXXXX	138.0	XXXXXXXXXXX		XXXXXXXXXXX	12.8
CCM 3	ppmC	XXXXXXXXXXX	137.7	XXXXXXXXXXX		XXXXXXXXXXX	12.8
CCMavg.	ppmC		XXXXX		XXXXX		XXXXX
CCMrsd.	%		XXXXX		XXXXX		XXXXX
BRN STD.	FILE	B1/12	XXXXX		XXXXX	B1/13/85	XXXXX
DATE/OPERATOR		STS 1/12	XXXXX		XXXXX	1/13/85 ALS	XXXXX

COMMENTS:

JOB#		M25 ANAL.	PLANT: U.S. Sugar
CLIENT	Air Consultants		CITY,STATE:
REPORT#			SMPLE LOC.: #4 Boiler
PAGE#			SMPLE OPR.: Neck
			SMPLE DATE: 12/23/85

IDENTIFICATION ITEM	UNITS	RAW DATA	COMP. DATA	RAW DATA	COMP. DATA	RAW DATA	COMP. DATA
RUN	ID #	XXXXXXXXXXX	1A	XXXXXXXXXXX	1B	XXXXXXXXXXX	
TANK	ID #	XXXXXXXXXXX	4T21	XXXXXXXXXXX	4T50	XXXXXXXXXXX	
TRAP	ID #	XXXXXXXXXXX	A40	XXXXXXXXXXX	A50	XXXXXXXXXXX	
FIELD DATA							
V	ml	XXXXXXXXXXX		XXXXXXXXXXX		XXXXXXXXXXX	
PTI	mmHg	(/)-	-752	(/)-	-751	(/)-	-
TTI	deg F		64		64		
PbI	mmHg	( )-	761	( )-	761	( )-	
PT	mmHg	(/)-	-605	(/)-	-561	(/)-	-
TT	deg F		62		62		
PbT	mmHg	( )-	759	( )-	759	( )-	
LAB DATA PURGE							
PT	mmHg	(600/606)	-426	(/)	-	(/)	-
TT	deg F		73				
PbT	mmHg	( )	762	( )		( )	
discr.	+/-mls		XXXXX		XXXXX		XXXXX
PTF	mmHg	(411/405)	816	(/)		(/)	
TTF	deg F		73				
PbF	mmHg	( )	762	( )		( )	
BURN							
ICV	tank#	XXXXXXXXXXX	4T41	XXXXXXXXXXX		XXXXXXXXXXX	
VV	ml	XXXXXXXXXXX		XXXXXXXXXXX		XXXXXXXXXXX	
PFI	mmHg	(372/377)	-749	(/)	-	(/)	-
TFI	deg F		73				
PbFi	mmHg	( )	762	( )		( )	
PF	mmHg	(435/429)	864	(/)		(/)	
TF	deg F		75				
PbFf	mmHg	( )	763	( )		( )	
[illegible]A	ppmC	XXXXXXXXXXX		XXXXXXXXXXX		XXXXXXXXXXX	
[illegible]T	ppmC	XXXXXXXXXXX		XXXXXXXXXXX		XXXXXXXXXXX	
DATE/OPERATOR			XXXXX		XXXXX		XXXXX
ANALYSIS DATA							
CTM 1	ppmC	XXXXXXXXXXX	42.7	XXXXXXXXXXX		XXXXXXXXXXX	
CTM 2	ppmC	XXXXXXXXXXX	42.7	XXXXXXXXXXX		XXXXXXXXXXX	
CTM 3	ppmC	XXXXXXXXXXX	42.5	XXXXXXXXXXX		XXXXXXXXXXX	
CTMavg.	ppmC		XXXXX		XXXXX		XXXXX
CTMrsd.	%		XXXXX		XXXXX		XXXXX
PGE STD.	FILE	P 1/12	XXXXX		XXXXX		XXXXX
DATE/OPERATOR		SJS 1/12	XXXXX		XXXXX		XXXXX
CCM 1	ppmC	XXXXXXXXXXX	140.6	XXXXXXXXXXX		XXXXXXXXXXX	
CCM 2	ppmC	XXXXXXXXXXX	141.2	XXXXXXXXXXX		XXXXXXXXXXX	
CCM 3	ppmC	XXXXXXXXXXX	141.7	XXXXXXXXXXX		XXXXXXXXXXX	
CCMavg.	ppmC		XXXXX		XXXXX		XXXXX
CCMrsd.	%		XXXXX		XXXXX		XXXXX
BRN STD.	FILE	B 1/12	XXXXX		XXXXX		XXXXX
DATE/OPERATOR		SJS 1/12	XXXXX		XXXXX		XXXXX

COMMENTS:

VOLATILE ORGANIC CARBON

FACILITY ____ SAMPLE LOCATION # 4 BOILER
LOCATION U.S. SUGAR - CLEWISTON OPERATOR NECK
DATE 12-23-85 RUN NUMBER 1
TANK NUMBER 4T21 TRAP NUMBER A 40 SAMPLE ID NUMBER 1A

	TANK VACUUM, Hg	, Hg	BAROMETRIC PRESSURE, Hg	AMBIENT TEMPERATURE, °
PRETEST (MANOMETER)	~~40~~ 29.85	(GAUGE) 30	30.21	64
POST TEST (MANOMETER)	~~20.25~~ 6.55	(GAUGE) 7.0	30.14	62

LEAK RATE ____ Hg / 10 min

START 1406

PRETEST 0.00

POST TEST ____

TIME CLOCK/SAMPLE	GAUGE VACUUM, Hg	FLOWMETER SETTING	COMMENTS
1411	~~28~~ 27	75	
1416	24	~~23~~ 75	
1421	22	75	PLUGGED FOR ABOUT
1426	20	75	30 SEC.
1431	17	75	
1436	15	75	
1441	13	75	
1446	9.5	75	
1451	7.0	75	

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VOLATILE ORGANIC CARBON

FACILITY U S Sugar SAMPLE LOCATION # 4 Boiler

LOCATION Clewiston, FL. OPERATOR Neck

DATE 12-23-85 RUN NUMBER 1

TANK NUMBER 4T50 TRAP NUMBER A50 SAMPLE ID NUMBER 1B

	TANK VACUUM, Hg	, Hg	BAROMETRIC PRESSURE, Hg	AMBIENT TEMPERATURE, °
PRETEST (MANOMETER)	29.8	(GAUGE) 29	30.21	64
POST TEST (MANOMETER)	22.25	(GAUGE) 22	30.14	62

LEAK RATE Hg / 10 min

START 1406 PRETEST 0.00

POST TEST

TIME CLOCK/SAMPLE	GAUGE VACUUM, Hg	FLOWMETER SETTING	COMMENTS
1411	26	75	
1416	23	75	
1421	22	75	(Down) Some with plug
1423	22		Stop 1423
			Won't clear with
			heat. I think
			trap is plumbed
			backwards (probe
			is attached to
			outlet instead of
			inlet.)

Clean Air Engineering, Inc.

VOLATILE ORGANIC CARBON

FACILITY U.S. Sugar SAMPLE LOCATION Boiler 4 Scrubber Stack

LOCATION Clewiston, Fl OPERATOR Neck

DATE 12-23-85 RUN NUMBER 2

TANK NUMBER 4T35 TRAP NUMBER A15 SAMPLE ID NUMBER 2A

	TANK VACUUM, "Hg	"Hg	BAROMETRIC PRESSURE, "Hg	AMBIENT TEMPERATURE, °
PRETEST (MANOMETER)	29.75	(GAUGE) 29	30.21	64
POST TEST (MANOMETER)	~~12.90~~ 8.5	(GAUGE) 9	30.14	59

LEAK RATE "Hg / 10 min

START 1604 PRETEST 0.0

POST TEST

TIME CLOCK/SAMPLE	GAUGE VACUUM, "Hg	FLOWMETER SETTING	COMMENTS
1609	26	90	
1614	23	90	
1619	20	90	
1624	17	90	
1629	14	90	
1634	11	90	
1639	9	90-85	Can't Maintain flow any longer

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VOLATILE ORGANIC CARBON

FACILITY U.S. Sugar SAMPLE LOCATION Unit 4 Scrubber
LOCATION Clewiston, Fla OPERATOR Neck
DATE 12-23-85 RUN NUMBER 2
TANK NUMBER 4725 TRAP NUMBER A-45 SAMPLE ID NUMBER 2B

	TANK VACUUM, Hg		, Hg	BAROMETRIC PRESSURE, Hg	AMBIENT TEMPERATURE, °
PRETEST (MANOMETER)	29.80	(GAUGE)	30	30.21	64
POST TEST (MANOMETER)	12.9	(GAUGE)	13	30.14	59

LEAK RATE Hg / 10 min

1604 START PRETEST

POST TEST

TIME CLOCK/SAMPLE	GAUGE VACUUM, Hg	FLOWMETER SETTING	COMMENTS
1609	26 ~~28~~	90	
1614	24	90	
1619	21	90	
1624	19	90	
1629	17	90	
1634	15	90	
1639	13	90-85	Can't maintain flow any longer

Clean Air Engineering, Inc.

VOLATILE ORGANIC CARBON

FACILITY U.S. SUGAR
SAMPLE LOCATION UNIT 4
LOCATION CLEWISTON, FL.
OPERATOR NECK
DATE 12-23-85
RUN NUMBER 3
TANK NUMBER 4T37
TRAP NUMBER A-9
SAMPLE ID NUMBER 3A

ETA	TANK VACUUM, Hg		Hg	BAROMETRIC PRESSURE, Hg	AMBIENT TEMPERATURE, °
PRETEST (MANOMETER)	29.75	(GAUGE)	30	30.14	63
POST TEST (MANOMETER)	1.25	(GAUGE)	7.5	30.14	56

LEAK RATE Hg / 10 min

START 1750
PRETEST 0.0
POST TEST

TIME CLOCK/SAMPLE	GAUGE VACUUM, Hg	FLOWMETER SETTING	COMMENTS
1755	26	90	
1800	24	90	
1805	21	90	
1810	19	90	
1815	16	90	
1820	13	90	STOP FOR P.M. TEST
RESTART 1851		90	
1856	10	90	
1901	7.5	90-80	Can't maintain
			flow - and

Clean Air Engineering, Inc.

VOLATILE ORGANIC CARBON

FACILITY U.S. Sugar SAMPLE LOCATION Unit 4
LOCATION CLEWISTON, FL. OPERATOR Neek
DATE 12-23-85 RUN NUMBER 3
TANK NUMBER 4T42 TRAP NUMBER A-52 SAMPLE ID NUMBER 3B

	TANK VACUUM, Hg		BAROMETRIC PRESSURE, Hg	AMBIENT TEMPERATURE, °
PRETEST (MANOMETER)	29.70	(GAUGE) 29	30.14	63
POST TEST (MANOMETER)	[illegible]	(GAUGE) 17	~~[illegible]~~ 30.14	56

LEAK RATE Hg / 10 min

START 1750 PRETEST

POST TEST

TIME CLOCK/SAMPLE	GAUGE VACUUM, Hg	FLOWMETER SETTING	COMMENTS
1755	27	90	
1800	26	90	
1805	25	90	
1810	24	90	
1815	22.5	90	
1820	21.5	90	STOP FOR PM TEST
RESTART 1851		70	Can't maintain
1856	18	70	flow - Strange
1901	17	End 60	problems, Flow
			meter shows ≈ 20
			ccm WITH VALVE
			OFF - Only 70
			all the way open

Clean Air Engineering, Inc.

Process Data

PROCESS DATA

COMPANY USSC - Clewiston INSTALLATION Boiler No 4

DATE Dec 23, 1985 REPORT NO. 8595

TYPE OF INSTALLATION Steam Generator

TYPE OF MATERIAL PROCESSED Steam

TYPE(S) OF FUEL USED Bagasse

TYPE OF POLLUTION CONTROL SYSTEM Impingment Scrubber

GENERAL CONDITION OF CONTROL EQUIPMENT Normal

	NORMAL	RUN 1	RUN 2	RUN 3
FUEL USED	Bagasse	Bagasse	Bagasse	Bagasse
SCRUBBER WATER FLOW RATE	460 GPM	460	460	460
PRESSURE DROP (INCHES)	7.0	7.0	7.5	7.5
TOTAL OPERATING CURRENT	n/A	n/A	n/A	n/A
MATERIALS PROCESSED	Steam	Steam	Steam	Steam

COMPANY REPRESENTATIVE Ben F. Sanford, Jr.

TITLE Supv. Special Projects

PH of No. 4 Scrubber Discharge Water

Date 12-23-85

Test 1	PH.	solids	Name
start 9:00 AM	8.0	1%	Jeff Mathis
9:15	7.9	2%	Jeff Mathis
9:30	7.8	1%	Jeff Mathis
9:45	7.8	1%	Jeff Mathis
stop - 10:00	7.8	0%	Jeff Mathis
10:15			
10:30			
10:45			
11:00	7.6	0%	Jeff Mathis
11:15			
11:30			
11:45			
Noon - 12:00	7.8	0%	Jeff Mathis
12:15			
12:30			
12:45			
1:00	7.8	1%	Jeff Mathis
1:15			
1:30			
1:45			
2:00	7.8	1%	Jeff Mathis
2:15			
2:30			
2:45			
3:00	7.8	0%	Jeff Mathis
3:15			
3:30			
3:45			
4:00	-7.9-	2%	Tony Varnum
4:15	-7.9	2%	Tony Varnum
4:30	-7.8	2%	Tony Varnum
4:45	7.5	2%	Tony Varnum
5:00	7.8	1%	Tony Varnum
5:15	7.9	2%	Tony Varnum
5:30	7.8	2%	Tony Varnum

12/23/85

No. 4 Boiler Scrubber Tests

Time	Δ P Scrubber	Water Pressure	Water Flow
9:00 AM	7.0" H_2O	80 PSI	490 GPM
9:15	7.0"	84	480
9:30	7.0"	86	480
9:45	7.0"	88	480
10:00	7.0"	88	490
10:15	7.0"	85	470
10:30	7.0"	90	460
10:45	7.0"	94	470
11:00	7.0"	84	460
11:15	7.0"	84	470
11:30	7.0"	88	460
11:45	7.0"	85	460
12:00 N	7.0"	80	465
12:15 PM	7.0"	80	470
12:30	7.0"	80	470
12:45	7.0"	76	470
1:00	7.0"	80	470
1:15	7.0"	85	470
1:30	7.0"	85	470
1:45	7.0"	85	480
2:00	7.5"	82	470
2:15	7.5"	81	465
2:30	7.5"	89	465
2:45	7.5"	78	465
3:00	7.5"	84	465

[illegible] 12-23-85

Recorded By: Ben F. Sanford, Jr.

PH	SOLIDS	NAME
7.8	2%	TONY VARNUM
7.8	1%	TONY VARNUM
7.9	1%	TONY VARNUM
7.7	1%	TONY VARNUM
7.8	1%	TONY VARNUM
7.7	1%	TONY VARNUM

12/23/85 — No. 4 Boiler Scrubber

Time	ΔP Scrubber	Water Pressure	Water Flow
3:15 PM	7.5" H_2O	88 PSI	465 GPM
3:30 PM	7.5"	91	465
3:45	7.5"	87	465
4:00	7.5"	87	470
4:15	7.5"	87	465
4:30	7.5"	84	465
4:45	7.5"	84	460
5:00	7.5"	85	465
5:15	7.5"	84	465
5:30	7.5"	85	470
5:45	7.5"	84	465
6:00	7.5"	84	465
6:15	7.5"	84	465
6:30	7.5"	84	470
6:45	7.5"	84	470
7:00	7.5"	84	470
7:15	7.5"	85	475
7:30	7.5"	84	475
7:45	7.5"	84	470
8:00	7.5"	83	470
8:15	7.5"	85	470
8:30	7.5"	85	470
8:45	7.5"	85	470
9:00	7.5"	84	470

[illegible signature] 12-23-85

Recorded By Ben F Sanford Jr.

Best Available Copy

BOILER DATA SHEET

COMPANY USSC - Clewiston | BOILER NUMBER 4

DATE Dec. 23, 1985 | REPORT NO. 8595

INTEGRATOR FACTOR 35-00 | OIL METER FACTOR 120

			STEAM			FEED WATER		
TIME	INTEGRATOR	OIL METER	FLOW	TEMP.	PRESSURE	TEMP.	PRESSURE	
8:59	[illegible]	[illegible]	265	765	600	240	900	
914			262	770	610	240	900	
929			265	765	600	[illegible]	[illegible]	
944			260	765	625	24[illegible]	[illegible]	
10:03	[illegible]	859946	250	765	620	240	580	
		(1386.9)		765	620 Psig	240	900 Psig	210.6
~~412~~	~~[illegible]~~	~~85[illegible]~~	~~262~~	~~770~~	~~610~~	~~250~~	~~900~~	
4:27	969812	859946	264	760	610	254	890	
4:42	969831		260	760	610	252	890	
457	[illegible]		260	760	610	254	8[illegible]	
512	969867		260	760	600	254	[illegible]	
527	969888	859946	250	760	610	252	880	
~~531~~	~~[illegible]~~		~~250~~	~~760~~	~~580~~	~~250~~	~~[illegible]~~	
		(1384.0)		760	620	250	900	220.6
735	970042	859946	250	760	620	254	[illegible]	
750			250	760	600	254	[illegible]	
806	[illegible]							
816	970090		250	760	570	256	[illegible]	
8:31			250	760	570	254	900	
846	970138	859946	251	760	570	254	910	
856		(1385.1)		760	600 Psig	250	900	220.6

[signature]

SIGNED Witnessed By [signature]

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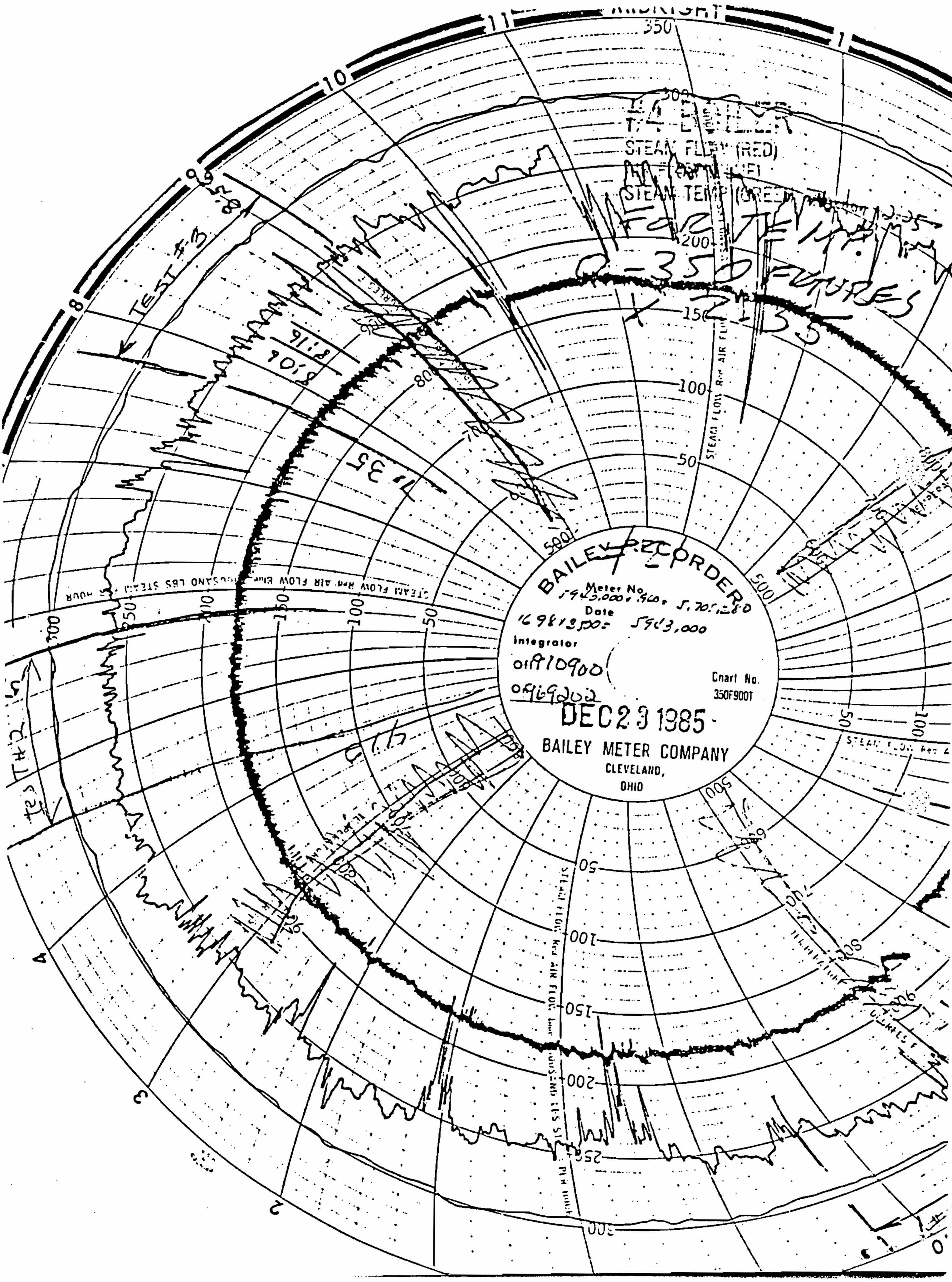

ASME Efficiency Determination

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SUMMARY SHEET

ASME TEST FORM FOR ABBREVIATED EFFICIENCY TEST

PTC 4.1-a (1964)

TEST NO	1
BOILER NO.	4
DATE	23/12/85
OWNER OF PLANT	United States Sugar Corporation
LOCATION	Clewiston, Florida
TEST CONDUCTED BY	United States Sugar Corporation
OBJECTIVE OF TEST	
DURATION	
BOILER MAKE & TYPE	Foster Wheeler Two Drum, Superheater, Water Walls
RATED CAPACITY	250,000 pph
STOKER TYPE & SIZE	Detroit Stoker, Rotograte, 505 sq. ft. surface
PULVERIZER, TYPE & SIZE	
BURNER, TYPE & SIZE	
FUEL USED	Bagasse
MINE	
COUNTY	Hendry
STATE	Florida
SIZE AS FIRED	

PRESSURES & TEMPERATURES

1	STEAM PRESSURE IN BOILER DRUM	psia	643
2	STEAM PRESSURE AT S. H. OUTLET	psia	615
3	STEAM PRESSURE AT R. H. INLET	psia	
4	STEAM PRESSURE AT R. H. OUTLET	psia	
5	STEAM TEMPERATURE AT S. H. OUTLET	F	820
6	STEAM TEMPERATURE AT R H INLET	F	
7	STEAM TEMPERATURE AT R.H. OUTLET	F	
8	WATER TEMP. ENTERING (ECON.)(BOILER)	F	258
9	STEAM QUALITY % MOISTURE OR P.P.M.		
10	AIR TEMP. AROUND BOILER (AMBIENT)	F	80
11	TEMP AIR FOR COMBUSTION (This is Reference Temperature) †	F	80
12	TEMPERATURE OF FUEL	F	
13	GAS TEMP. LEAVING (Boiler) (Econ.) (Air Htr.)	F	366
14	GAS TEMP. ENTERING AH (If conditions to be corrected to guarantee)	F	535

UNIT QUANTITIES

15	ENTHALPY OF SAT. LIQUID (TOTAL HEAT)	Btu/lb	226.72
16	ENTHALPY OF (SATURATED) (SUPERHEATED) STM.	Btu/lb	1,417.8
17	ENTHALPY OF SAT. FEED TO (BOILER) (ECON.)	Btu/lb	
18	ENTHALPY OF REHEATED STEAM R.H. INLET	Btu/lb	
19	ENTHALPY OF REHEATED STEAM R. H. OUTLET	Btu/lb	
20	HEAT ABS/LB OF STEAM (ITEM 16 - ITEM 17)	Btu/lb	
21	HEAT ABS/LB R.H. STEAM (ITEM 19 - ITEM 18)	Btu/lb	
22	DRY REFUSE (ASH PIT + FLY ASH) PER LB AS FIRED FUEL	lb/lb	.0267
23	Btu PER LB IN REFUSE (WEIGHTED AVERAGE)	Btu/lb	7955
24	CARBON BURNED PER LB AS FIRED FUEL	lb/lb	
25	DRY GAS PER LB AS FIRED FUEL BURNED	lb/lb	

HOURLY QUANTITIES

26	ACTUAL WATER EVAPORATED	lb/hr	
27	REHEAT STEAM FLOW	lb/hr	
28	RATE OF FUEL FIRING (AS FIRED wt)	lb/hr	
29	TOTAL HEAT INPUT (Item 28 x Item 41) / 1000	kB/hr	
30	HEAT OUTPUT IN BLOW-DOWN WATER	kB/hr	
31	TOTAL HEAT OUTPUT (Item 26 x Item 20) + (Item 27 x Item 21) + Item 30 / 1000	kB/hr	

FLUE GAS ANAL. (BOILER)(ECON)(AIR HTR) OUTLET

32	CO_2	% VOL	14.06
33	O_2	% VOL	6.84
34	CO	% VOL	–
35	N_2 (BY DIFFERENCE)	% VOL	79.10
36	EXCESS AIR	%	44.00

FUEL DATA

	COAL AS FIRED PROX. ANALYSIS	% wt
37	MOISTURE	53.7
38	VOL MATTER	39.63
39	FIXED CARBON	5.72
40	ASH	0.95
	TOTAL	100.00
41	Btu per lb AS FIRED	3,683
42	ASH SOFT TEMP.* ASTM METHOD	

	COAL OR OIL AS FIRED ULTIMATE ANALYSIS	
43	CARBON	22.31
44	HYDROGEN	2.82
45	OXYGEN	20.06
46	NITROGEN	.13
47	SULPHUR	.01
40	ASH	.95
37	MOISTURE	53.7
	TOTAL	100.00

	COAL PULVERIZATION	
48	GRINDABILITY INDEX*	
49	FINENESS % THRU 50 M*	
50	FINENESS % THRU 200 M*	
64	INPUT-OUTPUT EFFICIENCY OF UNIT % = ITEM 31 x 100 / ITEM 29	

	OIL	
51	FLASH POINT F*	
52	Sp. Gravity Deg. API*	
53	VISCOSITY AT SSU* BURNER SSF	
44	TOTAL HYDROGEN % wt	
41	Btu per lb	

	GAS	% VOL
54	CO	
55	CH_4 METHANE	
56	C_2H_2 ACETYLENE	
57	C_2H_4 ETHYLENE	
58	C_2H_6 ETHANE	
59	H_2S	
60	CO_2	
61	H_2 HYDROGEN	
	TOTAL	
	TOTAL HYDROGEN % wt	
62	DENSITY 68 F ATM. PRESS.	
63	Btu PER CU FT	
41	Btu PER LB	

	HEAT LOSS EFFICIENCY	Btu/lb A. F. FUEL	% of A. F. FUEL
65	HEAT LOSS DUE TO DRY GAS	260.76	7.08
66	HEAT LOSS DUE TO MOISTURE IN FUEL	631.03	17.13
67	HEAT LOSS DUE TO H_2O FROM COMB OF H_2	298.24	8.09
68	HEAT LOSS DUE TO COMBUST. IN REFUSE	212.39	5.76
69	HEAT LOSS DUE TO RADIATION	–	.53
70	UNMEASURED LOSSES	8.37	.22
71	TOTAL		38.81
72	EFFICIENCY = (100 – Item 71)		61.19

* Not Required for Efficiency Testing

† For Point of Measurement See Par. 7.2.8.1-PTC 4.1-1964

Printed in U.S.A. (10/74)

This Test Form (C-36) may be obtained from ASME, 345 E. 47 St., New York, N.Y. 10

ASME TEST FORM

CALCULATION SHEET — FOR ABBREVIATED EFFICIENCY TEST — *Revised September, 1965*

OWNER OF PLANT United States Sugar Corp. TEST NO. 1 BOILER NO. 4 DATE 23/12/8[illegible]

30 HEAT OUTPUT IN BOILER BLOW-DOWN WATER = LB OF WATER BLOW-DOWN PER HR × $\left[\dfrac{\text{ITEM 15} - \text{ITEM 17}}{1000}\right]$ = ... lb/hr

If impractical to weigh refuse, this item can be estimated as follows

24 DRY REFUSE PER LB OF AS FIRED FUEL = $\dfrac{\text{\% ASH IN AS FIRED COAL}}{100 - \text{\% COMB. IN REFUSE SAMPLE}}$

CARBON BURNED PER LB AS FIRED FUEL = $\dfrac{\text{ITEM 43}}{100}$ $- \left[\dfrac{\text{ITEM 22} \times \text{ITEM 23}}{14{,}500}\right]$ = $\dfrac{22.31}{100} - \left[\dfrac{.0267 \times 7955}{14{,}500}\right]$ = .2085

.0146

NOTE: IF FLUE DUST & ASH PIT REFUSE DIFFER MATERIALLY IN COMBUSTIBLE CONTENT, THEY SHOULD BE ESTIMATED SEPARATELY. SEE SECTION 7, COMPUTATIONS.

25 DRY GAS PER LB AS FIRED FUEL BURNED = $\dfrac{11CO_2 + 8O_2 + 7(N_2 + CO)}{3(CO_2 + CO)}$ × (LB CARBON BURNED PER LB AS FIRED FUEL + $\frac{3}{8}$ S)

$= \dfrac{11 \times \underset{\text{ITEM 32}}{14.06} + 8 \times \underset{\text{ITEM 33}}{6.84} + 7\left(\underset{\text{ITEM 35}}{79.1} + \underset{\text{ITEM 34}}{0}\right)}{3 \times \left(\underset{\text{ITEM 32}}{14.06} + \underset{\text{ITEM 34}}{0}\right)} \times \left[\underset{\text{ITEM 24}}{.2085} + \dfrac{\underset{\text{ITEM 47}}{.01}}{267}\right]$ = 3.799 lbs.

36 EXCESS AIR[1] = $100 \times \dfrac{O_2 - \frac{CO}{2}}{.2682N_2 - \left(O_2 - \frac{CO}{2}\right)}$ = $100 \times \dfrac{\text{ITEM 33} - \frac{\text{ITEM 34}}{2}}{.2682(\text{ITEM 35}) - \left(\text{ITEM 33} - \frac{\text{ITEM 34}}{2}\right)}$ = ...

	HEAT LOSS EFFICIENCY	Btu/lb AS FIRED FUEL	LOSS HHV × 100 =	LOSS %
65	HEAT LOSS DUE TO DRY GAS = LB DRY GAS PER LB AS FIRED FUEL × C_p × ($t_{lvg} - t_{air}$) = ITEM 25 × 0.24 (ITEM 13) − (ITEM 11) = 3.799 × 0.24 (366 − 80) = ...	260.76	$\frac{65}{41}$ × 100 = 3688	7.08
66	HEAT LOSS DUE TO MOISTURE IN FUEL = LB H_2O PER LB AS FIRED FUEL × [(ENTHALPY OF VAPOR AT 1 PSIA & T GAS LVG) − (ENTHALPY OF LIQUID AT T AIR)] = $\frac{\text{ITEM 37}}{100}$ × [(ENTHALPY OF VAPOR AT 1 PSIA & T ITEM 13) − (ENTHALPY OF LIQUID AT T ITEM 11)] = ... 1223.2 48.09	631.0[illegible]	$\frac{66}{41}$ × 100 = 3683	17.13
67	HEAT LOSS DUE TO H_2O FROM COMB. OF H_2 = $9H_2$ × [(ENTHALPY OF VAPOR AT 1 PSIA & T GAS LVG) − (ENTHALPY OF LIQUID AT T AIR)] = 9 × $\frac{\text{ITEM 44}}{100}$ × [(ENTHALPY OF VAPOR AT 1 PSIA & T ITEM 13) − (ENTHALPY OF LIQUID AT T ITEM 11)] = ... 2.82 1223.2 48.09	298.24	$\frac{67}{41}$ × 100 = 3683	8.09
68	HEAT LOSS DUE TO COMBUSTIBLE IN REFUSE = ITEM 22 × ITEM 23 = .0267 × 7955 = ...	212.3[illegible]	$\frac{68}{41}$ × 100 = 3683	5.76
69	HEAT LOSS DUE TO RADIATION* = $\dfrac{\text{TOTAL BTU RADIATION LOSS PER HR}}{\text{LB AS FIRED FUEL} - \text{ITEM 28}}$ ABMA Curve	......	$\frac{69}{41}$ × 100 =	.53
70	UNMEASURED LOSSES **	8.37	$\frac{70}{41}$ × 100 = 3683	.22
71	TOTAL	......	......	38.81
72	EFFICIENCY = (100 − ITEM 71)	......	......	61.19

[1] For rigorous determination of excess air see Appendix 9.2 — PTC 4.1-1964

* If losses are not measured, use ABMA Standard Radiation Loss Chart, Fig. 8, PTC 4.1-1964

** Unmeasured losses listed in PTC 4.1 but not tabulated above may by provided for by assigning a mutually agreed upon value for Item 70.

CARBON LOSS DATA ______ Test No. 1 Date 23/12/85 Cont. ______
Plant of United States Sugar Corporation Location Clewiston, FL
Kind of Fuel Bagasse Mine ______ County Hendry State Florida Size as Fired ______

FUEL DATA

	As Fired	Dry	Comb'le
Moisture %	53.7		
Vol. Matter %	39.63		
Fixed Carbon %	5.72		
Ash %	.95		
Total %	100.00		
Btu. per Lb.	3,683		
Sul. Sep. Det.)			

Weight of Chemical Ash = Lbs. Fuel 1 × % Ash .95 / 100 = .0095 Lbs. (Item A)

Sample Collected From	Wt. Dry Refuse (1)	% Ref. (2)	Lab. Tests % Ash	Lab. Tests % Carb.	Wt. Ash Pounds (5)	Wt. Carb. Pounds (6)	% Carb. Loss.	Remarks
Furnace Ash Pit							†	
							†	
Scrubber	.0267	100	35.48	64.50	.0095	.0172	†	
							†	
							†	
							†	
To Stack By Assumption / By Sample							†	
TOTALS	.0267	100.0			• .0095	.0172	§	

NOTE—Total Wt. Dry Refuse (Col. 1) Must Equal Sum of Ash Wt. and Carb. Wt. (Col. 5 + Col. 6).
• Total Wt. Ash Shown must be same as Chemical ash (Item A.)

Lb. Unburned Carbon in Refuse Per Lb. Fuel = Total Wt. Carbon / Wt. of Fuel Fired = ______ Lb./Lb.

† Carbon Loss Shown = (Wt. Carb × 14600) / (Wt. Fuel × Btu./Lb. Fuel) × 100 = Enter Result in Above Table.

§ Total Carbon Loss Percentage is Sum of Tabulated Amounts Check by Formula:

% Total Carbon Loss = (Lb. Unburned Carbon Per Lb. Fuel × 14600) / (Btu. Per Lb. Fuel) × 100 = 5.29 %

Miscellaneous: ______

By ______ Date ______ Checked ______

BEST AVAILABLE COPY

pg: 62
624
68
PB

LC: A. K Mayo

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613
An Ashland Technology Company

FUELS LABORATORY

TEST REPORT

Laboratory No. 35,592 Sample of Bagasse Date Rec'd 1/2/86

Received From U.S. Sugar Corp. Clewiston, Florida

Sample Data Bagasse Sample 1-85 12/23/85 #4 Blr. Comp. of sample during compliance tests.

Contract No. (641-61018) Field Sample By

Air Drying Loss		%			
Proximate Analysis	**As Rec'd**	**Dry**	**Ultimate Analysis**	**As Rec'd**	**Dry**
Moisture	53.7 %	------	Moisture	%	-------
Volatile	39.63 %	85.59 %	Carbon	%	48.2 %
Ash	0.95 %	2.06 %	Hydrogen	%	6.1 %
Fixed Carbon	5.72 %	12.35 %	Nitrogen	%	0.28 %
	100.0 %	100.0 %	Oxygen (diff)	%	43.34 %
British Thermal Units	3,683	7,955	Sulfur	%	0.02 %
Fusibility of Ash			Ash	%	2.06 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

Date 1/10/86 Tom Gallagher

CALIBRATION DATA

CALIBRATION DATA

November 1, 1985

Meter No. 4
Barometric Pressure 29.95

H	0.1	0.3	0.5	1.0	2.0	4.0	8.0
CFw	2.51	2.51	5.00	4.98	9.97	9.99	10.03
CFd	2.50	2.50	5.00	5.00	10.00	10.00	10.00
Tw	84	85	85	86	86	86	87
Td	85	87	88	89	91	94	96
Time	13.32	7.73	12.31	8.83	12.74	9.01	6.50
Y	1.0056	1.0069	1.0043	.9990	1.0012	1.0038	.9999
Ha	1.619	1.635	1.7387	1.8069	1.8701	1.8532	1.9137

Average H = 1.7767 Average Y = 1.0030

Thermocouple Calibrations

	TC-1	TC-2	ASTM
Ice	32	33	32
Boiling Water	211	214	212
Oil	433	437	434

Barometer Calibration

Aneroid - 29.95 Hg - 29.95

Pitot No. 8

	1	2	3
Std.	.29	.30	.31
Side A	.42	.44	.44
Side B	.43	.44	.44
CPs	.823	.817	.831
Deviation	.001	.007	.007

Average CPs = .824

Nozzle Calibration

Date 12/23/85 5/32A = .211, .210, .210, .210 = .2103

Chain of Custody

CHAIN OF CUSTODY

NAME Kaye Borden
DATE Dec 23, 1985
REPORT NUMBER 8595
REASON FOR CUSTODY: ✓ SAMPLE CLEAN-UP
✓ SAMPLE ANALYSIS - Particulate Only
OTHER
SAMPLE DISPOSITION: ___ DELIVERED TO S.F.E.S. LABORATORY
OTHER

NAME Al. Arlington
DATE 12-23-85
REPORT NUMBER 859-5
REASON FOR CUSTODY: ✓ SAMPLE CLEAN-UP
✓ SAMPLE ANALYSIS
OTHER SO_2, CO + NO_x
SAMPLE DISPOSITION: ___ DELIVERED TO S.F.E.S. LABORATORY
OTHER

NAME
DATE
REPORT NUMBER
REASON FOR CUSTODY: ___ SAMPLE CLEAN-UP
___ SAMPLE ANALYSIS
OTHER
SAMPLE DISPOSITION: ___ DELIVERED TO S.F.E.S. LABORATORY
OTHER

NAME
DATE
REPORT NUMBER
REASON FOR CUSTODY: ___ SAMPLE CLEAN-UP
___ SAMPLE ANALYSIS
OTHER
SAMPLE DISPOSITION: ___ DELIVERED TO S.F.E.S. LABORATORY
OTHER

PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

SOUTH FLORIDA ENVIRONMENTAL SERVICES, INC.

WILLIAM D. ARLINGTON
R. L. CHARTIER
KAYE BARKER

AIR CONSULTING AND ENGINEERING, INC.

STEVE NECK

UNITED STATES SUGAR CORPORATION

PETER BARQUIN
BEN SANFORD
BERT STARRETT

FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

MIRZA P. BAIG

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTH FLORIDA
DISTRICT

2269 BAY STREET
FORT MYERS, FLORIDA 33901-2896

JAN
RECEIVED
Clewiston
Sugar House

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PHILIP R. EDWARDS
DISTRICT MANAGER

January 24, 1986

CERTIFIED MAIL #P166523993
Return Receipt Requested

Mr. A. R. Mayo, Vice President
U. S. Sugar Corp.
Post Office Drawer 1207
Clewiston, Florida 33440

RE: Hendry County - AP
U. S. Sugar Corporation

Dear Mr. Mayo:

An inspection of U. S. Sugar, in Clewiston, by Mirza Baig on January 20, 1986 revealed that your facility is in violation of State Rules and Regulations. The inspection also revealed that many of these violations are recurrent. (Inspection copies are enclosed.)

We would like to meet with you to discuss the violations at the Clewiston facility.

Please contact me within five (5) days to arrange a suitable meeting time.

Sincerely,

Bill Krumbholz

Bill Krumbholz
Environmental Specialist
Enforcement

LANGLEY
ADAIR

Enclosure

BK/ls

Best Available Copy

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Visible Emission Form

Source Name U.S. SUGAR, CLEWISTON Observer MIRZA P. BAIG

Address P.O. DRAWER 1207 CLEWISTON 33440 Date JAN 20, 1986

Point Description BOILER #4 BAGASSE HANDLING SYSTEM. Permit No. AC-26-80930

Time Observation Began 12⁰¹ pm Ended 12¹⁶ pm.

A) Observer Location:
1) Distance from stack (ft.) ≈ 100'
2) Direction from stack SOUTH

B) Meteorological Conditions:
1) Wind Speed (mph) ≈ 10 mph
2) Wind Direction N.W.
3) Sky Condition 5% CLOUD COVER

C) Plume Description:
1) Color BAGASSE DUST
2) Distance Visible (ft) ≈ 100 Ft.
3) Steam Plume (Yes/No) N/A.

D) Summary of Results
1) Average Opacity 33.9%.
2) Readings range from 25% to 50%
3) Opacity exceeded 10% for 15 mins 0 secs.
4) Source ~~was~~/was not in compliance at the time evaluation was made
5) Applicable Regulation: SPECIFIC CONDITION NO: 15 (PSD PERMIT).

E)
1) Process Input Rate UNKNOWN AMOUNT OF BAGASSE WAS BEING BACK-FED FROM BAGASSE STORAGE PILE
2) Operating Parameters 240,000 #/Hour STEAM.

	0	15	30	45		0	15	30	45
0	30	35	30	25	30				
1	35	30	25	30	31				
2	30	35	25	25	32				
3	35	35	40	40	33				
4	25	40	35	30	34				
5	30	35	30	35	35				
6	40	40	30	30	36				
7	35	40	25	30	37				
8	30	30	25	30	38				
9	30	35	40	30	39				
10	30	35	40	30	40				
11	30	25	25	35	41				
12	50	45	50	30	42				
13	35	30	35	45	43				
14	50	50	40	40	44				
15					45				
16					46				
17					47				
18					48				
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20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Observer Signature Mirza P. Baig

Date Certified: September 1985 Expiration Date March 1986

INSPECTION REPORT FORM
AIR POLLUTANT EMISSION SOURCES

FACILITY U.S. SUGAR, CLEWISTON	DISTRICT SOUTH FLORIDA	COUNTY HENDRY
ADDRESS P.O. DRAWER 1207 CLEWISTON, FLA. 33440	CONTACT MR. A.R. MAYO, Vice Pres. MR. BERT STARRETT	
APIS # 52/26/0003/04 — PERMIT # AC-26-80930	EXPIRATION DATE APRIL 11, 1986	

SOURCE DESCRIPTION BOILER # 4.
BAGASSE HANDLING / BACKFEEDING SYSTEM

INSPECTION DATE JAN 20, 1986	AUDIT TYPE II	COMPLIANCE STATUS UNSATISFACTORY

INSPECTION COMMENTS/RECOMMENDATIONS

FOLLOWING BOILER/SCRUBBER DATA WERE OBSERVED:

BOILER # 1 : 150,000 #/HOUR STEAM SCRUBBER ΔP = 4"
BOILER TUBES WERE LEAKING - HAD TO SHUT DOWN ≈ 10 00 AM

BOILER #2 : 175,000 #/HOUR STEAM SCRUBBER ΔP = 7"

BOILER # 3 : 110,000 #/HOUR STEAM SCRUBBER ΔP = 11.5"
PEAK 130,000 #/HOUR FOR ONE HOUR

BOILER # 4 : 240,000 #/HOUR STEAM SCRUBBER ΔP = 7½"; PH = 7.9
PEAK 265,000 #/HR FOR 10 MINUTES

BOILER # 5 : 55,000 #/HOUR STEAM SCRUBBER ΔP = 5"

BOILER # 6 : 60,000 #/HOUR STEAM SCRUBBER ΔP = 5".

NEED A FALSE PLATFORM/WALKWAY NEAR THE SCRUBBER MANOMETERS OF BOILERS # 3, # 5 AND # 6.

COMBINED OPACITY OF ALL BOILERS WAS ≈ 35%.

TV CAMERAS TO MONITOR STACKS WERE FUNCTIONING PROPERLY.

EXCESS BAGASSE HANDLING SYSTEM WAS UN-SATISFACTORY. THIS WAS MENTIONED TO MR. STARRETT LAST SEASON

INSPECTOR(S) NAME(S) MIRZA P. BAIG

SIGNATURE(S) Mirza P. Baig	DATE Jan 21, 1986.

INSPECTION REPORT FORM
AIR POLLUTANT EMISSION SOURCES

FACILITY U.S. SUGAR, CLEWISTON		DISTRICT SOUTH FLORIDA	COUNTY HENDRY
ADDRESS		CONTACT	
APIS # 52/26/0003/04	PERMIT # AC-26-80930	EXPIRATION DATE 4-11-1986	
SOURCE DESCRIPTION BOILER # 4			

INSPECTION DATE	AUDIT TYPE	COMPLIANCE STATUS
JAN 20, 1986		

INSPECTION COMMENTS/RECOMMENDATIONS

AND A YEAR PRIOR TO THAT ALSO.

BAGASSE BACKFEEDING OPERATION WAS IN PROGRESS AT THE TIME OF MY INSPECTION. SALAGE (FEED) WAS BEING PROCESSED. EXCESSIVE EMISSIONS OF BAGASSE DUST WERE BEING EMITTED FROM: FRONT-END LOADER LOADING NEAR THE HOPPER; FUGITIVE BAGASSE DUST GENERATED BY THE LOADER; BAGASSE DRAG/CONVEYOR BELT; TRANSFER POINTS AT THREE DIFFERENT LOCATIONS. DUE TO HIGH WINDS THIS PROBLEM WAS MORE EVIDENT TODAY.

IMMEDIATE ATTENTION IS REQUIRED TO UPGRADE THE EXCESS BAGASSE HANDLING/STORAGE/TRANSFER SYSTEMS. I WAS COVERED WITH BAGASSE DUST WHILE CONDUCTING THE INSPECTION. NEED TO RESOLVE THIS PROBLEM.

INSPECTOR(S) NAME(S) MIRZA P. BAIG

SIGNATURE(S)	DATE
Mirza P. Baig	JAN 21, 1986.

PS Form 3811, July 1983 447-845

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ Show to whom, date and address of delivery.

2. ☐ Restricted Delivery.

3. Article Addressed to:
Mr. A. R. Mayo
U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, FL 33440

4. Type of Service:	Article Number
☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail	P 408 532 064

Always obtain signature of addressee or agent and **DATE DELIVERED.**

5. Signature – Addressee
X [signature]

6. Signature – Agent
X

7. Date of Delivery
12/1/86

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

P 408 532 064

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Mr. A. R. Mayo	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 11/25/86	

PS Form 3800, Feb. 1982

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

November 24, 1986

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
United States Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

A preliminary review of your application for permit to increase the steam production of the No. 4 bagasse/oil fired boiler has been made by the Bureau of Air Quality Management. Before your application can be processed, the Bureau will need the following additional information.

1. Why does this plant need the higher steam production from boiler No. 4? Is it for higher sugar production or will the steam production of the other boilers at this plant be reduced?

2. Please furnish a copy of the compliance tests report which includes the scrubber parameters that existed during the tests for particulate matter, sulfur dioxide, carbon monoxide, VOC, nitorgen oxides, and visible emissions.

3. Please provide a copy of the visible emissions test report for the bagasse handling system. What precautions have been taken to minimize fugitive emissions from this system?

4. BACT for boiler No. 4 limited the sulfur content of the fuel oil to 1.5 percent. To avoid requiring the company to install a separate fuel oil system for the new boiler, the department authorized the use of oil containing up to 2.5 percent (maximum allowed for the other boilers at this plant) provided any oil burned in boiler No. 4 was replaced with oil containing a maximum of 1.5 percent sulfur. If all the sulfur in the 1499 GPH No. 6 oil containing 2.5 percent sulfur is oxidized, it will produce 615 lbs SO_2/hr, not 588 lbs/hr as listed under bagasse/oil burning in Attachment B. Please comment on the above statement.

5. It was noted that two sulfur dioxide emission standards for bagasse were proposed in the application, 0.19 lbs/MMBtu and 0.166 lbs/MMBtu when the bagasse is burned with oil. Please explain why the actual emissions will be different and how you propose to show compliance with both standards.

6. AP-42 lists the NOx emission factor for oil-fired industrial boilers as 55 lbs/1000 gal. Please justify your request for a higher emission factor. If the basis of the request is the nitrogen content of the fuel oil, provide an analysis which shows the nitrogem content of both the low sulfur (1.5%) and high sulfur (2.5%) oils used at this plant.

If we have any question on your ambient air quality impact, our modeler, Max Linn, will contact your engineer, David Buff.

As soon as we receive answers to the above questions, we will resume processing your application. If you have any questions about the information requested, please call Willard Hanks (Review Engineer) or Max Linn (Modeler) at (904)488-1344 or write to me at the letterhead address.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/WH/s

cc: D. Knowles
D. Buff
P. Cunningham

UNITED STATES SUGAR CORPORATION
Post Office Drawer 1207 Clewiston, Florida 33440
Telephone: (813) 983-8121 Telex: 510-952-7753

DER RECEIVED MAIL ROOM
1986 NOV
AM 9:38

October 28, 1986

Mr. C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management
State of Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

DER
NOV 3 1986
BAQM

Re: Clewiston Mill Boiler No. 4
Application for Modification of
Permits No. AC26-80930 and AO26-115292

1031

Dear Mr. Fancy:

Enclosed for filing please find four copies of an application for modification of the referenced Department air permits for Boiler No. 4 at U. S. Sugar Corporation's Clewiston Mill. The purpose of the requested permit modifications is to increase the currently permitted steam production capacity and heat input rate for Boiler No. 4 to better reflect the available operating capacity of the boiler.

As you will recall, the air construction permit for Boiler No. 4 was originally issued January 11, 1985. The construction permit specified that "Steam production shall not exceed an average of 250,000 pounds per hour during any consecutive six hour period; or an instantaneous rate of 275,000 pounds per hour." Also that, "Heat input to Boiler No. 4 from bagasse fuel or a combination of bagasse/oil fuels shall not exceed 545.5 million Btu per hour, six hour average, or an instantaneous rate of 600 million Btu per hour." U. S. Sugar expressed serious concerns about the imposition of these steam production restrictions, especially in view of Boiler No. 4's capability of producing steam with temperature and pressure lower than the steam condition on which the steam capacity limits in the permit were based. Because of the need to move forward with this project, however, U. S. Sugar decided to accept the construction permit for Boiler No. 4, recognizing that modification of the permit could be sought in the future to adjust its steam production provisions.

Following construction of the boiler, compliance with the applicable emission limits was demonstrated through stack testing during the 1985-86 crop season. The Department subsequently issued the air operation permit for Boiler No. 4 with the same steam production limits as were specified in the construction permit.

U. S. Sugar has recently identified the need for additional steam capacity at the Clewiston Mill. It has also become apparent that Boiler No. 4 is capable, under certain favorable bagasse conditions, of producing substantially more steam than the currently permitted production capacity. The requested increase in the permitted capacity will help to meet the Mill's need for additional steam by allowing Boiler No. 4 to achieve its available production capacity. It will also reduce the amount of bagasse surplus produced by the Mill, thereby reducing the potential for emission of fugitive dust from bagasse handling and storage. Finally, it will provide a needed margin of safety to ensure that the permitted steam production rates are not inadvertently exceeded due to the variable combustion characteristics of bagasse and unavoidable fluctuations in Mill operating conditions.

You will note that the enclosed application addresses two different steam conditions for Boiler No. 4: (1) 850 psig, 900° F., and (2) 600 psig, 750° F. The requested steam production limits differ depending upon the steam condition, with a higher steam capacity sought for the lower steam temperature and pressure condition. The heat input rates corresponding to the requested steam production rates are identical, however, due to the lower steam enthalpy associated with the lower pressure and temperature steam condition. It is very important to U. S. Sugar that the modified permits for Boiler No. 4 provide for operation under both of the specified steam conditions, and that the revised steam production rates allow full operating capacity to be utilized when the boiler is producing the lower temperature and pressure steam.

The requested permit modification does not involve a significant increase in the emissions of any regulated pollutant, and thus PSD review is not triggered. We therefore hope that the Department will be able to expeditiously process the enclosed application. We look forward to working with you and your staff in this permit modification effort.

Attached please find a check for the amount of $250.00 to cover the application fee as discussed with your Mr. Bill Thomas on October 23rd where it was agreed that this fee should be based on the applicable potential increase in pollutants involved in this application for modification of the original permit.

Sincerely,

UNITED STATES SUGAR CORPORATION

A. R. Mayo

A. R. Mayo
Senior Vice President
Sugar Houses

ARM:jt
Enclosures

cc: Mr. David Knowles
Mr. David Buff, P.E.
Mr. Peter C. Cunningham, Esq.

AC 26-126965

Oct 186

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

ALEX SENKEVICH
DISTRICT MANAGER

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Bagasse/Oil-Fired Boiler [ ] New[1] [XX] Existing[1]

APPLICATION TYPE: [ ] Construction [ ] Operation [XX] Modification

COMPANY NAME: U.S. Sugar Corporation, Clewiston Mill COUNTY: Hendry

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Boiler No. 4

SOURCE LOCATION: Street W.C. Owens Ave. and Clewiston Street City Clewiston

UTM: East 506.1 North 2956.9

Latitude 26 ° 44' 30"N Longitude 80 ° 56 ' 15"W

APPLICANT NAME AND TITLE: A.R. Mayo, Vice President

APPLICANT ADDRESS: P.O. Drawer 1207, Clewiston, Florida 33440

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of U.S. Sugar Corporation

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: A. R. Mayo

A.R. Mayo, Vice President
Name and Title (Please Type)

Date: 10/14/86 Telephone No. 813-983-8121

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed David A. Buff

David A. Buff
Name (Please Type)

KBN Engineering and Applied Sciences, Inc.
Company Name (Please Type)

P.O. Box 14288, Gainesville, Florida 32604
Mailing Address (Please Type)

Florida Registration No. 19011 Date: 10-6-86 Telephone No. 904/375-8000

DAVID A. BUFF CERTIFICATE NO. 19011 STATE OF FLORIDA REGISTERED ENGINEER

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See Attachment A

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction * Completion of Construction *

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

No new system required: existing scrubber and stack will be utilized

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

AC 26-80930 Issued 1/11/85 Expired 4/11/86

AO 26-115292 Issued 5/19/86 Expires 5/19/91

* No physical construction is required. Boiler, control equipment and other associated equipment are already designed to accommodate the higher steam production rate.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 22.86;

if power plant, hrs/yr_____; if seasonal, describe: Normally November thru March; maximum crop season will be 160 days

F. If this is a new source or major modification, answer the following questions. (Yes or No) Not Applicable - Minor modification (see Attachment A)

1. Is this source in a non-attainment area for a particular pollutant? ______

   a. If yes, has "offset" been applied? ______

   b. If yes, has "Lowest Achievable Emission Rate" been applied? ______

   c. If yes, list non-attainment pollutants. ______

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. ______

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. ______

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? ______

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? ______

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? ______

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Not Applicable

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): see Attachment A
2. Product Weight (lbs/hr): see Attachment A

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

See Attachment A

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Spray Impingement	Particulate	+90%	>0.1 microns	stack test
Scrubber equivalent to Joy	SO_2	>50%	Not applicable	stack test
turbulaire, Type D, Size 200				

E. Fuels

Type (Be Specific)	Consumption* avg/hr	Consumption* max./hr	Maximum Heat Input (MMBTU/hr)
No. 6 fuel oil		1,499 gal/hr	225.0
See Attachment A for Bagasse Consumption			

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: Bagasse (dry basis)/Oil

Percent Sulfur: 0-0.2%/2.5% max Percent Ash: 0.3-3.3/0.1

Density: NA/8.2 lbs/gal Typical Percent Nitrogen: 0.30/0.25

Heat Capacity: 8,000* /18,300 BTU/lb NA/150,000 BTU/gal

*3,600 @ 55% H_2O

Other Fuel Contaminants (which may cause air pollution): ____

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average Not Applicable Maximum ____

G. Indicate liquid or solid wastes generated and method of disposal.

Water from scrubbers used to sluice cane juice mud and then discharged to holding ponds.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 150 ft. Stack Diameter: 8.25 ft.

Gas Flow Rate: * ACFM * DSCFM Gas Exit Temperature: approx. 155 °F.

Water Vapor Content: approx. 28 % Velocity: * FPS

* See Attachment A

SECTION IV: INCINERATOR INFORMATION

Not Applicable

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patholog-ical)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (lbs/hr)							

Description of Waste ______

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ______

Brief description of operating characteristics of control devices: ____________________

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

Not Applicable

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data Not Applicable

1. ______ no. sites ______ TSP ______ ( ) SO^2* ______ Wind spd/dir

Period of Monitoring ___/___/___ to ___/___/___
month day year month day year

Other data recorded ______

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)________________________

3. Upper air (mixing height) data obtained from (location)________________________

4. Stability wind rose (STAR) data obtained from (location)________________________

C. Computer Models Used

1. ________________________ Modified? If yes, attach description.

2. ________________________ Modified? If yes, attach description.

3. ________________________ Modified? If yes, attach description.

4. ________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	________________	grams/sec
SO^2	________________	grams/sec

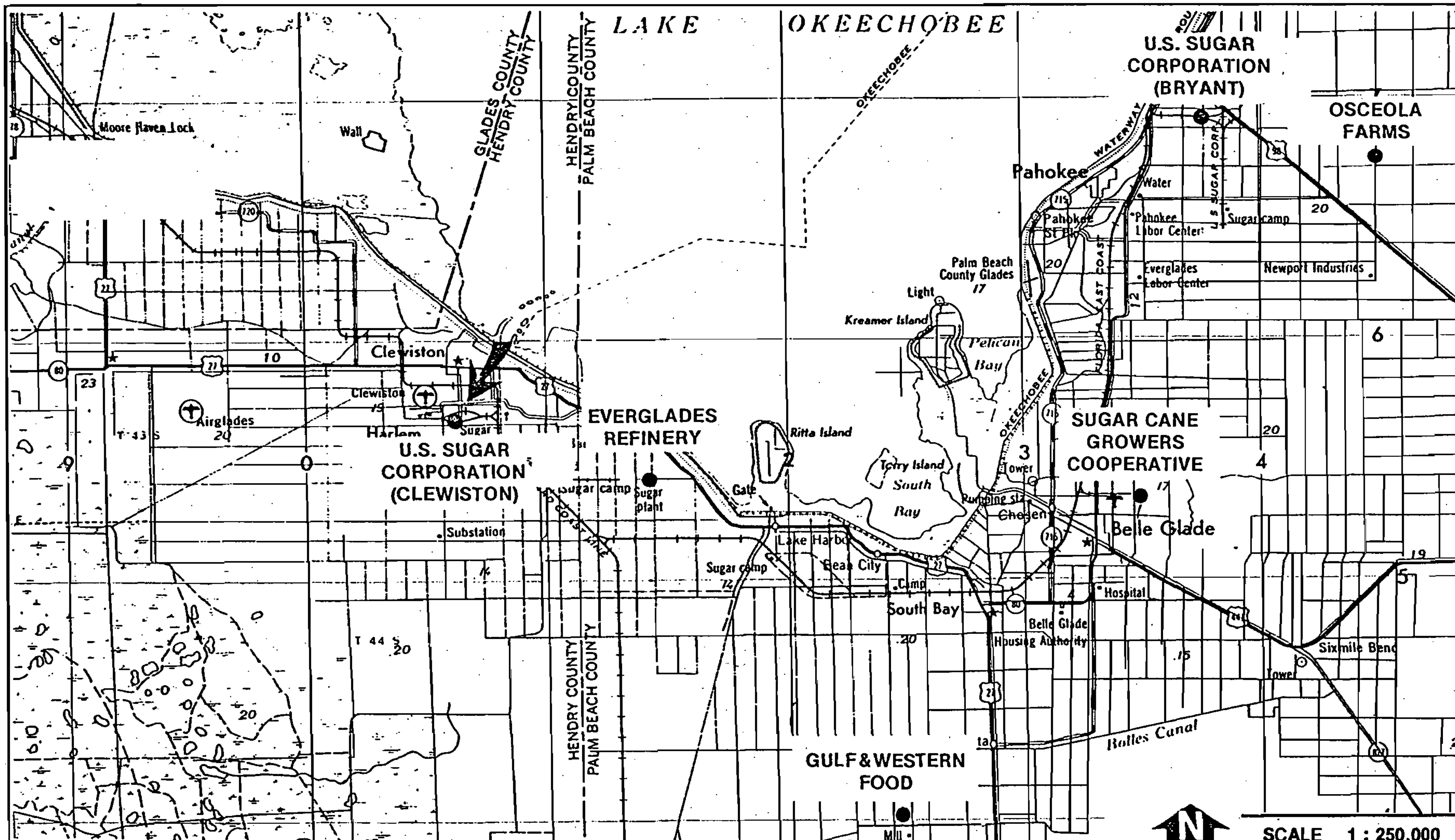
E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

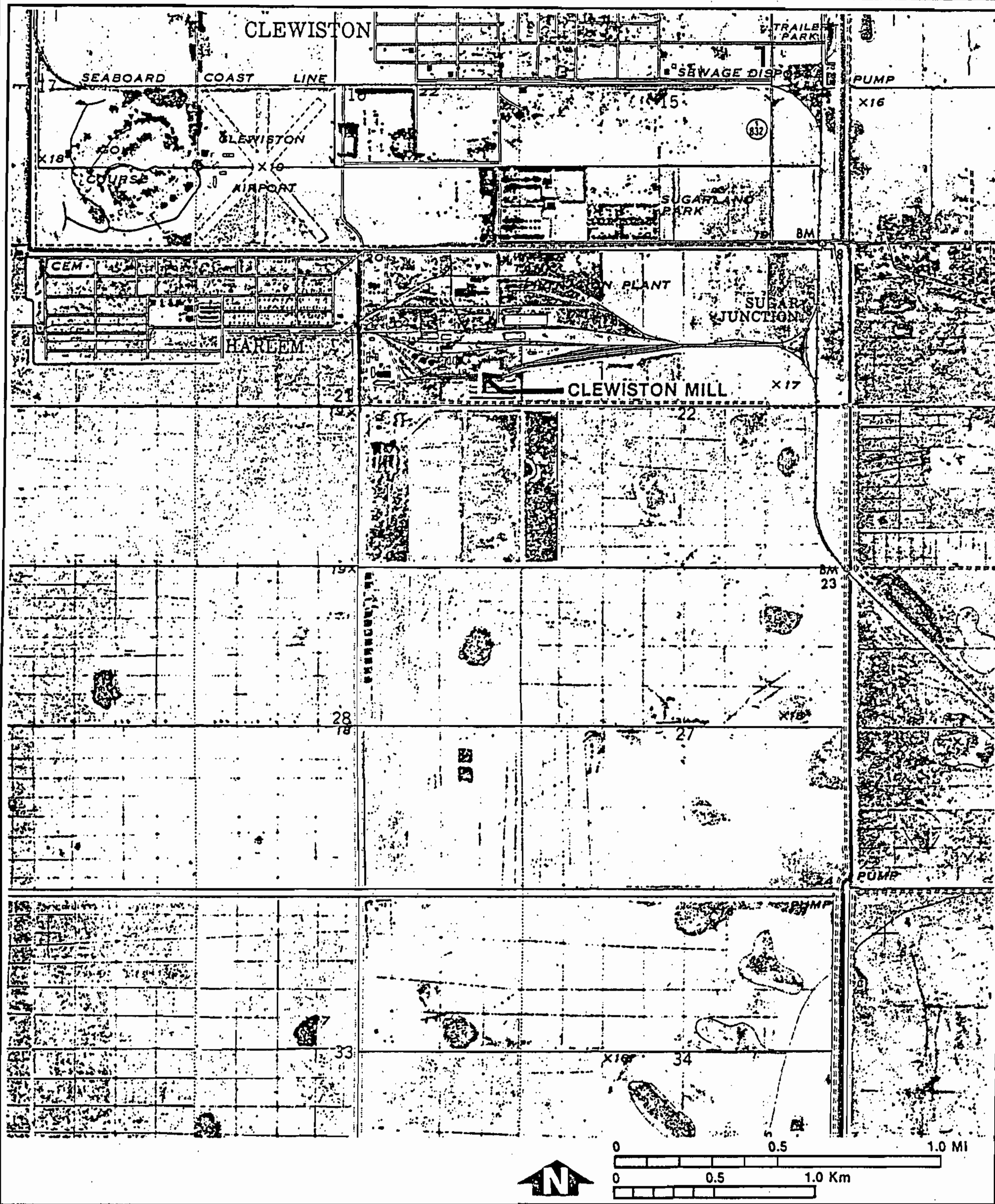


LOCATION OF U.S. SUGAR CORPORATION WITH RESPECT TO SURROUNDING AREA

SOURCE: ESE, 1983.

U.S. SUGAR CORPORATION
Clewiston, Florida

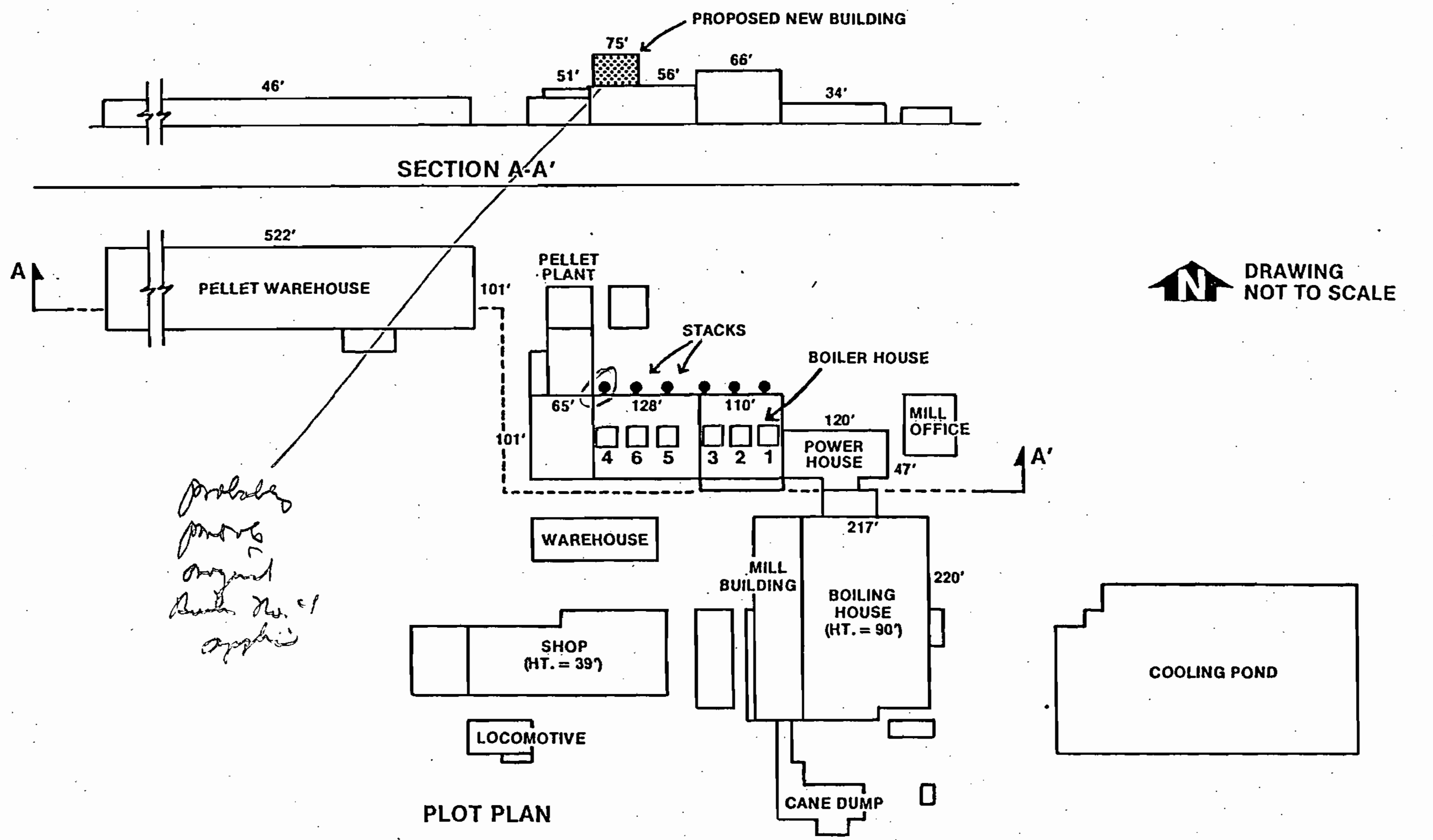
BEST AVAILABLE COPY



VICINITY MAP OF U.S. SUGAR CORPORATION'S CLEWISTON MILL

SOURCE: USGS, 1970.

U.S. SUGAR CORPORATION
Clewiston, Florida

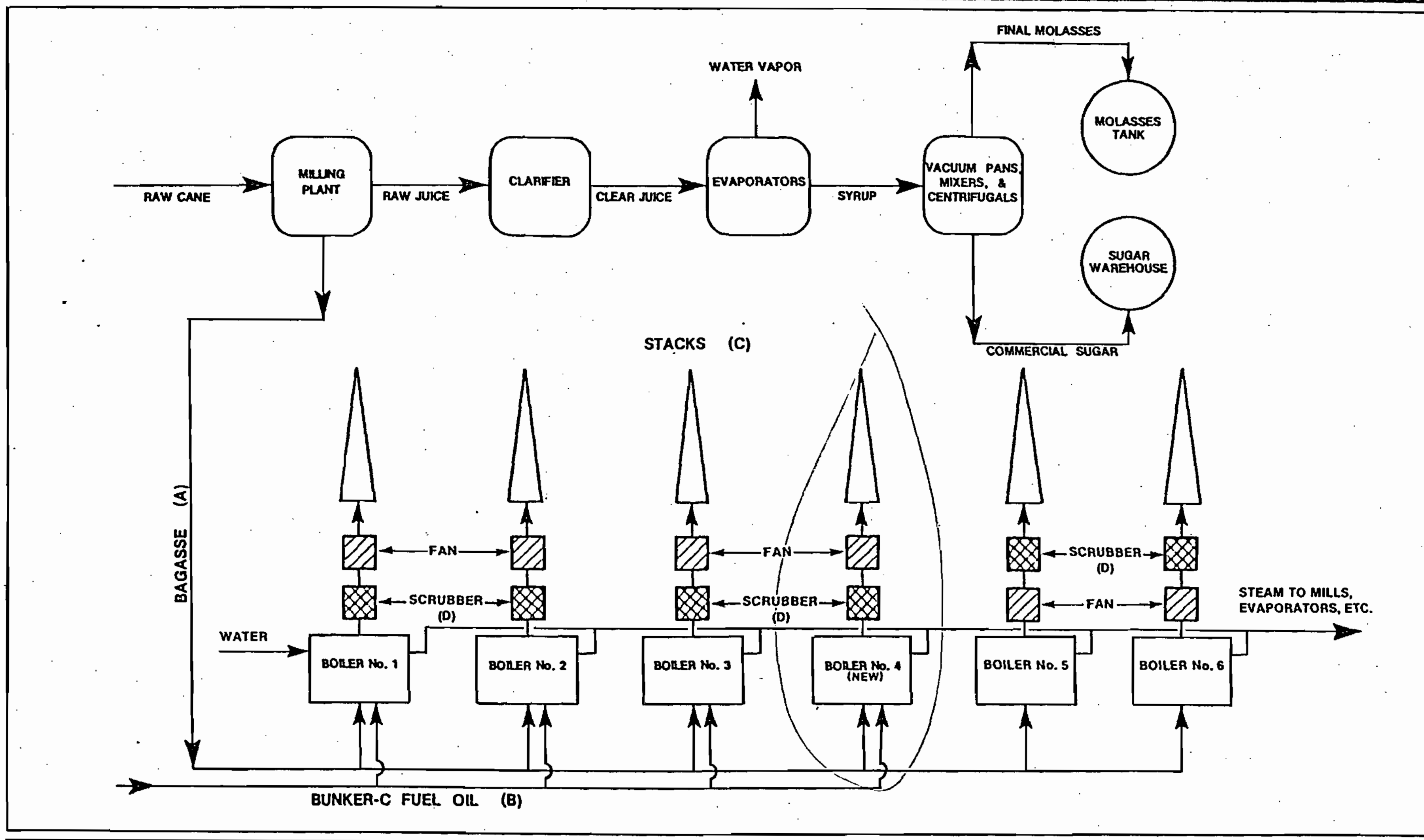


PLOT PLAN FOR CLEWISTON MILL

SOURCE: ESE, 1983.

U.S. SUGAR CORPORATION

Clewiston, Florida



SCHEMATIC PROCESS FLOW DIAGRAM

SOURCE: ESE, 1983.

U.S. SUGAR CORPORATION
Clewiston, Florida

ATTACHMENT A

PROJECT DESCRIPTION AND SOURCE APPLICABILITY

A.1 PROJECT DESCRIPTION

The operation of Boiler No. 4 at U.S. Sugar Corporation's Clewiston mill has indicated that it is capable, under certain favorable bagasse conditions, of producing substantially more steam than the currently permitted production capacity. Therefore, U.S. Sugar is proposing to increase the permitted capacity of this boiler. Boiler No. 4 is a dual pressure boiler that can operate at two different steam conditions: 850 psig, 900°F, the permitted condition; and 600 psig, 750°F, the current operating condition. As a result, the modification also calls for expressing of the permitted steam production in terms of the current operating pressure and steam temperature.

The current permitted steam rates and conditions for the boiler, and the proposed steam rates at these conditions, are shown in Table A-1. Associated with the steam production rate increase will be an increase in the permitted heat input rate and maximum bagasse fuel burning rate. These increased rates are also shown in Table A-1. No increase in the permitted fuel oil burning rate for Boiler No. 4 is being requested.

No physical changes will be made to Boiler No. 4 to accommodate the steam rate increase. The existing equipment, including wet scrubber, are already capable of accommodating the increased production rates.

The current operating permit for Boiler No. 4 limits operation to 182 days per year. As part of the proposed increase in steam production rate, future operation will be limited to 160 days per year.

A.2 EMISSIONS AND SOURCE APPLICABILITY

The increased maximum heat input and bagasse burning rates associated with the increase in steam production rate will result in an increase in air emissions from Boiler No. 4. Emission calculations for the proposed modification are presented in Attachment B. These estimates are in general

Table A-1. Current Permitted and Proposed Operating Rates and Conditions, U.S. Sugar Boiler No. 4

Boiler Operating Condition	Pressure (psig)	Temperature (°F)	Averaging Time	Steam Rate (lb/hr)		Heat Input Rate (10^6 Btu/hr)		Maximum Bagasse Burning Rate (lb/hr wet)#	
				Current*	Proposed	Current*	Proposed	Current*	Proposed
1	850	900	Maximum	275,000	346,231	600.0	777.20	166,667	215,889
1	850	900	6-hour	250,000	314,757	545.5	706.55	151,528	196,264
2	600	750	Maximum	(292,600)**	368,500	600.0	777.20	166,667	215,889
2	600	750	6-hour	(266,000)**	335,000	545.5	706.55	151,528	196,264

* Based upon operating permit AO-26-115292
\# Wet bagasse assumed to contain 55% moisture (3600 Btu/lb wet)
** The steam production rate for Boiler operating Condition 2, equivalent to that of Boiler operating Condition 1 (i.e., same maximum heat input rate).

psia	900°F
850	1453.6 Btu/lb
864.7	(?)
875	1452.7 Btu/lb

psia	740	750*	760
610	1362.1	(1367.8)	1373.5
614.7			
620	1373.0	(1378.7)	1384.2

* calc

$$\left(\frac{4.7}{10}\right)\left[1367.8 - 1378.7)\right] = 5.1$$

ΔH @ 600 psig + 750°F = 1367.8 + 5.1 = 1372.9 Btu/lb

ΔH @ 600 psig + 750°F ≈ 1378 BTU/lb

based upon the allowable emission rates contained in the Prevention of Significant Deterioration (PSD) construction permit for Boiler No. 4, or the emission factors presented in the construction permit application for Boiler No. 4. In the case of sulfur dioxide emissions from bagasse burning, U.S. Sugar is proposing a more stringent limit than is contained in the present permit for Boiler No. 4, such that there will be no increase above current permitted SO_2 emission rates.

Presented in Table A-2 is a summary of regulated pollutant emissions from Boiler No. 4 both before and after the increase in steam production. The current permitted or maximum emission rates were obtained from the construction permit or the construction permit application for Boiler No.4. Three averaging times are addressed in Table A-2: 1-hour, 6-hour, and annual.

The proposed future maximum emissions reflect the worst case fuel (i.e., bagasse only burning for PM, CO and VOC, or bagasse/fuel oil combination burning for SO_2 and NO_x). Emissions of trace elements are not shown in Table A-2 because such emissions were due solely to fuel oil burning, and no increase in the fuel oil burning rate for Boiler No. 4 is being requested.

The PSD permit and current operating permit limit SO_2 emissions from bagasse burning to 0.25 lb/10^6 Btu heat input and limit total SO_2 emissions from bagasse/oil burning to 680.0 lb/hr. Normal operation of Boiler No. 4 is 100% bagasse burning. At the current permitted level of 0.25 lb/10^6 Btu due to bagasse burning, current maximum SO_2 emissions from burning 100% bagasse are 150.0 lb/hr for an instantaneous peak and 136.4 lb/hr for a six-hour average. In order to not increase these maximum SO_2 emission rates at the increased steam production rates, U.S. Sugar will limit SO_2 emissions from Boiler No. 4 to 0.19 lb/10^6 Btu when burning bagasse. This SO_2 emission level is equivalent to a 62% removal efficiency (uncontrolled emissions are 0.5 lb/10^6 Btu). SO_2 testing performed on Boiler No. 4 has demonstrated that the 0.19 lb/10^6 Btu level can be achieved on a continuous basis without changing operation of the boiler system or wet scrubbing system.

? SO_2 from bagasse

Table A-2. Current Permitted, Proposed and Net Increase in Emissions, U.S. Sugar Boiler No. 4

Pollutant	Current Permitted Emissions*			Proposed Future Emissions			Net Emissions Increase			PSD Significant Emission Rate (TPY)
	Maximum (lb/hr)	6-Hr.Avg. (lb/hr)	Annual (TPY)	Maximum (lb/hr)	6-Hr.Avg. (lb/hr)	Annual (TPY)	Maximum (lb/hr)	6-Hr.Avg. (lb/hr	Annual (TPY)	
Particulate Matter	90.0	81.83	178.72	116.58	105.98	203.48	26.58	24.15	24.76	25
Sulfur Dioxide	680.0	680.0	382.3	680.0	680.0	348.7	0	0	-33.6	40
Nitrogen Oxides	136.8	136.8	206.0	192.4	180.7	236.60	55.6	43.9	30.6	40
Carbon Monoxide	150.0	136.4	297.9	194.3	176.6	339.1	44.3	40.2	41.2	100
Vol. Org. Compounds	141.7	128.8	281.3	183.5	166.8	320.3	41.8	38.0	39.0	40

Note: Worst case emissions for PM, CO and VOC occur when burning 100% bagasse; worst case emissions for SO_2 and NO_x occur when burning the maximum allowable fuel oil with the remainder of heat input due to bagasse.
TPY = Tons Per Year
* When specific permit limits were not set, figures reflect maximum emission rate contained in PSD permit application.

During infrequent periods when fuel oil is burned in Boiler No. 4, maximum SO_2 emissions are limited to 680.0 lb/hr. U.S. Sugar is proposing no increase in SO_2 emissions during such periods. Under conditions of highest SO_2 emissions from fuel oil burning (i.e., 225 x 10^6 Btu/hr heat input due to oil and 2.5% sulfur content), SO_2 emissions due to bagasse burning would be limited to 0.166 lb/10^6 Btu on an instantaneous basis and 0.19 lb/10^6 on a six-hour average.

Based upon the six-hour averaging time conditions and proposed SO_2 emission rates described above, total annual SO_2 emissions are calculated at 348.7 TPY. This is less than the current permitted annual SO_2 emissions of 382.3 TPY.

Shown in Table A-2 is the net increase in permitted emission rates proposed for Boiler No. 4, and the PSD significant emission rates. As shown, all net increases are below the respective PSD significant emission rate. As a result, the proposed modification is not subject to PSD review. For sulfur dioxide, the stricter emission limit discussed previously for bagasse burning will result in no net increase in short-term SO_2 emissions, and a decrease in annual SO_2 emissions.

For other pollutants, the net increases are small and are below the PSD significant emission rates.

A.3 STACK PARAMETERS

The existing stack serving Boiler No. 4 will continue to be utilized. In addition, no change in the exhaust gas temperature is expected. However, due to the increased bagasse burning, an increase in the maximum exhaust gas flow rates are expected. On the basis of the recent compliance test for Boiler No. 4 (12/23/85), maximum hourly and 6-hour average exhaust gas flows representative of the proposed maximum steam production rates were estimated, and are shown in Table A-3.

Table A-3. Estimated Boiler No. 4 Exhaust Gas Flow Rates at the Proposed Maximum Steam Production Rates

Condition	Bagasse Burning Rate (lb/hr wet)	Estimated Gas Flow Rate * (acfm)	Estimated Gas Flow Rate * (dscfm)	Estimated Exit Velocity+ (ft/s)
Stack test 12/23/85*	149,920	186,548	120,944	58.2
Condition 1 or 2, maximum	215,889	268,634	174,163	83.8
Condition 1 or 2, 6-hr average	196,264	244,215	158,331	76.1

* Data are average of three tests
\+ When burning 100% bagasse; stack diameter is 8.25 ft.

A.4 AIR QUALITY IMPACT ANALYSIS

A.4.1 Particulate Matter

The construction permit application for Boiler No. 4 presented a detailed air quality impact analysis for particulate matter (PM). This analysis considered all boilers at the Clewiston mill including a background PM concentration. Boiler No. 4 was modeled at a PM emission rate of 0.2 $lb/10^6$ Btu, equivalent to 109.1 lb/hr and 238.3 tons per year (TPY). Total PM impacts, including background, were predicted to be 149 ug/m^3 for the 24-hour averaging time, and 51.9 ug/m^3 for the annual averaging time. The maximum predicted impacts of Boiler No. 4 were 8 ug/m^3, 24-hour average, and 0.4 ug/m^3, annual average. The small proposed increase of 24.76 TPY associated with the proposed steam rate increase from Boiler No. 4 will not significantly increase the predicted annual average impacts (i.e., less than a 0.1 ug/m^3 increase based upon the previous analysis). Total annual average impacts will remain well below the ambient air quality standard (AAQS) of 60 ug/m^3.

In the case of the 24-hour averaging time, the proposed future Boiler No. 4 PM emission rate, based upon 0.15 $lb/10^6$ Btu, is 105.98 lb/hr (maximum 6-hour average). Since this emission rate is lower than the previously modeled emission of 109.1 lb/hr, predicted maximum 24-hour PM concentrations would also be lower than the previously predicted 149 ug/m^3 (the AAQS is 150 ug/m^3). In addition, the 105.98 lb/hr PM will be emitted with a greater exhaust gas flow (approximately 244,215 acfm) compared to the previously modeled situation (205,180 acfm). This increase in exhaust gas flow will act to further reduce PM impacts below those previously predicted, by increasing the effective plume rise of the emissions.

Based upon these considerations, the impact of the increased Boiler No. 4 PM emissions are predicted to comply with all PM AAQS.

A.4.2 Sulfur Dioxide

Since maximum sulfur dioxide (SO_2) emissions (both short-term and annual), will not increase as a result of the proposed modification, no increase in SO_2 impacts are predicted to occur. As discussed in regard to PM emissions, previously predicted SO_2 short-term impacts will actually decrease due to the higher exhaust gas flow rate associated with the modification. The net decrease in permitted annual SO_2 emissions due to the proposed modification will result in decreased annual average SO_2 impacts.

A.4.3 Nitrogen Dioxide

Only an annual average AAQS exists for nitrogen dioxide (NO_2). The previously predicted maximum NO_2 impact due to Boiler No. 4 was 0.5 ug/m^3. This level was below the significant impact level of 1 ug/m^3. The maximum annual NO_x emissions from Boiler No. 4 will increase by only 30.6 TPY as a result of the proposed modification. This is an increase of only 15 percent, and therefore maximum future NO_2 impacts due to Boiler No. 4 are predicted to remain below the significance level 1 ug/m^3.

A.4.4 Carbon Monoxide

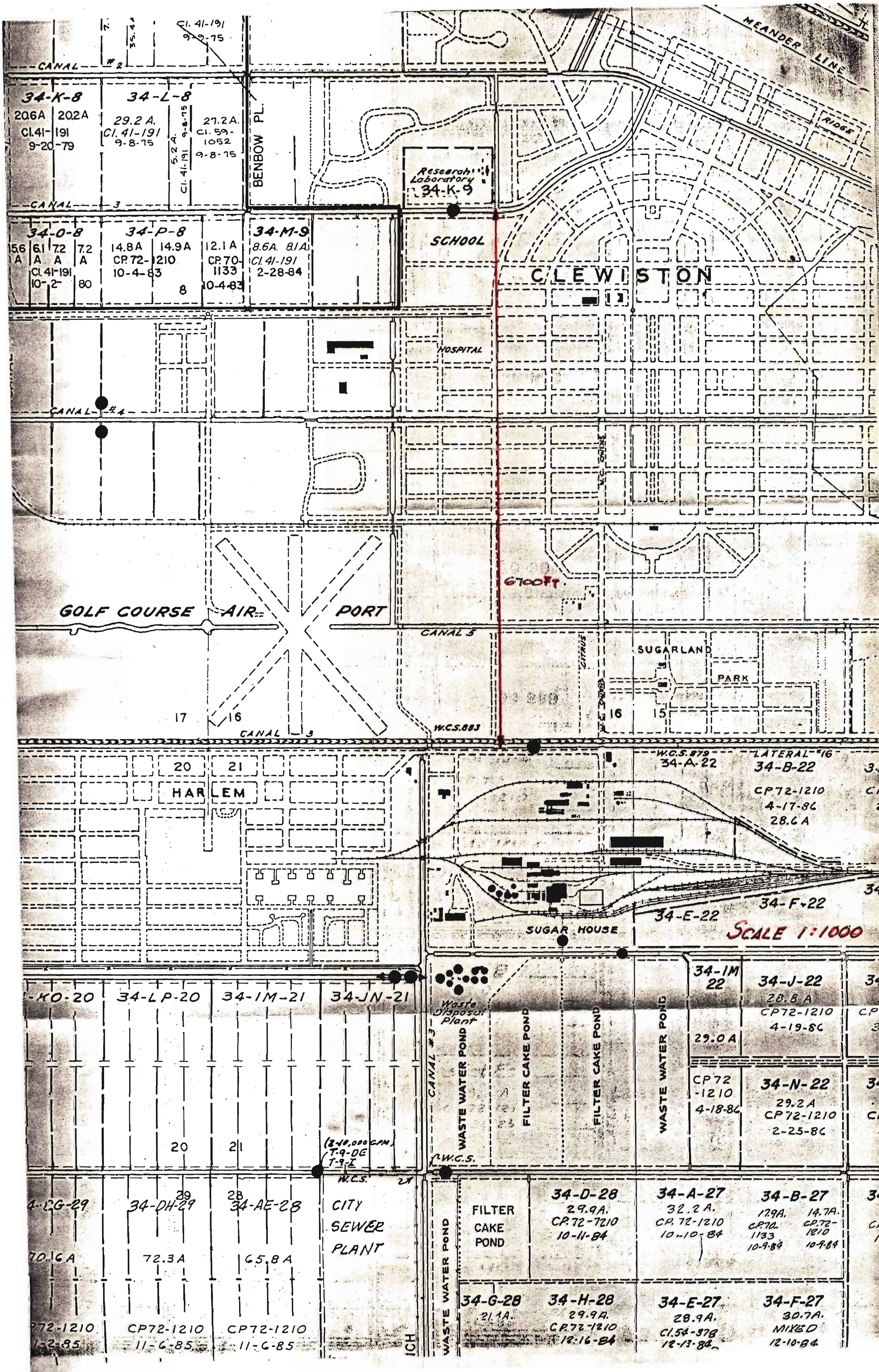
Previously predicted maximum carbon monoxide (CO) impacts due to Boiler No. 4 were more than 25 times less than the 1-hour and 8-hour significance levels of 2000 ug/m^3 and 500 ug/m^3, respectively. The proposed modification will result in an increase of 30 percent in maximum CO emissions from Boiler No. 4. Therefore, maximum CO impacts with Boiler No. 4 operating at the proposed steam rates should remain well below the significance levels.

A.4.5 PSD Increment Consumption

As discussed in Section A.4.1 and A.4.2, maximum emissions of SO_2 (short-term and annual average) and PM (short-term only) considered in the previous modeling analysis will not increase as a result of the proposed modification. A slight increase in annual PM emissions over the level previously modeled will be associated with the modified Boiler No. 4 operation.

The construction permit application for Boiler No. 4 discussed the effect of Boiler No. 4 operation upon PSD allowable increments (increments have been established for PM and SO_2 only). It was stated that the relatively small increment consuming impacts of Boiler No. 4, the increment expansion provided by the East and West pellet plant shutdowns, and the high baseline emissions for Boiler Nos. 5 and 6 (no scrubbers installed), and the lack of other increment consuming emissions in the vicinity of the Clewiston mill, demonstrated that Boiler No. 4 would not cause or contribute to a violation of any PSD Class II allowable increment.

The previous maximum annual average PM impact of Boiler No. 4 of 0.4 ug/m^3, based upon 0.2 lb/10^6 Btu and 238.3 TPY, represents only 2 percent of the allowable PSD Class II increment for PM of 19 ug/m^3, annual average. The proposed small increase in annual average PM emissions (24.76 TPY) does not alter the previous conclusions. The operation of Boiler No. 4 at the proposed steam rates, therefore, is predicted to result in compliance with all Class II allowable PSD increments.



CANAL #2
Cl. 41-191
9-9-75
MEANDER LINE
RIDGE
34-K-8
20.6A
20.2A
Cl. 41-191
9-20-79
34-L-8
29.2 A.
Cl. 41-191
9-8-75
5.2 A.
Cl. 41-191
9-8-75
27.2 A.
Cl. 59-1052
9-8-75
BENBOW PL.
Research Laboratory
34-K-9
CANAL 3
34-O-8
15.6 A
6.1 A
7.2 A
7.2 A
Cl. 41-191
10-2-80
34-P-8
14.8A
14.9A
CP. 72-1210
10-4-83
8
12.1 A
CP. 70-1133
10-4-83
34-M-9
8.6A.
8.1A.
Cl. 41-191
2-28-84
SCHOOL
CLEWISTON
HOSPITAL
CANAL #4
W.C. OWENS
6700 FT.
GOLF COURSE
AIR PORT
CANAL 5
CITRUS
SUGARLAND
PARK
W.C. OWENS
16
15
17
16
CANAL 3
W.C.S. 883
W.C.S. 879
LATERAL 16
34-A-22
34-B-22
CP 72-1210
4-17-86
28.6 A
20
21
HARLEM
34-F-22
34-E-22
SUGAR HOUSE
SCALE 1:1000
34-IM 22
34-J-22
28.8 A
CP 72-1210
4-19-86
KO-20
34-LP-20
34-IM-21
34-JN-21
Waste Disposal Plant
CANAL #3
WASTE WATER POND
FILTER CAKE POND
FILTER CAKE POND
WASTE WATER POND
29.0 A
CP 72-1210
4-18-86
34-N-22
29.2 A
CP 72-1210
2-25-86
20
21
(240,000 GPM)
T-9-DE
T-9-E
W.C.S.
W.C.S. 29
29
28
CG-29
34-DH-29
34-AE-28
CITY SEWER PLANT
FILTER CAKE POND
34-D-28
29.9A.
CP. 72-1210
10-11-84
34-A-27
32.2 A.
CP. 72-1210
10-10-84
34-B-27
17.9A.
CP. 70-1133
10-9-84
14.7A.
CP. 72-1210
10-9-84
70.16 A
72.3 A
65.8 A
WASTE WATER POND
34-G-28
21.1A.
34-H-28
29.9A.
CP. 72-1210
12-16-84
34-E-27
28.9A.
Cl. 54-378
12-13-84
34-F-27
30.7A.
MIXED
12-10-84
72-1210
1-2-85
CP72-1210
11-6-85
CP72-1210
11-6-85

ATTACHMENT B

Boiler No. 4 Emission Calculations

Correct

A. Boiler Operating Data

1. Steam Enthalpies

Boiler feedwater @ 250°F = 218.59 Btu/lb

Steam condition 1: 850 psig, 900°F = 1453.2 Btu/lb

Steam condition 2: 600 psig, 750°F = 1378.6 Btu/lb H: ~1373

Check — IF wrong, could ~~feed max~~ prod. more steam

2. Heat input calculations

Based upon boiler efficiency of 55% when firing bagasse

Steam production rates:

(1453.2 - 218.59)/0.55

Condition 1, 6-hr average = 6hr 314,757 lb/hr (@ 850 psig, 900°F) 706.55 MMBtu/hr

Condition 1, maximum = max 346,231 lb/hr (@ 850 psig, 900°F) 777.20 MM Btu/hr

Condition 2, 6-hr average = 6hr 335,000 lb/hr (@ 600 psig, 750°F) 706.55

Condition 2, maximum = max 368,500 lb/hr (@ 600 psig, 750°F) 777.2

↑ (1378.6 - 218.59)/.55

Condition 1, 6-hr average (@ 850 psig, 900°F):

Heat gain by steam = 1453.2 - 218.59 = 1234.61 Btu/lb

Heat input to boiler = 314,757 lb/hr x 1234.61 / 0.55 =
706.55 x 10^6 Btu/hr

Condition 1, maximum (@ 850 psig, 900°F):

Heat gain by steam = 1234.61 Btu/lb

Heat input to boiler = 346,231 lb/hr x 1234.61 / 0.55 =
777.2 x 10^6 Btu/hr

Condition 2, 6-hr average (@ 600 psig, 750°F):

Heat gain by steam = 1378.6 - 218.59 = 1160.0 Btu/lb

Heat input to boiler = 335,000 lb/hr x 1160.0 / 0.55 =
706.55 x 10^6 Btu/hr

Condition 2, maximum (@ 600 psig, 750°F):

Heat gain by steam = 1160.0 Btu/lb

Heat input to boiler = 368,500 lb/hr steam x 1160.0 / 0.55
777.2 x 10^6 Btu/hr

3. Maximum steam production from oil firing (approximately 1500 gal/hr oil equivalent to approximately 150,000 lb/hr steam)

Based upon 80% boiler efficiency when firing oil

Maximum heat input due to oil = 225 x 10^6 Btu/hr

225×10^6 BTU/hr   1234.61 BTU / lb steam   0.8 BTU out / BTU in

850 psig

Condition 1: 225 x 10^6 Btu/hr / 1234.61 Btu/hr x 0.80
= 145,795 lb/hr steam (@ 850 psig, 900°F)

Condition 2: 225 x 10^6 Btu/hr / 1160.0 Btu/lb x 0.80
= 155,172 lb/hr steam (@ 600 psig, 750°F)

B. Emission Calculations

Based upon Boiler No. 4 PSD application, maximum emissions of PM, CO and VOC occur when burning 100% bagasse. Maximum emissions of SO_2 and NO_x occur when burning the maximum amount of fuel oil, with the remainder of heat input due to bagasse burning. Since emissions are based upon either heat input or amount of fuel burned, maximum emission rates are the same for both steam operating conditions. Boiler operation will be limited to 160 days per year.

1. Particulate Matter

Emission limit = 0.150 lb/10^6 Btu

Maximum : 777.2 x 10^6 Btu/hr x 0.150 lb/10^6 Btu = 116.58 lb/hr

6-hr avg. : 706.55 x 10^6 Btu/hr x 0.150 lb/10^6 Btu = 105.98 lb/hr

Annual : 105.98 lb/hr x 24 hr/day x 160 day/yr / 2000 lb/ton
= 203.48 64 tons/yr

2. Sulfur Dioxide

The sulfur dioxide emission tests conducted on Boiler No. 4 demonstrate a high degree of removal within the boiler/scrubber system when burning bagasse. A removal efficiency of 50% was assumed in the PSD application, with an associated emission level of 0.25 lb/10^6 Btu. Based upon the test results, U.S. Sugar Corporation is willing to limit itself to no increase in emissions over the current permitted level.

AC 26 - 80930 1/11/86

SC 1 Steam prod 250,000 lb/hr, 6 hr avg
275,000 " , Instantaneous

SC 2 Heat No 6 oil - 225×10^6 Btu/hr
(1500 GPH + 150,000 lb/hr)

SC 3 Avg 12 mo, max oil burn limited 500,000 gal in No 4 boiler

SC 4 24 hr 40,800 all fuel equip

SC 5 3 hr 6,300 "

SC 7 Max heat in (oil + bagasse) 545.5 mm Btu/hr (6 hr avg)
600 " (MAX)

SC 10 PM std 0.150 lb/mm Btu bagasse
0.10 " oil
prorate std

SC 11 20% / 40% 2 min VE STD

SC 12 1.50% S makeup oil

SC 13 SO_2 STD 0.25 lb/mm Btu on bagasse (100%)
SO_2 when burning oil — 680 lb/hr max

SC 14 CO - 0.25 lb/mm Btu VOC - 1.7 lb/T wet bagasse
SC 15 bagasse handling system - 10% opacity
SC 16 NO_2 - 136.8 lb/hr

SO2 ↓

a. Bagasse burning

1. Current permitted levels

$0.25\ lb/10^6\ Btu$

Instantaneous - 600×10^6 Btu/hr x $0.25\ lb/10^6$ Btu

= 150.0 lb/hr Current allowable

6-hour average - 545.4×10^6 Btu/hr x $0.25\ lb/10^6$ Btu

= 136.4 lb/hr Current allowable

2. Proposed levels

Instantaneous - 150 lb/hr / 777.2×10^6 Btu/hr

= $0.19\ lb/10^6$ Btu

6-hour average - 136.4 lb/hr / 706.55×10^6 Btu/hr

= $0.19\ lb/10^6$ Btu

Proposed emission level = $0.19\ lb/10^6$ Btu ← SC

Uncontrolled emissions = $0.5\ lb/10^6$ Btu ?

SO_2 removal efficiency = (0.5 - 0.19) / 0.5 x 100

= 62%

recheck calc

b. Bagasse/oil burning

Current SO_2 emissions are limited to 680.0 lb/hr. This current level will not be exceeded in the future. SO_2 emissions due to fuel oil burning at 225×10^6 Btu/hr heat input and assuming all sulfur in fuel oil emitted as SO_2 (from Boiler No. 4 permit application) = 588.4 lb/hr.

Remainder of SO_2 due to bagasse burning = 680.0 - 588.4

= 91.6 lb/hr

680 - 615 = 65 lb/hr

? Calc shows 615 lb/hr (369 lb/hr @ 1.5% S)

This is correct

1. Proposed instantaneous maximum heat input rate

= 777.2×10^6 Btu/hr

Heat input due to bagasse at maximum oil firing rate

= 777.2 - 225.0 = 552.2×10^6 Btu/hr

Revised SO_2 emission rate due to bagasse burning (during maximum oil-firing conditions)

= 91.6 lb/hr / 552.2×10^6 Btu/hr

= $0.166\ lb/10^6$ Btu

65/552×10⁶ = 0.12 lb/mmBtu (how check)

SO_2 Removal efficiency (for maximum oil-firing conditions): = (0.50 - 0.166) / 0.5 x 100 = 66.8%

.5 - .12/.5 × 10² = 76%

615/1.5 / 2.5 = 369 #/hr

Diff from calc = 615 lb SO2/hr

225×10⁶ Btu/hr / 150,000 Btu/gal × 8.2 lb/gal × .025×2 # SO2/# S ≈ 615 lb SO2/hr

1499 gal/hr × 8.2 lb/gal × .025 # S/# oil × 2 # SO2/# S

IK

Recheck calculation

AP42 calc to 588 lb/hr emission SO2 with 2.5% S wt

2. Proposed 6-hour average heat input rate

$= 706.55 \times 10^6$ Btu/hr

Heat input due to bagasse at maximum oil firing rate

$= 706.55 - 225.0 = 481.55 \times 10^6$ Btu/hr

Revised SO_2 emission rate due to bagasse burning (during maximum oil firing conditions)

$= \cancel{91.6}$ 65 $/ 481.55 = 0.19$ lb/10^6 Btu   0.135 lb/mmBtu

SO_2 Removal efficiency $= (0.5 - 0.19)/0.5 \times 100 = 62\%$ .135   74.0%

c. Annual SO_2 emissions

Current maximum annual SO_2 emmissions, based upon PSD permit application, are 382.3 TPY.

Proposed annual emissions are calculated as follows:

SO_2 emissions due to Fuel oil burning @ 500,000 gal/yr

$= \cancel{98.0}$ 62 TPY SO_2 (see Boiler No. 4 permit application).

Fuel oil burning limited to equivalent of 333.6 hr/yr at maximum fuel oil burning rate (see Boiler No. 4 permit application).

500,000 GPY / 1499 GPH = 333.6 hr/yr

During these hours, heat input due to bagasse

$= 706.55 - 225.0 = 481.55 \times 10^6$ Btu/hr (based upon 6-hour averaging time for annual calculations).

Remainder of hours, operate at maximum bagasse input:

706.55×10^6 Btu/hr

Hours per year on all bagassee $= (160 \times 24) - 333.6$

$= 3506.4$ hr/yr

SO_2 emissions due to bagasse firing (at proposed limits):

333.6 hr/yr @ 481.55×10^6 Btu/hr and $\boxed{0.19}$ lb $SO_2/10^6$ Btu

$= \boxed{15.3}$ TPY   With oil

3506.4 hr/yr @ 706.55×10^6 Btu/hr and $\boxed{0.19}$ lb $SO_2/10^6$ Btu

$= 235.4$ TPY

Total SO_2 (bagasse/oil) $= 15.3 + 235.4 + \cancel{98.0} = 348.7$ TPY
62 = 312.7 TPY

61.5 TPY @ 1.5% S

102.5 TPY @ 2.5% S

" T/2000 lb

.015 x 2 # SO_2 / lb

8.2 lb / gal

500,000 gal / yr

NOT really. Allowed 2.5% because single tank, req'd. 1.5%

1.5% S in Oil is BACT

I/C – BACT - 1.5% because single fuel tank, allowed up 2.5% as used in other equip. Replace 1.5% BACT. Will not relax comment? With restriction, SO_2 emissions lower than calc. values.

~~With~~

3. Nitrogen Oxide

The following information, taken from the PSD application, is still valid:

Maximum heat input due to fuel oil burning = 225 x 10^6 Btu/hr

Maximum fuel oil consumption = 1,499 gal/hr

Maximum annual fuel oil consumption = 500,000 gal/yr

Hours operating on oil = 333.6 hr/yr

NO_x emission factor for oil burning = 67 lb/1000 gal

NO_x emission factor for bagasse burning = 1.2 lb/ton (wet)

NO_x due to oil firing at 225 x 10^6 Btu/hr = 100.4 lb/hr

Annual NO_x due to oil firing at 500,000 gal/yr = 17.0 tons/yr

test results + cond. (fuel) {prod}

55 lb/10^3 gal basis higher NO_x emission factor.

Revised NO_x emission calculations based upon the above data are provided below for the two potential steam operating conditions:

	Condition 1 (850 psig, 900°F)		Condition 2 (600 psig, 750°F)	
	6-hr avg.	Maximum	6-hr avg.	Maximum
Oil/Bagasse Burning				
Maximum Steam production due to oil (lb/hr) (at 1499 gal/hr)	145,795	145,795	155,172	155,172
Equivalent Operating Hours on maximum oil supplemented by bagasse	333.6	333.6	333.6	333.6
Maximum Steam production due to bagasse (lb/hr)	168,962 / 314757	200,436 / 346,231	179,828 / 335,000	213,328 / 368,500
Heat input due to bagasse (10^6 Btu/hr)	481.55 / + 225 / 706.55	552.20 / 777.2	481.55	552.20
Bagasse firing rate (lb/hr wet)	133,764 / x3600 / 481.55	153,389 / 552.2	133,764	153,389
NO_x due to bagasse (lb/hr)	80.26	92.03	-- same as Condition 1 --	
(tons/yr)	13.39	N/A	-- same as Condition 1 --	
NO_x due to oil burning (lb/hr)	100.4	100.4	-- same as Condition 1 --	
(tons/yr)	16.75	N/A	-- same as Condition 1 --	
Total NO_x due to oil/bagasse firing (lb/hr)	180.66	192.43	-- same as Condition 1 --	
(tons/yr)	30.14	N/A	-- same as Condition 1 --	
Bagasse Burning Only				
Operating hours (hr/yr)	3,506.4	3,506.4	-- same as Condition 1	
Bagasse firing rate (lb/hr wet)	196,264	215,889	-- same as Condition 1 --	
NO_x due to bagasse (lb/hr)	117.76	129.53	-- same as Condition 1 --	
(tons/yr)	206.46	N/A	-- same as Condition 1 --	
Total NO_x (tons/yr)	236.6	N/A	-- same as Condition 1 --	

was 136.7#/hr @ 545 SMBtu

ratio closed to proposed emissions

NOx test results why 67 lb/hr?

test results

4. Carbon Monoxide

Emission factor = 0.25 lb/10^6 Btu (bagasse burning)

Maximum: 777.20 x 10^6 Btu/hr x 0.25 lb/10^6 Btu = 194.3 lb/hr

6-hr average: 706.55 x 10^6 Btu/hr x 0.25 lb/10^6 Btu/hr = 176.6 lb/hr

Annual: 176.6 lb/hr x 24 hr/day x 160 day/yr / 2000 lb/ton

= 339.1 tons/yr

5. Volatile Organic Compounds high - test results

Emission factor = 1.7 lb/ton (wet) (bagasse burning) #bagasse/T bagasse

Maximum: 215,889 lb/hr bagasse x 1.7 lb/ton / 2000 = 183.5 lb/hr

6-hr average: 196,264 lb/hr bagasse x 1.7 / 2000 = 166.8 lb/hr

Annual: 166.8 lb/hr x 24 x 160 / 2000 = 320.3 tons/yr

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

DEPARTMENT OF ENVIRONMENTAL REGULATION
STATE OF FLORIDA

SOUTH FLORIDA DISTRICT

2269 BAY STREET
FORT MYERS, FLORIDA 33901-2896

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PHILIP R. EDWARDS
DISTRICT MANAGER

September 16, 1986

A. R. Mayo, Vice President, Sugar Houses
United States Sugar Corporation
Post Office Drawer 1207
Clewiston, FL 33440

Re: Hendry County - AP
U.S. Sugar Corporation
Clewiston Boiler No. 6
AO 26-123705

Dear Mr. Mayo:

In accordance with instructions from the Bureau of Air Quality Management the operating permit for Boiler No.6 is hereby modified as follows:

Specific Condition No. 8 is deleted in its entirety.

All other permit conditions remain as issued. This letter becomes a part of the operating permit for Boiler No. 6 and must be attached to that permit.

Sincerely,

Philip R. Edwards

Philip R. Edwards
District Manager

PRE/DMK/wlb
cc: Willard Hanks
Peter Cunningham

DER
SEP 19 1986
BAQM

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO	
ACTION DUE DATE	

1. TO: (NAME, OFFICE, LOCATION)	
	Initial
	Date
2. Willard Hanks	Initial
	Date
3. Bureau of Air Quality Mgmt	Initial
	Date
4. Tallahassee	Initial
	Date

REMARKS:

DER
SEP 19 1986
BAQM

INFORMATION	
	Review & Return
	Review & File
	Initial & Forward

DISPOSITION	
	Review & Respond
	Prepare Response
	For My Signature
	For Your Signature
	Let's Discuss
	Set Up Meeting
	Investigate & Report
	Initial & Forward
	Distribute
	Concurrence
	For Processing
	Initial & Return

FROM: David Knowles
Ft Myers

DATE 9-17-86

PHONE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTH FLORIDA DISTRICT

2269 BAY STREET
FORT MYERS, FLORIDA 33901-2896

DER
SEP 18 1986
BAQM

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PHILIP R. EDWARDS
DISTRICT MANAGER

September 15, 1986

A. R. Mayo, Vice President, Sugar Houses
United States Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

RE: HENDRY COUNTY - AP
U.S. SUGAR CORPORATION
CLEWISTON BOILER NO. 4
AO-26-115292

Dear Mr. Mayo:

In accordance with instructions from the Bureau of Air Quality Management the operating permit for Boiler No. 4 is hereby modified as follows:

SPECIFIC CONDITION NO. 17 is changed from:

17. The pellet mills at this plant shall be permanently shut down, made inoperative by disconnecting the electrical power or by other means as approved by the department, and the permits to operate surrendered to the South Florida District office prior to commercial operation of Boiler No. 4. The permits to operate boilers Nos. 5 and 6 are revised to provide that those boilers shall not be operated during any season until particulate matter emission test reports on Boilers Nos. 1 and 2 for that season have been received by South Florida District office and show particulate matter emissions from Boilers Nos. 1 and 2 do not exceed 0.25 lb/million Btu heat input.

To:

17. The pellet mills at this plant shall be permanently shut down, made inoperative by disconnecting the electrical power or by other means as approved by the department, and the permits to operate surrendered to the South Florida District office prior to commercial operation of Boiler No. 4. The allowable particulate matter emissions from Boilers Nos. 1 and 2, as determined by Reference Method 5 (40 CFR 60, Appendix A), is reduced to 0.25 lbs/10^6 Btu heat input from bagasse fuel.

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO	
ACTION DUE DATE	

1. TO: (NAME, OFFICE, LOCATION)	
1. File	Initial
	Date
2. ~~Hillard Hanks~~	Initial
	Date
3. Dzm - Bureau of Air Quality	Initial
	Date
4. Management Tallahassee	Initial
	Date

REMARKS:

DER
SEP 18 1986
BAQM

INFORMATION	
	Review & Return
	Review & File
	Initial & Forward

DISPOSITION	
	Review & Respond
	Prepare Response
	For My Signature
	For Your Signature
	Let's Discuss
	Set Up Meeting
	Investigate & Report
	Initial & Forward
	Distribute
	Concurrence
	For Processing
	Initial & Return

FROM: David Knowles
H Myers

DATE 9-15-86

PHONE

All other permit conditions remain as issued. This letter becomes a part of the operating permit for Boiler No. 4 and must be attached to that permit.

Sincerely,

Philip R. Edwards

Philip R. Edwards
District Manager

PRE/DMK/dbs

cc: Willard Hanks
Peter Cunningham

P 408 532 088

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Mr. A. R. Mayo	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 9/9/86	

PS Form 3800, Feb. 1982

PS Form 3811, July 1983 447-845

● **SENDER:** Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Mr. A. R. Mayo
U.S. Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number
P 408 532 083

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X [illegible]

6. Signature – Agent
X

7. Date of Delivery 9-11-86

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

September 8, 1986

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
U.S. Sugar Corporation
Post Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

Re: Modification of Conditions - Permit No. AC 26-80930

The department is in receipt of Mr. Peter C. Cunningham's August 21, 1986, letter requesting that Specific Condition No. 17 of the permit for Boiler No. 4 be modified to allow more flexibility in the operation of the boilers at this plant. This request is acceptable and the condition is modified as noted below.

From:

17. The pellet mills at this plant shall be permanently shut down, made inoperative by disconnecting the electrical power or by other means as approved by the department, and the permits to operate surrendered to the South Florida District office prior to commercial operation of Boiler No. 4. Prior to issuance of an operating permit for Boiler No. 4, the permits to operate boilers Nos. 5 and 6 shall be revised to provide that those boilers shall not be operated during any season until particulate matter emission test reports on Boilers Nos. 1 and 2 for that season have been received by South Florida District office and show particulate matter emissions from Boilers Nos. 1 and 2 do not exceed 0.25 lb/million Btu heat input.

To:

The pellet mills at this plant shall be permanently shut down, made inoperative by disconnecting the electrical power or by other means as approved by the department, and the permits to operate surrendered to the South Florida District office prior to commercial operation of Boiler No. 4. The allowable particulate matter emissions from Boilers Nos. 1 and 2, as determined by Reference Method 5 (40 CFR 60, Appendix A), is reduced to 0.25 lbs/10^6 Btu heat input from bagasse fuel.

Attachments to be Incorporated:

6. Peter C. Cunningham's letter of August 21, 1986.

Sincerely,

Victoria J. Tschinkel
Secretary

VJT/ks

cc: B. Miller, EPA Region IV
D. Knowles, South Florida District
P. Cunningham, Hopping Boyd Green and Sams

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

RECEIVED
SEP 8 1986
Office of the Secretary

FOR ROUTING TO OTHER THAN THE ADDRESSEE

To:	Loctn:
To:	Loctn:
To:	Loctn:
From:	Date:

TO: Victoria J. Tschinkel

FROM: Clair Fancy Clair Fancy

DATE: September 8, 1986

SUBJ: Modification of Conditions

Attached for your approval and signature is a letter that will modify the permit issued to U.S. Sugar Corporation. The modification will allow more flexibility in the operation of the boilers at this plant.

The Bureau recommends this modification be approved.

CHF/WH/s

attachment: letter

DER
SEP 9 1986
BAQM

HOPPING BOYD GREEN & SAMS

ATTORNEYS AND COUNSELORS

SUITE 420, FIRST FLORIDA BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

CARLOS ALVAREZ
BRIAN H. BIBEAU
WILLIAM L. BOYD, IV
PETER C. CUNNINGHAM
WILLIAM H. GREEN
WADE L. HOPPING
RICHARD D. MELSON
WILLIAM D. PRESTON
GARY P. SAMS
ROBERT P. SMITH, JR.

JAMES S. ALVES
KATHLEEN BLIZZARD
ELIZABETH C. BOWMAN
RICHARD S. BRIGHTMAN
ANNE W. CLAUSSEN
FRANK E. MATTHEWS
STEVEN A. MEDINA
CAROLYN S. RAEPPLE

OF COUNSEL
W. ROBERT FOKES

September 5, 1986

BY HAND DELIVERY THIS DATE

Victoria J. Tschinkel, Secretary
c/o Office of General Counsel
Florida Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: United States Sugar Corporation
Clewiston Mill Boiler No. 6
Permit No. AO26-123705
Request for Extension of Time for Filing

Dear Secretary Tschinkel:

On August 25, 1986, United States Sugar Corporation ("U. S. Sugar") received renewal Air Operation Permit No. AO26-123705 for Boiler No. 6 at its Clewiston Mill (the "Permit"). Pursuant to Florida Administrative Code Rule 17-103.155, U. S. Sugar has until September 8, 1986, to file a petition for administrative proceedings regarding the Permit.

I am writing on behalf of U. S. Sugar to request an extension of thirty (30) days, to and including October 8, 1986, for the filing of a petition for administrative proceedings regarding the Permit. This request is made pursuant to Section 17-103.070, Florida Administrative Code, which provides that a timely request for extension of time shall toll the running of the time period in which to file an appropriate petition. As good cause for granting this extension of time for filing, U. S. Sugar would show the following:

1. Specific Condition 8 the Permit issued by the Department prohibits operation of Boiler No. 6 prior to submission of test reports indicating a particulate matter emission rate for Boilers No. 1 and 2 at the Clewiston Mill equal to or less than 0.25 pounds per million Btu heat

input. This condition is based upon language in the Department air permits for Clewiston Mill Boiler No. 4.

2. U. S. Sugar has recently requested revision of the pertinent language in the Boiler No. 4 air permits that would delete the restriction on operation of Boiler No. 6. The Department is presently considering this request, and a response is expected in the near future.

3. If U. S. Sugar's request for revision of the Boiler No. 4 permit is granted, the language in Specific Condition 8 of the Boiler No. 6 permit will no longer be necessary or appropriate.

4. Grant of this extension request will allow the parties an opportunity to informally resolve the outstanding issues regarding the Clewiston Mill air permits without the need for initiation of formal administrative proceedings in this matter.

I hereby certify that I have spoken with Gary Early, Assistant General Counsel for the Department, and that he is in agreement with the grant of this request.

Accordingly, I respectfully request that you formally extend the time for filing of a petition for administrative proceedings regarding Air Operation Permit No. AO26-123705 to and including October 8, 1986.

Respectfully submitted,

Pete C. Cg

Peter C. Cunningham

PCC/gb

cc: E. Gary Early, Esquire
Willard Hanks
David Knowles

In the folder labeled as follows there are documents, listed below, which were not reproduced in this electronic file. That folder can be found in one of the file drawers labeled Supplementary Documents Drawer. Folders in that drawer are arranged alphabetically, then by permit number.

Folder Name: U.S. Sugar Corporation

Permit(s) Numbered:

AC	26	-	080930

Period during which document was received:		Detailed Description
APPLICATION 1 JUNE 1984	1.	24"×36" BLUEPRINT: BOILER NO 4 SCRUBBER SIZE D-200 (DRAWING NUMBER: CL.4-10 83.153 REV-1)

Check Sheet

Company Name: U.S. Sugar Corporation
Permit Number: AC26-080930
PSD Number:
Permit Engineer:

Application:

- ☐ Initial Application
  - ☐ Incompleteness Letters
  - ☒ Responses
  - ☐ Waiver of Department Action
  - ☐ Department Response
  - ☐ Other

Cross References:
- ☐ AO26-115292
- ☒ AO50-191891
- ☐ -182890

Intent:

- ☐ Intent to Issue
- ☐ Notice of Intent to Issue
- ☒ Technical Evaluation
- ☐ BACT or LAER Determination
- ☒ Unsigned Permit
- Correspondence with:
  - ☐ EPA
  - ☐ Park Services
  - ☐ Other
- ☐ Proof of Publication
  - ☐ Petitions - (Related to extensions, hearings, etc.)
  - ☐ Waiver of Department Action
  - ☐ Other

Final Determination:

- ☐ Final Determination
- ☒ Signed Permit
- ☒ BACT or LAER Determination
  - ☐ Other

Post Permit Correspondence:

- ☐ Extensions/Amendments/Modifications
- ☐ Other

AC 26-80930

JOB ASSIGNMENT

TO: Willard

No. ____________

FROM: C. Fancy

Date Due 9/15/86

DATE: 8/22/86

Status Report(s) Due ____________

Please accomplish the following job assignment by the date indicated and provide status reports if applicable.

Please investigate the attached letter on US Sugar Boiler #4. Looks like response will need to be closely coordinated with SF District

Proposed changes were discussed with David Knowles. No objection to proposed change offered. Letter drafted authorizing change for Secretary's signature. Forwarded for approval late ~~Sept~~ Aug.

Date Completed ____________ wmh
initials

If you have any questions or problems meeting the due date, please see me as soon as possible.

CF/dt

White Copy - Addressee
Canary Copy - Return to CF upon completion
Gold - ____________
Pink - File

cc: Bill Thomas

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
SUITE 420, FIRST FLORIDA BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

DER
AUG 21 1986
BAQM

August 21, 1986

BY HAND DELIVERY THIS DATE

Clair Fancy
Deputy Chief
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
2600 Blair Stone Road, Room 306
Tallahassee, Florida 32301

Re: United States Sugar Corporation
Clewiston Mill Boiler No. 4
Permit Number AC26-80930
Permit Number AO26-115292

Dear Mr. Fancy:

The Department has issued the above-referenced air permits for Boiler No. 4 at United States Sugar Corporation's Clewiston Mill. Specific Condition 17 of Permit No. AC26-80930 provides, in pertinent part, as follows:

> Prior to issuance of an operating permit for Boiler No. 4, the permits to operate boilers Nos. 5 and 6 shall be revised to provide that those boilers shall not be operated during any season until particular matter emission test reports on Boilers Nos. 1 and 2 for that season have been received by South Florida District office and show particulate matter emissions from Boilers Nos. 1 and 2 do not exceed 0.25 lb/million Btu heat input.

Specific Condition 17 of Permit No. AO26-115292 similarly provides, in pertinent part, as follows:

> The permits to operate boilers No.'s 5 and 6 are revised to provide that those boilers shall not be operated during any season until particulate matter emission test reports on Boilers No.'s 1 and 2 for that season have been received by the South Florida District office and show particulate matter emissions from Boilers No.'s 1 and 2 do not exceed 0.25 lb/million BTU heat input.

I am writing on behalf of U.S. Sugar Corporation to request that the Department revise the above-quoted language in Specific Condition 17 of these permits to eliminate the restriction concerning operation of Boilers No. 5 and 6 at the Clewiston Mill, for the reasons set forth below.

As you may recall, at the time the air construction permit for Boiler No. 4 was issued, the Department permits for Boilers No. 1, 2, 5 and 6 at the Clewiston Mill allowed a particulate emission rate of up to 0.3 pounds per million Btu heat input for each of those four boilers. In order to ensure compliance with air quality standards when Boiler No. 4 began operation, a slight reduction from the level of permitted particulate matter emissions was deemed appropriate. (Note that this conclusion was based on an assumed particulate matter emission rate of 0.2 pounds per million Btu heat input for Boiler No. 4, as compared to the 0.150 limit ultimately imposed in the Department's permits.) Specific Condition 17 of the air construction permit for Boiler No. 4 was thus developed, allowing U. S. Sugar the flexibility of either: (1) demonstrating that the particulate matter emissions from Boilers No. 1 and 2 did not exceed 0.25 pounds per million Btu heat input (as compared to the permitted rate of 0.3 pounds per million Btu heat input), in which case Boilers No. 5 and 6 could be operated, or, (2) keeping Boilers No. 5 and 6 out of operation, with no further restrictions on Boilers No. 1 and 2.

The flexibility intended under Specific Condition 17 of the Boiler No. 4 permit is no longer available, however, under the recently renewed air operating permits for Boilers No. 1 and 2. This is because the new air operating permits for Boiler No. 1 and 2 each now establish a particulate matter emissions limit of 0.25 pounds per million Btu heat input in lieu of the 0.3 limit in the previous permits.

(See Specific Condition 2 in the attached copies of Department Permits Number AO26-11030 and AO26-116614.) The reduction in particulate matter emissions from the Clewiston Mill contemplated by Specific Condition 17 of the Boiler No. 4 permits is thus assured as a result of the new, more stringent particulate matter emission limit imposed upon Boilers No. 1 and 2 under their currently effective and enforceable Department air operating permits. Consequently, there is no longer any need or justification for a restriction on the operation of Boilers No. 5 and 6 tied to a demonstration that Boilers No. 1 and 2 emissions do not exceed 0.25 pounds per million Btu heat input, since that is now the maximum permitted emission rate for the boilers. I would also point out that the results of annual stack testing performed at Boilers No. 1 and 2 over the past four years indicate that particulate emission rates have consistently been below 0.25 pounds per million But heat input.

U. S. Sugar anticipates that it will need to utilize Boilers No. 5 and 6 early in the upcoming sugar cane grinding season, which is scheduled to begin by late October, 1986. Under these circumstances, U. S. Sugar would like to be able to operate Boilers No. 5 and 6 without having to first test, and report on, the emissions rates for Boilers No. 1 and 2. Those boilers will, of course, be tested for their annual compliance demonstrations during the season.

In view of the reduction in the allowable particulate matter emissions for Boilers No. 1 and 2 under their current air operating permits, U. S. Sugar seeks deletion of the restriction on Boilers No. 5 and 6 in the Boiler No. 4 permits. Specifically, U. S. Sugar would request that the second sentence of Specific Condition 17 of Permits No. AO26-80930 and AO26-115292 be deleted and replaced with the following:

> Particulate matter emissions from Boilers No. 1 and 2 shall be limited to a rate not to exceed 0.25 pounds per million Btu heat input.

This permit revision would simply serve to recognize the more stringent emission limit now applicable to Boilers No. 1 and 2, while maintaining the assurance of compliance with air quality standards intended by the current language in Specific Condition 17.

Your expeditious attention to this request would be very much appreciated, as U. S. Sugar hopes that the necessary permit revisions can be accomplished prior to the commencement of the 1986-87 crop season. Please do not hesitate to call me if you or your staff have any questions on this matter.

Sincerely,

Peter C. Cunningham
Counsel for U. S. Sugar
Corporation

PCC/gb

cc: Bill Thomas
Willard Hanks
David Knowles
E. Gary Early, Esquire

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

DER

MAY 27 1986

BAQM

May 19, 1986

A. R. Mayo, Vice President, Sugar Houses
United States Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

RE: Hendry County - AP
U. S. Sugar Corp.
Clewiston Boiler #4
AC 26-80930

Dear Mr. Mayo:

Enclosed is Permit Number AO26-115292 to operate a sugar processing plant, boiler number 4, issued pursuant to Section(s) 403.087, Florida Statutes.

Persons whose substantial interests are affected by this permit have a right, pursuant to Section 120.57, Florida Statutes, to petition for an administrative determination (hearing) on it. The petition must conform to the requirements of Chapters 17-103 and 28-5.201, FAC, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee 32301, within fourteen (14) days of receipt of this notice. Failure to file a petition within the fourteen (14) days constitutes a waiver of any right such person has to an administrative determination (hearing) pursuant to Section 120.57, Florida Statutes. This permit is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with this paragraph or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, FAC. Upon timely filing of a petition or a request for an extension of time this permit will not be effective until further Order of the Department.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32301; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Final Order is filed with the Clerk of the Department.

Executed in Ft. Myers, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Philip R. Edwards
District Manager
2269 Bay Street
Ft. Myers, FL 33901-2896

Copies furnished to:

David A. Buff, P.E.
DER-Tallahassee

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on May 23, 1986 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to S 120.52 (J), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

CLERK 5/23/86 DATE

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTH FLORIDA
DISTRICT

2269 BAY STREET
FORT MYERS, FLORIDA 33901-2896

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PHILIP R. EDWARDS
DISTRICT MANAGER

PERMITTEE: A. R. Mayo, V.P., Sugar Houses
United States Sugar Corp.
P. O. Drawer 1207
Clewiston, FL 33440

I.D. Number: 52/26/0003/04
Permit/Certification Number: AO26-115292
Date of Issue: May 19, 1986
Expiration Date: May 19, 1991
County: Hendry
Latitude/Longitude: 26°44'05"N/80°56'19"W
Section/Township/Range: 21 & 22/43S/34E
Project: U. S. Sugar Corporation
Clewiston Boiler No. 4

This permit is issued under the provisions of Chapter(s) 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings(s), plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

Operate Boiler Number 4 with a steam production capacity of 250,000 LBS/HR during any consecutive six hour period or an instantaneous rate of 275,000 LBS/HR. Boiler is fired with bagasse and #6 residual oil having a combined heat input of 545.5 million BTU per hour, six hour average or an instantaneous rate of 600 million BTU per hour. Emissions are controlled by one (1) Joy Turbulaire Spray Impingement Scrubber, Type D, Size 200.

Plant is located near the intersection of W. C. Owens Avenue and Clewiston Street, Clewiston, Florida.

DER
MAY 27 1986
BAQM

PERMITTEE: U. S. Sugar Corporation

I.D. Number: 52/26/0003/04
Permit/Certification Number: A026-115292
Date of Issue: May 19, 1986
Expiration Date: May 19, 1991

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefor caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.

GENERAL CONDITIONS:

7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.

GENERAL CONDITIONS:

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD)
( ) Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)
( ) Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon Request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

__ the date, exact place, and time of sampling or measurements;
__ the person responsible for performing the sampling or measurements;
__ the date(s) analyses were performed;
__ the person responsible for performing the analyses;
__ the analytical techniques or methods used; and
__ the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. Steam production shall not exceed an average of 250,000 pounds per hour during any consecutive six hour period; or an instantaneous rate of 275,000 pounds per hour. The boiler shall be equipped with an instrument to continuously record steam production.

2. Heat input from No. 6 residual oil shall not exceed 225 million BTU per hour which is approximately equivalent to 1,500 gallons per minute of oil and 150,000 pounds per hour of steam. The boiler shall be built so that not more than two burners with two oil guns each (total of four oil guns) can be installed with a total maximum capcity not to exceed the permitted oil input.

3. During any 12 month period, the maximum quantity of No. 6 residual oil burned in boiler No. 4 shall not exceed 500,000 gallons.

4. During any 24 hour period, not more than 40,800 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. All permits to operate other oil burning equipment at this plant are revised to include this limitation.

5. During any 3 hour period, not more than 6,300 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. All permits to operate other oil burning equipment at this plant are revised to include this limitation.

6. All stationary fuel oil burning equipment at the plant shall be equipped with integrating fuel oil flow meters or continuous recorders to measure the amount to fuel oil consumed by the equipment. Oil meter readings on all oil consuming equipment shall be read and logged at least once every three hours unless oil consumption for the equipment is recorded continuously, and these records shall be kept for at least five years for department inspection. Each meter shall be calibrated annually by a method approved by the department.

7. Heat input to Boiler No. 4 from bagasse fuel or a combination of bagasse/oil fuels shall not exceed 545.5 million BTU per hour, six hour average, or an instantaneous rate of 600 million BTU per hour.

8. Prior to the expiration of this operating permit, a test shall be made on Boiler No. 4 to determine its actual thermal efficiency in accordnce with the ASME short-form procedure. This must be repeated each time the operating permit for this boiler is renewed. The test shall be done while the tubes are clean and within 14 days of the compliance test. A current report on the thermal efficiency test must be included with the application to renew the operating permit for this boiler.

SPECIFIC CONDITIONS:

9. The scrubber controlling the emissions from Boiler No. 4 shall be built to Joy Manufacturing Company's specifications for their Turbulaire, Type D, Size 200 spray impingement scrubber and shall be equipped with instruments to measure the gas pressure drop and pH of the scrubber water. Instruments to continuously record the scrubber water pressure and volumetric flow shall also be provided. During the first season of operation, hourly readings of the gas pressure drop shall be taken and logged for each day that Boiler No. 4 operates. The hourly data shall be converted into consecutive three hour averages. If any three hour average gas pressure drop falls more than ten percent below the average pressure drop recorded during the compliance test that showed compliance with the particulate matter standard, or any one hour reading is twenty-five percent below the average pressure drop recorded during the compliance test, the department will require a compliance test at the lower pressure drop and may also require the installation of an instrument to continuously measure and record the gas pressure drop.

   Hourly readings of the pH of the scrubber water shall be taken and logged for each hour during which bagasse is burned in Boiler No. 4 during its first 182 days of operation. The hourly data shall be converted into consecutive three hour averages. The department will be notified if chemicals are used to adjust pH. If any three hour average pH value falls more than ten percent below the pH that existed during the compliance test for sulfur dioxide, the department may require the installation of an instrument to continuously measure and record scrubber water pH.

   During compliance testing, the scrubber parameters shall be measured and recorded at 15 minute intervals.

   Records of the measurements required by this condition shall be obtained each day Boiler No. 4 operates during the first 182 days and copies of the records transmitted to the South Florida District and Bureau of Air Quality Management at the end of the season(s).

   After review of the first 182 days of data, the Bureau of Air Quality Management and the South Florida District will establish the scrubber parameters to be monitored and the frequency of monitoring. These requirements shall become a condition to any permit to operate issued to Boiler No. 4. The records required by the permit to operate shall be kept for five years for agency inspection.

10. Particulate matter emissions from boiler No. 4 shall not exceed 0.150 lb/million BTU heat input for bagasse fuel or 0.10 lb/million BTU heat input for No. 6 residual oil fuel. In the event that both fuels are burned concurrently, the allowable particulate matter emissions shall be prorated from the allowable standards for each fuel by their respective heat inputs.

SPECIFIC CONDITIONS:

10. (Cont'd.)

Compliance with the particulate matter standards shall be determined by EPA Reference Methods 1, 2, 3, 4, and 5 as described in 40 CFR 60, Appendix A. The compliance test results shall be calculated by assuming the thermal efficiency of Boiler 4 is 55 percent, or any new method subsequently adopted by department rule. For information purposes only, the particulate matter emission rate shall also be calculated by utilizing both the F factor (for each compliance test) and the short term ASME boiler efficiency test results (once every five years). Scrubber parameters listed in Specific Condition No. 9 shall be recorded every 15 minutes or continuously during the compliance test.

All compliance tests shall be conducted while the boiler is operating within 10 percent of its maximum or permitted capacity, whichever is lower. Such tests shall be conducted once per year commencing before February 15th. Results shall be submitted to the department within 45 days after testing. The South Florida District office shall be notified 15 days prior to any compliance test to allow witnessing.

11. Visible emissions from Boiler No. 4 shall not exceed 20 percent opacity except that 40 percent opacity is allowed for 2 minutes during any hour. Compliance with the standard shall be determined by DER Method 9 as described in Chapter 17-2, Florida Administrative Code. The particulate matter emissions and visible emissions shall be determined concurrently. Under circumstances when this is not feasible, the Company shall obtain prior approval from the South Florida District to conduct the tests at separate times. In such circumstances, the tests shall be conducted as close to each other as is feasible.

12. Any No. 6 residual fuel oil burned in this boiler shall contain no more than 2.50 percent sulfur and shall be replaced during the season in which it is burned with fuel oil containing no more than 1.50 percent sulfur. Compliance with this condition shall be determined from certified analysis of the replacement oil by ASTM Method D-129. Records of the quantity and analysis of fuel oil consumed in the No. 4 boiler and invoices for the oil purchased shall be kept for a minimum of five years for regulatory agency inspection.

13. Sulfur dioxide emissions from Boiler No. 4, while it is burning 100 percent bagasse fuel, shall not exceed 0.25 lb/million BTU heat input as determined by EPA Method 6 as described in 40 CFR 60, Appendix A. The compliance test results shall be calculated by assuming the thermal efficiency of Boiler No. 4 is 55 percent, or any new method subsequently adopted by department rule. For informational purposes only, the sulfur dioxide emission rate shall also be calculated by utilizing both the F factor (for each compliance test) and the short term ASME boiler efficiency test results (once every five years).

SPECIFIC CONDITIONS:

13. (Cont'd.)
Scrubber parameters listed in Specific Condition No. 9 shall be recorded every 15 minutes or continuously during the compliance test.

All compliance tests shall be conducted while the boiler is operating within 10 percent of its maximum or permitted capacity, whichever is lower. Such tests shall be conducted once per year commencing before February 15th. Results shall be submitted to the Department within 45 days after testing. The South Florida District Office shall be notified 15 days prior to any compliance test to allow witnessing.

Sulfur dioxide emissions from Boiler No. 4, while it is burning a mixture of oil and bagasse, shall not exceed 680 lb/hr.

14. Emissions of carbon monoxide and volatile organic compounds shall be maintained at the lowest possible level through the implementation of an Operation and Maintenance plan that is approved by the department. Emissions of carbon monoxide shall not exceed 0.25 lb/million BTU as determined by EPA Method 10. Emissions of volatile organic compounds shall not exceed 1.7 lb/ton of wet bagasse as determined by EPA Method 25. These test methods are described in 40 CFR 60, Appendix A. After the initial compliance tests, compliance tests for these pollutants will not be required if the visible emissions from Boiler No. 4 are below 20 percent opacity and the initial VOC Method 25 tests and intitial CO method 10 tests show compliance.

15. Visible emissions from the bagasse handling systems shall not exceed 10 percent opacity over any 6 minute period as measured by DER Method 9. Water spray or other effective means will be used to minimize fugitive emissions when reclaiming dry bagasse for the boiler.

16. Nitrogen oxides emissions, expressed as NO_2, shall not exceed 136.8 lb/hr as determined by EPA Reference Method 7 described in 40 CFR 60, Appendix A. After the initial compliance test, the Company may substitute an Operation and Maintenance plan that is approved by the department that optimized the NO_x emissions for the compliance tests specified in this specific condition if the initial Method 7 test shows compliance.

17. The pellet mills at this plant shall be permanently shut down, made inoperative by disconnecting the electrical power or by other means as approved by the department, and the permits to operate surrendered to the South Florida District office prior to commercial operation of Boiler No. 4. The permits to operate boilers No.'s 5 and 6 are revised to provide that those boilers shall not be operated during any season until particulate matter emission test reports on Boilers No.'s 1 and 2 for that season have been received by the South Florida District office and show particulate matter emissions from Boilers No.'s 1 and 2 do not exceed 0.25 lb/million BTU heat input.

SPECIFIC CONDITIONS:

18. Any permit to operate issued for Boiler No. 4 will limit operation to 182 days per season; require the scrubber to be operated at a six hour average pressure drop not less than 90 percent of the six hour average pressure drop that existed during the particulate matter test that showed compliance or not less than 75 percent of the average six hour pressure drop at any time; require, as a minimum, annual particulate matter and visible emission tests; an annual operation report which will include the amount of oil burned at the plant to determine compliance with the limits on oil usage in this permit, and the sulfur content of the residual oil purchased for the season; and a monthly summary of the scrubber parameters listed in Specific Condition No. 9.

19. Stack sampling facilities provided by the owner shall be in accordance with the requirements of Chapter 17-2.700(4), Florida Administrative Code.

Issued this 19th day of May, 1986.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Philip R. Edwards
District Manager

PRE/OO/ls

_____ Pages Attached

Permit File

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

January 30, 1986

Mr. Peter Cunningham Esq.
Hopping, Boyd, Green, & Sams
P. O. Box 6526
Tallahassee, Florida 32314

Dear Peter:

Re: U.S. Sugar Corporation
Permit No. AC 26-80930
Your letter of January 15, 1986

This is to confirm that your letter referenced above reflects the essence of our discussions. The "commercial operation" was intended as a statement of intent to preserve design verification priorities.

I anticipate that such a provision will be included in 17-2 in the future and appreciate the benefit of your thoughts on the matter resulting from our discussions on this permit.

Sincerely,

W A Thomas

William A. Thomas, P.E.
Chief Engineer
Bureau of Air Quality
Management

WAT/ks

cc: Clair Fancy
Aryan Mayo
Peter Barquin

A0106

D.K.

RECEIVED

JAN 29 1986

D.E.R. SO. FLA. DISTRICT

Tallahassee Copy

115292

3793

pd. $500

DEPARTMENT OF ENVIRONMENTAL REGULATION STATE OF FLORIDA

May 19, 1986

PERMIT A026-115292

O.O

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

AIR POLLUTION SOURCES
CERTIFICATE OF COMPLETION OF CONSTRUCTION*

PERMIT NO. AC 26-80930 DATE: January 11, 1985

Company Name: U.S. Sugar Corporation County: Hendry

Source Identification(s): Boiler No. 4

Actual costs of serving pollution control purpose: $ 295,000

Operating Rates: 50,000/275,000 lb/hr @ 850 psig, 900°F * or 50,000/292,600 lb/hr @ 600 psig, 750°F Design Capacity: 300,000 lb/hr steam @ 875 psig, 900°F

Expected Normal *250,000 lb/hr steam @ 850 psig, 900°F 266,000 lb/hr steam @ 600 psig, 750°F During Compliance Test 259,970 lb/hr steam @ 600 psig

Date of Compliance Test: December 23, 1985 (Attach detailed test report)

Test Results:

Pollutant	Actual Discharge	Allowed Discharge
Particulate Matter	0.148 $lb/10^6$ Btu	0.150 $lb/10^6$ Btu
Sulfur Dioxide	0.0016 $lb/10^6$ Btu	0.25 $lb/10^6$ Btu
Nitrogen Oxides	73.83 lb/hr	136.8 lb/hr

Date plant placed in operation: Ran 9 days in March 1985, then shutdown for off-season, and was restarted October 31, 1985

This is to certify that, with the exception of deviations noted**, the construction of the project has been completed in accordance with the application to construct and Construction Permit No. AC 26-80930 dated January 11, 1985.

A. Applicant:

Mr. A. R. Mayo
Name of Person Signing (Type)

A. R. Mayo Vice President, Sugar Houses
Signature of Owner or Authorized Representative and Title

Date: January 27, 1986 Telephone: 813/983-8121

B. Professional Engineer:

David A. Buff
Name of Person Signing (Type)

David A. Buff
Signature of Professional Engineer

KBN Engineering and Applied Sciences, Inc.
Company Name

Florida Registration No. 19011

Date: 1-24-86

(Seal)

P.O. Box 14288, Gainesville, FL 32604
Mailing Address

904/375-8000
Telephone Number

*This form, satisfactorily completed, submitted in conjunction with an existing application to construct permit and payment of application processing fee will be accepted in lieu of an application to operate.

**As built, if not built as indicated include process flow sketch, plot plan sketch, and updates of applicable pages of application form.

*This is a dual pressure boiler. The boiler can operate at either condition with a heat input rate of 545.5 x 10^6 Btu/hr.

DEPARTMENT OF ENVIRONMENTAL REGULATION
May 19, 1986
PERMIT
A026-115292
OD
STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION
STATE OF FLORIDA

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

AIR POLLUTION SOURCES
CERTIFICATE OF COMPLETION OF CONSTRUCTION*

PERMIT NO. ______ DATE: ______

Company Name: ______ County: ______

Source Identification(s): ______

Actual costs of serving pollution control purpose: $ ______

Operating Rates: ______ Design Capacity: ______

Expected Normal ______ During Compliance Test ______

Date of Compliance Test: ______ (Attach detailed test report)

Test Results:

Pollutant	Actual Discharge	Allowed Discharge
carbon monoxide	below minimum detectable	0.25 $lb/10^6$ Btu
volatile organic cmpds.	1.32 lb/ton wet bagasse*	1.7 lb/ton wet bagasse

20,171 # MM BTU

Date plant placed in operation: ______

*based upon average VOC emissions of 98.5 lb and wet bagasse firing rate of 74.96 tons/hr

This is to certify that, with the exception of deviations noted**, the construction of the project has been completed in accordance with the application to construct and Construction Permit No. ______ dated ______.

A. Applicant:

______ Name of Person Signing (Type)

______ Signature of Owner or Authorized Representative and Title

Date: ______ Telephone: ______

B. Professional Engineer:

______ Name of Person Signing (Type)

______ Signature of Professional Engineer

______ Company Name

Florida Registration No. ______

Date: ______

(Seal)

______ Mailing Address

______ Telephone Number

*This form, satisfactorily completed, submitted in conjunction with an existing application to construct permit and payment of application processing fee will be accepted in lieu of an application to operate.

**As built, if not built as indicated include process flow sketch, plot plan sketch, and updates of applicable pages of application form.

ATTACHMENT A

Updated Page 6 of 12 of Permit Application, reflecting change in stack diameter and actual stack condition.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 150 ft. Stack Diameter: 8.25 ft.

Gas Flow Rate: 186,550* ACFM 120,940* DSCFM Gas Exit Temperature: 154 °F.

Water Vapor Content: 28 % Velocity: 58.5* FPS

* At 260,000 lb/hr avg. steam production

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (lbs/hr)							

Description of Waste ______

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ______

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO	
ACTION DUE DATE	

1. TO: (NAME, OFFICE, LOCATION) CLAIR FANCY, BAQM	Initial
	Date
2. TALLAHASSEE	Initial
	Date
3.	Initial
	Date
4.	Initial
	Date

REMARKS:

U.S. Sugar Corp.
Boiler #4

A026-115292

DER
MAY 27 1986
BAQM

INFORMATION	
	Review & Return
	Review & File
	Initial & Forward

DISPOSITION	
	Review & Respond
	Prepare Response
	For My Signature
	For Your Signature
	Let's Discuss
	Set Up Meeting
	Investigate & Report
	Initial & Forward
	Distribute
	Concurrence
	For Processing
	Initial & Return

FROM: SOUTH FLORIDA DIST.
FORT MYERS

DATE 5-22-86

PHONE

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
SUITE 420, FIRST FLORIDA BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

CARLOS ALVAREZ
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RICHARD S. BRIGHTMAN
ANNE W. CLAUSSEN
FRANK E. MATTHEWS
STEVEN A. MEDINA
CAROLYN S. RAEPPLE

OF COUNSEL
W. ROBERT FOKES

January 15, 1986

1/15
Bill T—
please answer
this by Friday—
I'd like to see response
before it goes.
Clair

BY HAND DELIVERY

William Thomas, P.E.
Central Air Permitting Section
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: U. S. Sugar Corporation
Permit No. AC 26-80930
Modification of Conditions

Dear Bill:

As we discussed last week, U. S. Sugar Corporation has received Secretary Tschinkel's letter of December 20, 1985, modifying the referenced air construction permit for its Clewiston Boiler No. 4. While U. S. Sugar appreciates the extension of the permit expiration date granted by the Department, we have some concerns about the new sentence added to Specific Condition 18 by the Secretary's letter ("The boiler shall not be operated commercially until all required compliance tests are completed."). I am writing on behalf of U. S. Sugar to confirm our understanding of that sentence based upon my conversation with you on this point.

We understand that the new sentence regarding "commercial operation" of Boiler No. 4 relates to operation subsequent to U. S. Sugar's receipt of the Secretary's letter, and is not intended to cover prior operation of the boiler. Based on the above understanding, U. S. Sugar finds the permit modification specified in Secretary Tschinkel's December 20, 1985 letter to be acceptable.

Your continued consideration in this matter is much appreciated.

Sincerely,

Peter

Peter C. Cunningham

PCC/gb

cc: Clair Fancy
Aryan Mayo
Peter Barquin

P 408 533 642

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Mr. A. R. Mayo	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 12/26/85	

PS Form 3800, Feb. 1982

PS Form 3811, July 1983

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:
Mr. A. R. Mayo
U.S. Sugar Corporation
Post Office Drawer 1207
Clewiston, FL 33440

4. Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail

Article Number
P 408 533 642

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X

6. Signature – Agent
X [signature]

7. Date of Delivery
12/

8. Addressee's Address *(ONLY if requested and fee paid)*

DOMESTIC RETURN RECEIPT

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

December 20, 1985

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
U.S. Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

Re: Modification of Conditions - Permit No. AC 26-80930

The Department is in receipt of Mr. Peter Cunningham's December 11, 1985, letter requesting the permit to construct Boiler No. 4 be modified to allow additional time to debug the unit, test its emissions, prepare a test report, and submit an application for permit to operate the boiler. The request is acceptable in principal, and the permit is modified as noted below.

Original Conditions:

Expiration Date - March 11, 1986

Specific Condition No. 18 - The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operate to the South Florida District Office 60 days prior to the March 11, 1986, expiration date of this construction permit or 60 operating days after initial start-up of Boiler No. 4, whichever date occurs first. The boiler may continue to operate in compliance with all terms of this construction permit until its expiration date.

Revised Conditions:

Expiration Date - April 11, 1986

Specific Condition No. 18 - The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operate to the South Florida District Office on or before February 11, 1986.

The boiler shall not be operated commercially until all required compliance tests are completed. The boiler may continue to operate in compliance with all terms of this construction permit until its expiration date.

Attachments to be Incorporated:

7. Peter C. Cunningham's letter dated December 11, 1985.

A copy of this letter must be attached to the referenced construction permit and shall become a part of that permit.

Sincerely

Victoria J. Tschinkel

Victoria J. Tschinkel
Secretary

VJT/ks

cc: D. Knowles
P. C. Cunningham

attachment December 11, 1985, letter

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
SUITE 420, FIRST FLORIDA BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

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FRANK E. MATTHEWS
STEVEN A. MEDINA
CAROLYN S. RAEPPLE

OF COUNSEL
W. ROBERT FOKES

December 11, 1985

BY HAND DELIVERY

Clair Fancy
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: U. S. Sugar Corporation
Clewiston Boiler No. 4
Air Construction Permit No. AC 26-80930

Dear Clair:

I am writing on behalf of U. S. Sugar Corporation to request a slight change in one of the conditions of the referenced construction permit to allow additional time for initial shakedown operation, debugging and testing of Clewiston Boiler No. 4.

Specific Condition No. 18 of the permit now requires U. S. Sugar to demonstrate compliance with the conditions of the permit and to submit a complete application for an operating permit 60 days prior to the March 11, 1986 permit expiration date or 60 operating days after initial startup of Boiler No. 4, whichever date first occurs. Other conditions of the construction permit provide that the operating permit application will include results of emissions testing for particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide and volatile organic compounds, as well as an actual thermal efficiency test and calculation of the particulate emission rate based on actual thermal efficiency and the F-factor.

As we discussed by telephone the other day, operating experience with Clewiston Boiler No. 4 since the beginning of the current crop season has resulted in U. S. Sugar's decision to replace the Boiler's induced draft fan motors in an attempt to improve combustion characteristics and efficiency. Under the circumstances, and with the upcoming holiday season, it would be extremely burdensome to locate and install a suitable motor and ancilliary equipment, to complete the necessary debugging, tuning and testing, and to prepare the required test reports and the operating permit application, within the time frame now established under Specific Condition No. 18.

To provide a more reasonable time frame for these activities, U. S. Sugar requests that the Department revise the first sentence of Specific Condition No. 18 of Air Construction Permit No. AC 26-80930 to read as follows:

> 18. The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operate to the South Florida District office by February 11, 1986.

* * *

This change would extend the deadline for submitting an operating permit by about one month, thus providing the time needed to allow the required activities to be performed in a careful and deliberate manner. U. S. Sugar is not requesting an extension of the construction permit expiration date. Under the revised language set forth above, the operating permit application would be due one month prior to the permit expiration date.

U. S. Sugar would greatly appreciate your expeditious consideration of this request, as scheduling of testing must be addressed in the very near future. If you have any questions about the requested permit revision, please call me.

Sincerely,

Peter C. Cunningham

PCC/gb

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

DER
DEC 23 1985
BAQM

FOR ROUTING TO OTHER THAN THE ADDRESSEE

To: Clair Fancy	Loctn:
To:	Loctn:
To:	Loctn:
From: Vicki	Date: 12/20

TO: Victoria J. Tschinkel

FROM: Clair Fancy Clair Fancy

DATE: December 20, 1985

SUBJ: Modification of Conditions

Attached for your approval and signature is a letter that will extend the expiration date of a construction permit issued to U.S. Sugar Corporation. This extension will allow time for the applicant to debug the unit, tests its emissions, prepare a tests report, and submit an application for permit to operate the source.

The Bureau recommends this extension be approved.

WH/ks

attachment: Permit Modification Letter

DER
DEC 11 1985
BAQM

HOPPING BOYD GREEN & SAMS

ATTORNEYS AND COUNSELORS

SUITE 420, FIRST FLORIDA BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

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STEVEN A. MEDINA
CAROLYN S. RAEPPLE

OF COUNSEL
W. ROBERT FOKES

December 11, 1985

BY HAND DELIVERY

Clair Fancy
Bureau of Air Quality Management
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: U. S. Sugar Corporation
Clewiston Boiler No. 4
Air Construction Permit No. AC 26-80930

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As we discussed by telephone the other day, operating experience with Clewiston Boiler No. 4 since the beginning of the current crop season has resulted in U. S. Sugar's decision to replace the Boiler's induced draft fan motors in an attempt to improve combustion characteristics and efficiency. Under the circumstances, and with the upcoming holiday season, it would be extremely burdensome to locate and install a suitable motor and ancilliary equipment, to complete the necessary debugging, tuning and testing, and to prepare the required test reports and the operating permit application, within the time frame now established under Specific Condition No. 18.

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> 18. The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operate to the South Florida District office by February 11, 1986.

* * *

This change would extend the deadline for submitting an operating permit by about one month, thus providing the time needed to allow the required activities to be performed in a careful and deliberate manner. U. S. Sugar is not requesting an extension of the construction permit expiration date. Under the revised language set forth above, the operating permit application would be due one month prior to the permit expiration date.

U. S. Sugar would greatly appreciate your expeditious consideration of this request, as scheduling of testing must be addressed in the very near future. If you have any questions about the requested permit revision, please call me.

Sincerely,

Peter C. Cunningham

PCC/gb

PS Form 3811, July 1983

SENDER: Complete items 1, 2, 3 and 4.

Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1. ☐ Show to whom, date and address of delivery.
2. ☐ Restricted Delivery.

3. Article Addressed to:

Mr. A. R. Mayo
U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, FL 33440

4. Type of Service:	Article Number
☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail	P 408 533 628

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature – Addressee
X C. Mizzo

6. Signature – Agent
X

7. Date of Delivery
10/18/85

8. Addressee's Address *(ONLY if requested and fee paid)*
Od

DOMESTIC RETURN RECEIPT

P 408 533 628

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to Mr. A. R. Mayo	
Street and No.	
P.O., State and ZIP Code	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date 10/16/85	

PS Form 3800, Feb. 1982

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

October 11, 1985

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
U.S. Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

Re: Modification of Conditions - Permit No. AC 26-80930

The Department is in receipt of Mr. Peter Cunningham's September 27, 1985, letter requesting the permit to construct Boiler No. 4 be extended to allow additional time to debug the unit, test its emissions, prepare a test report, and submit an application for permit to operate the boiler. The request is acceptable and the expiration date is changed as noted below. We are also correcting a unit error in Specific Condition No. 2.

<u>Original Conditions</u>:

Expiration Date - January 11, 1986

Specific Condition No. 2 - Heat input from No. 6 residual oil shall not exceed 225 million Btu per hour which is approximately equivalent to 1,500 gallons per minute of oil and 150,000 pounds per hour of steam. The boiler shall be built so that not more than two burners with two oil guns each (total of four oil guns) can be installed with a total maximum capacity not to exceed the permitted oil input.

Specific Condition No. 18 - The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operate to the South Florida District Office 90 days prior to the January 11, 1986, expiration date of this construction permit or 60 days after initial start-up of Boiler No. 4, whichever date occurs first. The applicant may continue to operate in compliance with all terms of this construction permit until its expiration date.

<u>Revised Conditions</u>:

Expiration Date - March 11, 1986

Specific Condition No. 2 - Heat input from No. 6 residual oil shall not exceed 225 million Btu per hour which is approximately equivalent to 1,500 gallons per hour of oil and 150,000 pounds per hour of steam. The boiler shall be built so that not more than two burners with two oil guns each (total of four oil guns) can be installed with a total maximum capacity not to exceed the permitted oil input.

Specific Condition No. 18 - The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operate to the South Florida District Office 60 days prior to the March 11, 1986, expiration date of this construction permit or 60 operating days after initial start-up of Boiler No. 4, whichever date occurs first. The boiler may continue to operate in compliance with all terms of this construction permit until its expiration date.

<u>Attachments to be Incorporated</u>:

6. Peter C. Cunningham's letter dated September 27, 1985.

A copy of this letter must be attached to the referenced construction permit and shall become a part of that permit.

Sincerely,

Victoria J. Tschinkel

Victoria J. Tschinkel
Secretary

VJT/ps

cc: David Knowles
Peter C. Cunningham

attachment: September 27, 1985, letter

DER

SEP 27 1985

BAQM

HOPPING BOYD GREEN & SAMS

ATTORNEYS AND COUNSELORS

SUITE 420, FIRST FLORIDA BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

CARLOS ALVAREZ
BRIAN H BIBEAU
WILLIAM L. BOYD, IV
PETER C. CUNNINGHAM
WILLIAM H. GREEN
WADE L. HOPPING
RICHARD D. MELSON
WILLIAM D. PRESTON
GARY P. SAMS
ROBERT P. SMITH, JR.

JAMES S. ALVES
KATHLEEN BLIZZARD
ELIZABETH C. BOWMAN
RICHARD S. BRIGHTMAN
FRANK E. MATTHEWS
STEVEN A. MEDINA
CAROLYN S. RAEPPLE

OF COUNSEL
W. ROBERT FOKES

September 27, 1985

BY HAND DELIVERY

Clair Fancy
Deputy Chief
Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: U. S. Sugar Corporation
Clewiston Boiler No. 4
Air Construction Permit No. AC 26-80930

Dear Clair:

I am writing on behalf of U. S. Sugar Corporation to request a revision of the referenced construction permit. As we have previously discussed, U. S. Sugar was able to operate newly-constructed Clewiston Boiler No. 4 for only approximately ten days before the end of the last crop season, leaving insufficient time for initial operation, debugging and testing. The new crop season will begin in late October of this year, and operation of the boiler will not recommence until then.

Under these circumstances, it will be impossible to meet the deadlines for completing compliance demonstrations and filing an operating permit application imposed by Specific Condition No. 18 of the permit, which requires U. S. Sugar to

> demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operate to the South Florida District Office 90 days prior to the January 11, 1986, expiration date of this construction permit or 60 days after initial startup of Boiler No. 4, whichever date occurs first.

To provide the necessary time for debugging and testing along with preparation of test reports and an operating permit application, U. S. Sugar requests that the Department revise Air Construction Permit No. AC 26-80930 by extending its expiration date until March 11, 1986, and revising the first sentence of Specific Condition No. 18 to read as follows:

> 18. The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operate to the South Florida District Office 60 days prior to the March 11, 1986 expiration date of this construction permit or 60 operating days after initial start-up of Boiler No. 4, whichever date occurs first.

I believe this revision would be in accordance with Florida Administrative Code Rule 17-2.210(1), which provides that air construction permits

> shall be issued for a period of time sufficient to allow construction of the source and operation while the new or modified source is beginning operation and conducting tests to determine whether the source is in compliance with applicable emission limiting standards.

As always, your consideration in this matter is much appreciated. If you have any questions about the requested permit revision, please call me.

Sincerely,

Peter

Peter C. Cunningham

PCC/gb

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

FOR ROUTING TO OTHER THAN THE ADDRESSEE	
To:	Loctn:
To:	Loctn:
To:	Loctn:
From:	Date:

RECEIVED
OCT 10 1985
Office of the Secretary

TO: Victoria J. Tschinkel

FROM: for Clair Fancy
A. W. George

DATE: October 10, 1985

SUBJECT: Modification of Conditions

Attached for your approval and signature is a letter that will extend the expiration date of a construction permit issued to U.S. Sugar Corporation. This extension will allow time for the applicant to debug the unit, tests its emissions, prepare a tests report, and submit an application for permit to operate the source.

The Bureau recommends this extension be approved.

WH/ps

attachment: Permit modification letter

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
SUITE 420, FIRST FLORIDA BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

DER
SEP 27 1985
BAQM

September 27, 1985

BY HAND DELIVERY

Clair Fancy
Deputy Chief
Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: U. S. Sugar Corporation
Clewiston Boiler No. 4
Air Construction Permit No. AC 26-80930

Dear Clair:

I am writing on behalf of U. S. Sugar Corporation to request a revision of the referenced construction permit. As we have previously discussed, U. S. Sugar was able to operate newly-constructed Clewiston Boiler No. 4 for only approximately ten days before the end of the last crop season, leaving insufficient time for initial operation, debugging and testing. The new crop season will begin in late October of this year, and operation of the boiler will not recommence until then.

Under these circumstances, it will be impossible to meet the deadlines for completing compliance demonstrations and filing an operating permit application imposed by Specific Condition No. 18 of the permit, which requires U. S. Sugar to

> demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operate to the South Florida District Office 90 days prior to the January 11, 1986, expiration date of this construction permit or 60 days after initial startup of Boiler No. 4, whichever date occurs first.

To provide the necessary time for debugging and testing along with preparation of test reports and an operating permit application, U. S. Sugar requests that the Department revise Air Construction Permit No. AC 26-80930 by extending its expiration date until March 11, 1986, and revising the first sentence of Specific Condition No. 18 to read as follows:

> 18. The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operate to the South Florida District Office 60 days prior to the March 11, 1986 expiration date of this construction permit or 60 operating days after initial start-up of Boiler No. 4, whichever date occurs first.

I believe this revision would be in accordance with Florida Administrative Code Rule 17-2.210(1), which provides that air construction permits

> shall be issued for a period of time sufficient to allow construction of the source and operation while the new or modified source is beginning operation and conducting tests to determine whether the source is in compliance with applicable emission limiting standards.

As always, your consideration in this matter is much appreciated. If you have any questions about the requested permit revision, please call me.

Sincerely,

Peter

Peter C. Cunningham

PCC/gb

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

MAY 07 1985

DER
MAY 10 1985
BAQM

REF: 4APT-AM

Mr. Clair H. Fancy, P.E.
Bureau of Air Quality Management
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

RE: PSD-FL-100 U.S. Sugar Corp., Bagasse Boiler No. 4

Dear Mr. Fancy:

This is to acknowledge receipt of your January 11, 1985, PSD final determination for the above referenced project. As indicated in our December 1984, letter to you, the preliminary determination was selected for review under our overview policy.

In the preliminary determination, we had concern that short term SO_2 increments may be violated. However, in discussions between Mr. Willard Hanks of your staff and Mr. Michael Brandon of my staff, it was learned that total plant sulfur dioxide emissions would be effectively controlled to 680 lbs/hr and thereby protecting increment through baseline reductions (e.g. increment expansion). We, therefore, concur with your determinations and permit conditions as indicated.

We will retain copies of these documents for our files.

Sincerely yours,

Jesse Baskerville

James T. Wilburn, Chief
Air Management Branch
Air, Pesticides, & Toxics Management Division

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee		
To:	Loctn.:	
To:	Loctn.:	
To:	Loctn.:	
From:	Date:	
Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due:	Date Due:	

TO: Victoria J. Tschinkel

FROM: Clair Fancy

DATE: February 14, 1985

SUBJ: Modification of Air Construction Permit

This was not mailed
wh

Attached is a letter drafted for your signature that will modify a specific condition that restricted steam production in permit No. AC 26-80930 that was issued to U.S. Sugar Corporation for their No. 4 bagasse/oil fired boiler.

The Bureau of Air Quality Management recommends that the modification be approved.

CHF/WH/s

attachment:

Clair,
I have problems with this. Please don't sign it until we discuss
VT

2-20
Willard
Just write Mayo with cc to Peter's district saying we will consider it once boiler is operating and tests have been done - i.e. they can prove heat input will still stay below the limit.
In same letter also address [illegible] in a tactful manner.
Clair

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

BAQM - Central Air Permitting

ACTION NO.

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION)

1.	~~FANCY~~ Otto	AMODIO	MITCHELL	HERON
2.	PALAGYI	VEGA	BOCK	GEORGE
3.	HODGES	~~THOMAS~~ Bob	HANKS	ROGERS
4.	POWELL	SVEC	KING	HOLLADAY

INITIAL / DATE

INITIAL / DATE

INITIAL / DATE

INITIAL / DATE

REMARKS:

We need to reply to U.S. Sugar's letter to avoid them getting it by default. Suggested reply attached. Please add comments/corrections you recommend.

I agree we need to respond

INFORMATION
- REVIEW & RETURN
- REVIEW & FILE
- INITIAL & FORWARD

DISPOSITION
- REVIEW & RESPOND
- PREPARE RESPONSE
- FOR MY SIGNATURE
- FOR YOUR SIGNATURE
- LET'S DISCUSS
- SET UP MEETING
- INVESTIGATE & REPT
- INITIAL & FORWARD
- DISTRIBUTE
- CONCURRENCE
- FOR PROCESSING
- INITIAL & RETURN

FROM: [illegible signature]

DATE 2-7-85

PHONE

February 15, 1985

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
U.S. Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

Re: Modification of Conditions - Permit No. AC 26-80930

The department is in receipt of Mr. Cunningham's letter dated January 30, 1985, that requested the steam production limits specified in Specific Condition No. 1 of the subject permit be revised. In principal, this request is acceptable and Specific Condition No. 1 has been modified to allow the actual steam production rates to be revised in ~~a~~ the Permit to Operate this source.

<u>Original Specific Condition</u>

1. Steam production shall not exceed an average of 250,000 pounds per hour during any consecutive six hour period; or an

instantaneous rate of 275,000 pounds per hour. The boiler shall be equipped with an instrument to continuously record stream production.

Revised Specific Condition

1. Steam production shall not exceed an average of 250,000 pounds per hour during any consecutive six hour period; or an instantaneous rate of 275,000 pounds per hour. The department may consider specifying other steam production limits that provide reasonable assurance that the boiler will comply with all air pollution control regulations and permit conditions (including Specific Condition No. 7) in any permit to operate that may be issued for this source. The boiler shall be equipped with instruments to continuously record steam production.

Attachment to be Incorporated

Mr. Peter C. Cunningham's letter dated January 30, 1985.

A copy of this letter must be attached to the referenced construction permit and shall become a part of that permit.

Sincerely,
Victoria J. Tschinkel
Secretary

VJT/ks

cc: James T. Wilburn
Philip Edwards
Peter Cunningham

attachment: Letter dated January 30, 1985

O9/WH/ARMAYO

February ~~8~~ 15, 1985

Spec cert

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

Re: Modification of Conditions - Permit No. AC 26-80930

The department is in receipt of Mr. Cunningham's letter dated January 30, 1985, that requested the steam production limits specified in Specific Condition No. 1 of the ~~subject~~ referenced permit be revised.

In the Preliminary Determination of the ~~subject~~ referenced construction permit, the Department proposed a limit of 250,000 lb/hr steam production in Specific Condition No. 1 as was specified in the application. All material, energy, and air pollution emission calculations in the application were based on 250,000 lb/hr designed steam production. In the Final Determination, the Department revised Specific Condition No. 1, at U.S. Sugar Corporation's request, to allow for normal fluctuations in steam production.

The Department does not have sufficient information to evaluate your latest request. We believe that the boiler's efficiency is affected by the pressure and temperature of the steam produced.

The latest permit modification you are requesting could change the material, energy, and emission balances that the original application is based on. For that reason, we are denying the January 30, 1985, request to revise Specific Condition No. 1. U.S. Sugar Corporation should submit a new application for permit to construct if they need to change the operating conditions originally proposed for this boiler.

Sincerely,

Victoria J. Tschinkel

Secretary

VJT/ks

cc: James T. Wilburn

Philip Edwards

Peter Cunningham

attachment: January 30, 1985 letter

2/13

The letter was to me as a comment on the final. I thought we were going to say we would carefully examine the data & would consider the changes for the operating permit if the facts supported this.

Clair

draft requested by CF

February ~~3~~ 15, 1985

WH/MAYO

Not mailed

letter denying request drafted 2/7/85

2/13/85 clair implied we revise in future. Draft LB7 2/13

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
U.S. Sugar Corporation
Spell out P. O. Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

Re: Modification of Conditions - Permit No. AC 26-80930

The department is in receipt of Mr. Cunningham's letter dated January 30, 1985, that requested the steam production limits specified in Specific Condition No. 1 of the subject permit be revised. In principal, this request is acceptable and Specific Condition No. 1 has been modified to allow the actual steam production rates to be revised in a Permit to Operate this source. ~~Specific Condition No. 18 is also changed to allow the applicant more flexibility in applying for a Permit to Operate this source.~~

Original Specific Condition ~~s~~

1. Steam production shall not exceed an average of 250,000 pounds per hour during any consecutive six hour period; or an

instantaneous rate of 275,000 pounds per hour. The boiler shall be equipped with an instrument to continuously record stream production.

~~10. The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operte to the South Florida District Office 90 days prior to the January 11, 1986, expiration date of this construction permit or 60 days after initial start-up of Boiler No. 4, whichever date occurs first. The applicant may continue to operate in compliance with all terms of this construction permit until its expiration date.~~

Revised Specific Conditions

1. Steam production shall not exceed an average of 250,000 pounds per hour during any consecutive six hour period; or an instantaneous rate of 275,000 pounds per hour. The department may consider specifying other steam production limits that provide reasonable assurance that the boiler will comply with all air pollution control regulations and permit conditions (including Specific Condition No. 7) in any permit to operate that may be issued for this source. The boiler shall be equipped with instruments to continuously record steam production.

~~18. The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operte to the South Florida District Office 90 days prior to the January 11, 1986, expiration date of~~

this construction ~~permit~~ or, if feasible~~, 60 days after~~ ~~initial~~ start-up ~~of Boiler No. 4, whichever date occurs first.~~ The applicant ~~may continue to operate in compliance with all terms of this construction permit until its expiration date.~~

Attachment~~s~~ to be Incorporated

Mr. Peter C. Cunningham's letter dated January 30, 1985.

A copy of this letter must be attached to the referenced construction permit and shall become a part of that permit.

Sincerely,

Victoria J. Tschinkel
Secretary

VJT/ks

cc: James T. Wilburn
Philip Edwards
Peter Cunningham

attachment: Letter dated January 30, 1985

UNITED STATES SUGAR CORPORATION
Post Office Drawer 1207 Clewiston, Florida 33440
Telephone: (813) 983-8121 Telex: 510-952-7753

Received 2/1/85 CHF

January 31, 1985

Mr. Clair Fancy
Department of Environmental Regulation
Montgomery Building
Koger Center
Tallahassee, Florida

RE: United States Sugar Corporation
Clewiston Boiler No. 4
Permit No. AC26-80930

Dear Mr. Fancy:

U. S. Sugar Corporation has reviewed the referenced final permit issued by the Department on January 11, 1985. While we appreciate that the permit conditions reflect a number of changes from the draft permit in response to our concerns, U. S. Sugar Corporation still has serious objections to certain provisions of the permit.

The two items of greatest concern are discussed below:

1. The imposition of a particulate emission limit to the third decimal place (in Specific Condition 10) which is far beyond the ± 15% margin of error that the Department has indicated is inherent to the testing methods. This margin of error could easily cause test results to be out of compliance for a boiler that is, in fact, comfortably within an applicable emission limit set to the second decimal place -- e.g., a 0.14 pound per million Btu actual emission rate could be indicated as 0.16 pounds per million Btu simply due to the 15% margin of testing error. It would require only an error of 0.6%, or 1/25 of this possible error to cause an actual 0.15 pound per million Btu emission rate to fall into noncompliance. We therefore consider the imposition of a particulate emission limit to the third decimal place to be both arbitrary and unreasonable, especially in view of the substantial economic penalties that could potentially be levied against our Company if testing errors show the boiler to be in violation when in fact no violation has actually occurred.

2. The imposition of steam production restrictions (Specific Condition 1) with no relationship to emissions. This condition ignores the fact that emissions from Boiler No. 4 could, under certain circumstances, be no greater at higher steam production rates. The Department's Final Determination indicated that the steam capacity limit was imposed for purposes of facilitating field inspection by the Department's personnel. We find this rationale to be insufficient to justify imposition of arbitrary steam production limits that may have costly consequences to U. S. Sugar Corporation in the future.

This action is particularly unreasonable in view of the Department's rejection of the alternative means of addressing valid regulatory concerns proposed in our attorney's letter of December 21, 1984.

Despite our serious objections to these provisions of the permit, U. S. Sugar Corporation finds that it has no alternative to accept the final permit as issued. We do so under duress, however, because of the urgent need to start up Boiler No. 4 before the current crop ends. U. S. Sugar Corporation nevertheless reserves the right to challenge, at a later date, by whatever legal means are available to it, those conditions of the permit that, as discussed above, are arbitrary and capricious.

It is also the intention of U. S. Sugar Corporation to seek a revision of the BACT particulate emission limitation for this boiler in the future in the event that consistent compliance with this limit cannot be achieved since it has not been demonstarated that the particulate control equipment approved by the Department as BACT for this installation is capable of meeting the BACT emission limit with full consistency on existing installations.

Sincerely,

UNITED STATES SUGAR CORPORATION

A. R. Mayo

A. R. Mayo
Vice President, Sugar Houses

ARM:jt

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
SUITE 420, LEWIS STATE BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

January 30, 1985

HAND DELIVERED THIS DATE

Mr. Clair Fancy
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: United States Sugar Corporation
Clewiston Boiler No. 4
Permit No. AC26-80930

Dear Clair:

As per our telephone conversation, the attached sheet indicates the three different steam conditions under which U.S. Sugar Corporation's Clewiston Boiler No. 4 will operate. Each steam condition (pressure, temperature) reflects the same heat input to the boiler (i.e., 545.5 mm Btu/hr). "Condition I" is the "design" condition, "Condition II" is the expected "normal" condition, and "Condition III" is the condition that will exist if the turbogenerator is off-line or if mechanical or other problems preclude high pressure steam production.

The restrictions on steam production in the final permit would unnecessarily restrict capacity at steam Condition II and III, even though the heat input (and, thus, emission rate) would not be higher at those lower pressure and temperature conditions. If steam production limits must be included in the permit, they should reflect all steam conditions, as follows:

	6-hr. avg.	Instantaneous
Condition I -	250,000 lb./hr	275,000 lb./hr
Condition II -	266,000 lb./hr	292,000 lb./hr
Condition III -	295,000 lb./hr	324,000 lb./hr

Please call me after you have had a chance to review this material.

Sincerely,

Peter

Peter C. Cunningham

PCC/gb

Enclosure

cc: Mr. Willard Hanks

Jan. 30, 1985

TO: Mr. Peter Cunningham

REFERENCE: Clewiston Sugar House
Boiler No. 4

Equivalent steam production at different steam conditions, based on same amount of BTU absorbed.

Permit condition - 250,000 PPH - 850 PSIG - 900° F

	CONDITION I 850 psig-900°F	CONDITION II 600 psig-750°F	CONDITION III 200 psig - 490°F
Equivalent Steam Flow	250,000 PPH	265,844 PPH	295,433 PPH
hg = BTU per Lb. Steam	1,453.06	1,378.88	1,261.65
hf = BTU per Lb. Boiler Feedwater	208.4	208.4	208.4
Net BTU Absorbed per LB. Steam	1,244.66	1,170.48	1,053.25
Net BTU Total in the Steam	311.1×10^6	311.1×10^6	311.1×10^6

A. R. Mayo

MP:jt

File Copy
S. Arsellwood
[handwritten initials]

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
SUITE 420, LEWIS STATE BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

CARLOS ALVAREZ
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ELIZABETH C. BOWMAN
RICHARD S. BRIGHTMAN
FRANK E. MATTHEWS
STEVEN A. MEDINA
CAROLYN S. RAEPPLE

OF COUNSEL
W. ROBERT FOKES

DER
JAN 15 1985
BAQM

January 11, 1985

RECEIVED
JAN 11 1985
Office of the Secretary

HAND DELIVERED THIS DATE

Victoria J. Tschinkel, Secretary
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: U.S. Sugar Corporation
Clewiston Sugar Mill Boiler No. 4
Request for Extension of Time for Filing on Permit No. AC26-80930

Dear Secretary Tschinkel:

On November 9, 1984, staff of the Department's Bureau of Air Quality Management provided to Ed Barber of the Florida Sugar Cane League, the Department's intent to issue Air Construction Permit No. AC 26-80930 for U. S. Sugar Corporation's Clewiston Sugar Mill Boiler No. 4, along with a draft permit, Technical Evaluation, and Preliminary Determination. Pursuant to your Order dated December 31, 1984, U.S. Sugar Corporation has until January 13, 1985 to file a petition for administrative proceedings in regard to this proposed agency action.

I am writing on behalf of U.S. Sugar Corporation to request an extension of nineteen (19) additional days, to and including February 1, 1985, for the filing of a petition for administrative proceedings on the Department's proposed agency action with respect to the air construction permit for Clewiston Boiler No. 4. This request is made pursuant to Florida Administrative Code Rule 17-103.070, which provides that a timely request for extension of time shall toll the running of the time period in which to file an appropriate petition. As good cause for granting this extension of time for filing, U.S. Sugar Corporation shows the following:

1. The draft permit issued by the Department contains twenty (20) specific conditions that are both extensive and technical. After its initial review of the draft permit, U.S. Sugar Corporation determined that certain of these

specific conditions are not entirely acceptable, and that other specific conditions would benefit from clarification.

2. Representatives of U.S. Sugar Corporation have met with Mr. Clair Fancy and other members of the Department's Central Air Permitting Section to discuss U.S. Sugar Corporation's concerns regarding the draft permit and potential revisions to certain of the draft permit conditions. A letter explaining each of U.S. Sugar Corporation's objections to the draft permit and recommending language changes was submitted to the Department on December 21, 1984.

3. Mr. Clair Fancy has advised me that the Department will be issuing the final air construction permit for Boiler No. 4 in the next few days. It is expected that the final permit conditions will reflect some, but not all, of the language changes requested by U.S. Sugar Corporation.

4. Because of Florida Administrative Code Rule 17-103.155(1)(b), an additional extension of time to file a petition on the Boiler No. 4 air permit is needed in order to preserve U.S. Sugar Corporation's right to initiate administrative proceedings on the permit, in the event that U.S. Sugar Corporation determines that the final permit language warrants such action. An extension of time until February 1, 1985 will give U.S. Sugar Corporation approximately two weeks from the anticipated receipt of the final permit.

5. A second waiver of the ninety-day permit limit under Sections 120.60(2) and 403.0876, Florida Statutes for the Boiler No. 4 air construction permit is attached as Exhibit "A" hereto. (DER Form 17-1.201(8))

I hereby certify that I have spoken with Carol Forthman, Assistant General Counsel for the Department, and with Clair Fancy, Deputy Chief of the Bureau of Air Quality Management, and that both are in agreement with the grant of this request.

Accordingly, I respectfully request that you formally extend the time for filing a petition for administrative proceedings regarding the Department's Intent to Issue Air Construction Permit No. AC26-80930 for U.S. Sugar Corporation Clewiston Boiler No. 4 to and including February 1, 1985.

Sincerely,

Peter C. Cunningham

PCC/gs
Attachment

cc: Carol Forthman, Esquire
Clair Fancy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, Certification) Application No. AC26-80930

Applicant's Name: A.R. Mayo, Vice President
U.S. Sugar Corporation

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, certification) application, the applicant hereby with full knowledge and understanding of (his) (her) (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, is in (his) (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 18th day of January 1985.

The undersigned is authorized to make this waiver on behalf of the applicant.

Peter C. Cunningham
Signature

Peter C. Cunningham
Please Type Name of Signee

January 11, 1985
Date

Sworn to and subscribed before me this 11th day of January 1985.

Notary Public
My Commission Expires:

Notary Public, State of Florida
My Commission Expires March 6, 1988
Bonded Thru Troy Fain Insurance, Inc.

DER Form 17-1.201(8)
Effective November 30, 1982

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

January 11, 1985

Mr. A. R. Mayo, Vice President
U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

Enclosed is construction permit No. AC 26-80930, dated January 11, 1985, to U.S. Sugar Corporation for Boiler No. 4 issued pursuant to Section 403, Florida Statutes.

In preparing our final determination on your application, we carefully reviewed your attorney's comments on the proposed specific conditions and revised those we felt were appropriate. However, we were unable to compromise on the intent of Specific Condition No. 20 which listed the actions to be taken should the proposed system not comply with the emission standards. Even though we have chosen to delete this condition, we will be forced to take enforcement action, in coordination with the Environmental Protection Agency, to bring this source into compliance with the state and federal regulations if it does not meet the emission standards contained within this permit.

Acceptance of the permit constitutes notice and agreement that the Department will periodically review this permit for compliance, including site inspections, and as mentioned in the preceeding paragraph, may initiate enforcement actions for violation of the conditions and requirements thereof.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/WH/s

cc: David Buff
David Knowles
Peter Cunningham
James Wilburn

Final Determination

United States Sugar Corporation
Clewiston, Florida
Hendry County

Boiler Number 4
Permit Number AC 26-80930

Florida Department of Environmental Regulation
Bureau of Air Quality Management
Central Air Permitting

January 11, 1985

Final Determination
United States Sugar Corporation
AC 26-80930

The Technical Evaluation and Preliminary Determination for the proposed 545.5 million Btu/hr bagasse/No. 6 residual oil fired Boiler No. 4 at U. S. Sugar Corporation's Clewiston Mill was distributed on November 9, 1984. The Notice of Proposed Agency Action on the Permit Application was published in The Clewiston News on November 14, 1984. Following a meeting with the attorney and professional engineer representing the Company, the Bureau received a letter dated December 19, 1984, requesting changes to the requirements listed as specific conditions in the draft permit. The Bureau also received a letter from the United States Environmental Protection Agency on December 19, 1984, that commented on a specific condition in the proposed permit. No other comments were received. Day ninety, after which the permit would be issued by default, is January 14, 1985. Our response to each of the comments is discussed below.

Hopping, Boyd, Green, & Sams Letter dated December 19, 1984

Specific Condition No. 1

The Bureau placed a limit on the steam production for the new boiler based on data supplied by the applicant.

The Company objected to this limit because short term fluctuations of steam production could exceed the limit listed in the application. They claimed that both the boiler and the scrubber had a significant design capacity margin and thus, higher production could be achieved without the particulate matter ambient air quality standard being violated. They requested the steam production capacity be limited by the particulate matter emissions only.

After considering their request, the Bureau concluded that some relief was justified to address the short term fluctuations in steam production. We chose not to eliminate the limit on steam production because of the complexity it would cause our field personnel in determining the compliance status of this boiler. If the Company desires a higher allowable steam production rate than originally requested, they must submit a new application for a permit to construct with supporting data to show that system will comply with the Department's air pollution control regulations at a higher steam production rate.

Specific condition No. 1 is revised in the final determination to allow for short-term fluctuations in steam production.

Specific Condition No. 2

The Bureau limited the number of oil guns that could be installed in the boiler to that which would allow 225 million Btu per hour heat input from fuel oil as a higher heat input could subject the boiler to additional regulations.

The Company noted we had misstated the number of guns that could be used in the boiler without exceeding the proposed heat input.

The Bureau is in agreement with the Company's comments and has reworded this specific condition in the final determination.

Specific Condition No. 6

The Bureau required all oil meters at the plant be read every 3 hours and that these records be kept for five years.

The applicant requested the use of a continuous recorder in lieu of three hour readings and that the records be kept for two years.

The Bureau will accept a continuous recorder reading for the three hour oil meter readings and has reworded the specific condition to allow this.

We have chosen not to change the requirement that the oil records be maintained for five years. The Florida Administrative Code does not place a time limit that can be required by the Department for retention of records. The Bureau feels that five years of data is needed in this particular situation to provide extensive technical data on this control device used by this industry. This will allow for a comprehensive technical review of the control device performance each time the permit to operate is renewed.

Specific Condition No. 6 is partially revised to reflect the option of the continuous recorder.

Specific Condition No. 7

The Bureau limited the heat input to the boiler based on the values submitted in the application.

The applicant objected to both steam production (Specific Condition No. 1) and heat input being limited, primarily because heat input could not be measured directly, and requested this specific condition be eliminated. They added that if there was a heat input limit, it should specify an averaging time.

The Bureau believes that this limit on heat input, with an averaging time consistent with steam production as requested by the applicant, should be retained in the permit for this boiler. As steam production, heat input, and material balance data furnished in the application are related, the imposition of both a steam production and heat input is not inconsistent and may allow for alternate methods to measure this system's performance in the future.

The Bureau revised this specific condition to be consistent with Specific Condition No. 1.

Specific Condition No. 8

The Bureau is requiring a thermal efficiency test prior to the expiration of the construction permit and each time the permit to operate is renewed (once every five years).

The applicant has requested that the thermal efficiency be determined by the short-form ASME test, that the permit to construct be extended to allow time for this test, and that the requirement to repeat the thermal efficiency test before the permit to operate is renewed be deleted from the construction permit.

The Bureau finds the short-form ASME test acceptable and will adjust the expiration date of the construction permit to allow the applicant to conduct this test. However, to obtain a data base on this system, we need the thermal efficieny test conducted each time the permit to operate is renewed and have not deleted this requirement from the construction permit.

Specific Condition Nos. 8 and 18 are modified to incorporate the changes discussed above.

Specific Condition No. 9

The Bureau referenced the specifications that the proposed scrubber was to meet, required continuous monitoring of the scrubber operating parameters, and required these records be kept for five years.

The applicant objected to continuously monitoring of some of the scrubber parameters and offered to keep an hourly log of the values instead. The applicant again objected to keeping records for five years.

The Bureau is willing to accept hourly reading during normal operations of this scrubber initially. We will need more frequent readings, once every 15 minutes for each parameter, during the compliance test. After the Bureau reviews the emission data and scrubber parameters, we will establish a frequency for recording the scrubber parameters, which can vary from continuously to none at all, and which will become a requirement in the permit to operate that is issued for Boiler No. 4. This information is needed to accumulate a data base as mentioned in the discussion of Specific Condition No. 6.

Specific Condition No. 9 is modified as discussed above.

Specific Condition No. 10

In this condition, the Bureau specified a particulate matter emission standard of 0.150 lb/MMBtu for bagasse fuel and 0.10 lb/MMBtu for oil fuel; set the test methods to be used to determine the compliance status; required the use of the measured boiler efficiency to determine heat input; required alternate calculations of emissions by the F factor for information purposes only; and set the conditions (permitted boiler capacity) at which the compliance test would be conducted.

The applicant objected to a standard to three decimal places, to the use of measured boiler efficiency in the emission calculations, and to limiting the boiler production capacity during this test.

The applicant noted that in the past they had rounded off the results to two decimal places and this had been accepted by the Department. In their opinion, 0.1549 met the 0.15 standard. They noted that all emission calculations in the past have been based on the assumption that the boilers have a thermal efficiency of 55 percent when burning bagasse. The material and energy balances in the application were based on this assumed efficiency. They referred to their objections to Specific Condition No. 1 on the limit to steam production implicated in the test conditions for this boiler.

In the Best Available Control Technology determination the Bureau deliberately set the emission standard to three decimal places. Our intent is that any emissions above 0.150 lb/MMBtu (i.e., 0.151) is a violation of the standard. The historical practices referred to by the applicant do not reflect the BACT determation made in late 1984. These determinations are made on a case by case basis.

If heat input to the boiler is determined by steam production, the actual thermal efficiency must be known. If an assumed thermal efficiency is used in the calculations, the calculated heat input may be biased. The industry has reported thermal efficiencies of bagasse boilers in excess of 60 percent. If the assumed thermal efficiency is used and the boiler's actual thermal efficiency is above 60 percent, then the boiler is being allowed emission in excess of 1.6 lb/MMBtu (actual). The Bureau will continue to allow the use of an assumed thermal efficiency of 55 percent in determining the compliance status of this source as all material and energy balances in the application were based on the assumed efficiency. We have no intention of allowing the compounding of the third decimal point and the likely advantage of the assumed boiler efficiency to allow a much higher allowable emission than is set forth in the BACT.

As discussed in our comments on Specific Condition No. 1, the Bureau has decided to retain the steam production limit (with some adjustment) on this boiler and has referenced this limit in the conditions established for the compliance test.

Specific Condition No. 10 is revised as discussed above.

Specific Condition No. 11

In this condition, the Bureau required the applicant to always determine the particulate matter and visible emissions concurrently.

The applicant noted that there may be conditions beyond their control that would prevent the two tests from being conducted concurrently and requested some relief under these situations.

The Bureau agrees that some flexibility in this testing requirement is justified and has reworded Specific Condition 11 accordingly. We do intend for them to be done concurrently most of the time.

Specific Condition No. 12

This condition restricted the sulfur content in the fuel oil used in the boiler and required the records on oil consumed be kept for five years.

The applicant requested that the condition be reworded in a way that would allow a higher sulfur content of oil to be burned in the boiler and that the retention of the records be reduced to two years.

The Bureau has reworded these conditions to be specific on the amount of sulfur allowed in the fuel oil. We also retained the requirement for five years of records as discussed earlier.

Specific Condition No. 13

This condition specified the standard, test methods, and test conditions for sulfur dioxide emissions from Boiler No. 4. It is very similar to Specific Condition No. 10 which addressed particulate matter emissions.

The Company's objections are similar to the ones for Specific Condition No. 10.

The Bureau's position on the Company's comments are similar to those expressed in the discussion of Specific Condition No. 10, and Specific Condition No. 13 has been revised accordingly.

Specific Condition No. 14

The Bureau restricted the volatile organic compounds (VOC) emission to that proposed by the applicant or to whatever the actual emissions were, if lower that the proposed rate.

The applicant objected to being restricted to the actual emissions from the facility instead of the limit proposed which was based on VOC emissions from burning bark.

As the VOC emissions proposed by the applicant will not cause environmental damage, the Bureau will remove the reference to actual VOC emissions from this specific condition.

Specific Condition No. 17

The Bureau placed this condition in the permit to make mandatory several proposed plans for reducing emissions from existing equipment at the plant and consequently improve the ambient air quality in the vicinity of the plant.

The applicant has requested that the proposed restriction be relaxed.

As the Bureau has no specific regulations requiring the applicant to lower the emissions from these existing sources, we have revised this specific condition to give the flexibility requested by the applicant.

Specific Condition No. 18

This condition sets the schedule for submitting a complete permit to operate Boiler No. 4.

The applicant requested more time to complete construction, debugging, testing, and applying for a permit to operate. They also requested that the construction permit expiration date be extended to one year after its issuance.

Because of the delays in obtaining information needed to issue the construction permit, the Bureau will adjust the schedule to allow more time for the applicant to build, debug, and test Boiler No. 4. However we still cannot allow commercial operation of boiler No. 4 until a complete application for permit to operate is submitted to the South Florida District office as required in this specific condition.

Specific Condition No. 18 and the expiration date of the construction permit are adjusted accordingly.

Specific Condition No. 19

This condition listed the operating and reporting conditions to be included in the permit to operate Boiler No. 4.

The applicant felt these conditions should be addressed in the permit to operate and objected to the Bureau requiring the Company to operate the scrubber at the pressure drop recorded during the compliance test.

The Bureau routinely specifies minimum reporting requirements in any permit to construct processed by Central Air Permitting. By doing so, a legal basis is established to obtain the minimum data the Bureau believes is needed to monitor an operation. As for the pressure drop that the scrubber is to be operated at after the compliance test, we have reworded this condition to allow some flexibility to account for short term fluctuations in the operation of the scrubber.

Specific Condition No. 19 has been revised as discussed above.

Specific Condition No. 20

This condition describes the action to be taken by the applicant if this source fails to comply with the permitted emission standards. This unusual condition was added because of the Bureau's concern as to whether this source can meet the emission standard on a continuing basis.

The applicant objected to such a condition in a construction permit and noted that the Department has a full range of enforcement options should the boiler fail to comply. Alternate language was offered for this condition including the suggestion that the Department revise the emission standard if their system is unable to meet the BACT.

After reconsidering this condition the Bureau has decided to delete it. In the event the applicant does not comply with the permit the Department will use its full range of enforcement actions, in coordination with the U.S. Environmental Protection Agency, to bring this boiler into compliance with all air pollution control regulations.

Response to EPA Comment:

EPA commented that specific condition No. 13 of the proposed permit would allow the SO_2 3-hour and 24-hour increments to be violated. Their comment also stated that an emission rate of 680 pounds per hour of SO_2, as permitted in condition No. 13, is approximately five times the emission rate used in the increment analysis. We believe EPA intended to refer to condition No. 12 (relating to fuel oil burning), not condition No. 13 (related to bagasse burning). In addition, condition No. 12 does not permit 680 pounds per hour of SO_2 to be emitted, but, in combination with conditions Nos. 3, 4, and 5, would allow no more than 643 pounds per hour of emission.

The emission rate used in the increment analysis is 643 pounds per hour. This value represents the emission rate from maximum fuel oil burning in Boiler No. 4 using 2.5% sulfur oil. The predicted 24-hour SO_2 concentration due to this rate is 52 ug/m^3 or 57% of the Class II increment. The predicted 3-hour SO_2 concentration is 161 ug/m^3 or 31% of the Class II increment. We discussed the 24-hour SO_2 impact in Appendix A, Section C, of the preliminary determination and we displayed the 24-hour and 3-hour values discussed above in Table III of Appendix A. In Table II of Appendix A we noted that the absolute worst case SO_2 emission rate for boiler No. 4 was 81.0 grams per second (or 643 pounds per hour). As part of the final determination, we will add a note to Table III stating that the SO_2 3-hour and 24-hour increment concentrations are based on the absolute worst case fuel use of 643 pounds per hour, and we will attach the computer printouts submitted by U.S. Sugar which show the input value of 81 grams per second (643 pounds per hour) and the concentrations shown in Table III. Actually, the Class II increment consumption will be less than the values in Table III since the department is requiring in Condition 12 that fuel oil burned in Boiler No. 4 must be replaced by fuel oil containing no more than 1.5% sulfur instead of the 2.5% U.S. Sugar requested.

Miscellaneous

Several errors were also noted in the Preliminary Determination. They were:

1. The stack height for the existing boilers is up to 90 feet high instead of 75 feet.

2. Emissions were limited by the ambient air quality standards, not the PSD increments.

3. The net emissions increase of NO_x is 203 TPY instead of the 238 TPY stated.

4. We neglected to require CO test annually if visible emissions exceed 20 percent opacity.

None of these errors affect the conclusions reached in reviewing this application.

CORRECTED TABLE III

COMPARISON OF NEW SOURCE IMPACTS
WITH PSD INCREMENTS

Pollutant and Time Average	PSD Class II Increment	Predicted Concentration	Percent Increment Consumed
SO_2 (ug/m^3)			
3-hour	512	161[1]	31[1]
24-hour	91	52[1]	57[1]
Annual	20	3	15
PM (ug/m^3)			
24-hour	37	6	16
Annual	19	0.3	2

[1] Absoulute worst-case for Boiler No. 4 is 81.0 g/s when maximum fuel oil burned. This can occur less than 14 days per cane season.

*** U.S. SUGAR - CLEWISTON 1970-1974 - - SO2 FUEL OIL MAX - BOILER 4 ONLY ***

SOURCE # 4---BOILER 4 NEW

*** SOURCE DATA ***

SOURCE NUMBER	TYPE	WAKE	NUMBER PART. CATS.	EMISSION RATE TYPE=0,1 (G/S) TYPE=2 (G/S) *PER M**2	X (M)	Y (M)	BASE ELEV. (M)	HEIGHT (M)	TEMP. TYPE=0 (DEG.K) VERT.DIM. TYPE=1 (M)	EXIT VEL. TYPE=0 (M/S) HORZ.DIM. TYPE=1,2 (M)	DIAM. TYPE=0 (M)	BLDG. HEIGHT TYPE=0 (M)	BLDG. LENGTH TYPE=0 (M)	BLDG. WIDTH TYPE=0 (M)
4	0	0	0	81.0 643	0.	0.	0.0	45.72	340.0	18.94	2.21	0.0	0.0	0.0

Boiler w/ max oil and bagasse

*** U.S. SUGAR - CLEWISTON 1970-1974 - - SO2 FUEL OIL MAX - BOILER 4 ONLY ***

COMPOSITE SECOND-HIGHEST 24-HOUR CONCENTRATION TABLE, UG/CU.M, FOR SOURCE GROUP 1

* FOR THE RECEPTOR GRID *

DIRECTION / (DEGREES) /	RANGE (METERS) 300.0	600.0	900.0	1200.0	1500.0	1800.0
360.0 /	0.4	11.7	16.9	22.5	27.1	27.1
350.0 /	0.6	11.7	15.5	22.5	24.0	23.6
340.0 /	0.8	11.2	22.8	30.3	32.6	31.7
330.0 /	0.9	12.5	18.7	25.8	28.1	27.6
320.0 /	0.8	15.8	29.3	36.7	38.8	38.0
310.0 /	1.4	21.6	31.3	37.5	42.6	43.1
300.0 /	0.6	19.2	34.4	34.6	39.0	40.2
290.0 /	0.7	15.6	26.8	32.5	42.4	48.1
280.0 /	0.5	20.7	31.4	31.6	29.9	30.9
270.0 /	0.6	14.3	28.5	42.7	50.9	50.6
260.0 /	1.0	19.5	33.6	47.2	50.6	49.6
250.0 /	1.2	18.0	28.6	44.2	49.1	48.5
240.0 /	0.6	15.8	34.3	43.3	45.6	45.0
230.0 /	0.4	13.1	27.1	36.9	41.8	42.3
220.0 /	0.3	14.1	29.8	43.2	46.1	44.8
210.0 /	0.7	11.6	16.0	24.6	26.0	25.6
200.0 /	0.2	9.0	16.1	18.6	20.2	19.9
190.0 /	0.2	8.0	11.5	15.2	16.4	16.1
180.0 /	0.3	10.1	15.8	20.2	21.8	19.9
170.0 /	0.3	11.1	19.4	20.0	21.4	20.8
160.0 /	0.5	14.7	21.0	19.5	22.3	23.7
150.0 /	0.3	11.8	20.1	20.9	20.2	20.0
140.0 /	0.5	12.5	27.8	31.7	30.9	29.2
130.0 /	0.5	15.4	26.9	29.4	33.1	35.3
120.0 /	0.6	14.2	19.6	23.9	28.4	29.6
110.0 /	0.4	13.0	20.7	25.7	28.0	28.3
100.0 /	0.5	11.8	16.6	22.6	24.0	23.6
90.0 /	0.3	8.0	13.6	17.0	18.1	19.1
80.0 /	0.2	11.7	18.8	19.5	18.7	19.1
70.0 /	0.3	10.7	21.6	23.0	20.9	21.8
60.0 /	0.8	14.6	21.2	23.5	24.1	22.8
50.0 /	0.5	16.7	17.9	20.0	20.7	19.9
40.0 /	0.3	10.3	18.3	21.2	22.3	20.9
30.0 /	0.6	10.8	17.5	17.2	15.2	14.6
20.0 /	0.5	9.0	14.0	13.4	15.6	15.8
10.0 /	0.4	8.1	[illegible]	[illegible]	[illegible]	[illegible]

*** U.S. SUGAR - CLEVISTON 1970-1974 - - SO2 FUEL OIL MAX - BOILER 4 ONLY ***

COMPOSITE SECOND-HIGHEST 3-HOUR CONCENTRATION TABLE, UG/CU.M, FOR SOURCE GROUP 1

* FOR THE RECEPTOR GRID *

DIRECTION / (DEGREES) /	RANGE (METERS) 300.0	600.0	900.0	1200.0	1500.0	1800.0
360.0 /	3.3	91.5	134.5	132.9	105.7	109.9
350.0 /	4.5	76.6	90.3	84.8	83.0	87.5
340.0 /	6.1	72.6	77.1	104.9	108.4	111.1
330.0 /	6.3	85.5	117.6	104.2	108.7	106.1
320.0 /	5.1	91.3	139.8	145.7	132.3	116.1
310.0 /	5.8	101.4	128.7	130.1	112.3	113.9
300.0 /	4.8	99.4	147.1	134.8	111.4	113.7
290.0 /	5.3	93.6	135.1	125.9	113.2	111.5
280.0 /	5.3	101.1	160.6	138.7	114.7	103.3
270.0 /	4.4	86.6	131.4	127.0	116.8	116.4
260.0 /	6.7	108.9	127.0	126.1	123.7	120.6
250.0 /	5.9	106.9	138.8	134.7	117.4	115.3
240.0 /	6.1	72.5	122.6	119.8	108.0	114.7
230.0 /	2.8	72.2	119.6	109.3	110.6	111.7
220.0 /	1.8	69.1	109.8	101.0	104.4	105.8
210.0 /	3.1	55.7	85.6	87.2	83.0	75.8
200.0 /	1.6	48.5	84.7	85.4	82.6	77.2
190.0 /	1.8	63.9	72.5	81.7	73.8	77.5
180.0 /	2.6	67.4	95.4	120.6	107.6	101.6
170.0 /	2.2	71.2	126.0	131.8	120.0	102.6
160.0 /	3.6	105.7	138.2	116.6	95.1	94.8
150.0 /	3.6	82.8	121.8	118.7	93.9	88.0
140.0 /	5.3	81.0	145.9	150.4	130.6	108.5
130.0 /	3.6	112.1	121.1	135.9	114.6	100.6
120.0 /	3.7	113.3	122.4	113.3	97.3	97.2
110.0 /	3.5	103.1	138.1	122.5	115.1	101.5
100.0 /	3.5	88.7	95.0	86.4	83.2	84.1
90.0 /	2.1	63.1	87.2	90.1	85.9	81.1
80.0 /	1.4	85.8	119.6	110.7	97.4	81.8
70.0 /	2.3	71.7	98.7	105.0	104.0	94.1
60.0 /	5.7	83.8	110.4	117.1	108.5	93.1
50.0 /	3.9	69.0	101.8	103.4	95.4	84.7
40.0 /	2.4	66.7	129.9	129.3	114.2	108.9
30.0 /	4.4	63.8	90.1	97.9	87.9	83.2
20.0 /	3.7	72.2	77.6	78.9	79.7	71.0
10.0 /	3.2	64.8	72.7	89.7	90.0	80.3

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PERMITTEE:
U.S Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Permit Number: AC 26-80930
Expiration Date: January 11, 1986
County: Hendry
Latitude/Longitude: 26° 44' 30"N/ 80° 56' 15"W
Project: Boiler No. 4

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2, 17-4 and 40 CFR 52.21. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

Installation of a used 545.5 million BTU/hr heat input (250,000 lb/hr steam) Foster Wheeler boiler modified to burn bagasse and/or No. 6 residual oil along with a Joy Manufacturing Company designed Turbulaire spray Impingement Scrubber. The modified boiler will be installed at U.S. Sugar Corporation's existing sugar mill that is located near the intersection of W. C. Owens Avenue and Clewiston Street in Clewiston, Hendry County, Florida. The UTM coordinates of this site are 17-506.1 Km E and 2956.9 Km N.

Construction shall be in accordance with the 1 application for a permit to construct a Bagasse/Oil-Fired Boiler that was signed by Mr. A. R. Mayo on February 1, 1984, and the additional information submitted by Hopping Boyd Green and Sams on 2 June 1, 1984, and 3 September 24, 1984, and Mr. A. R. Mayo on 4 July 30, 1984, and 5 September 19, 1984, except for the changes mentioned in the Technical Evaluation and Preliminary Determination and listed as specific conditions in the construction permit.

PERMITTEE:
U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Permit Number: AC 26-80930
Expiration Date: January 11, 1986

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by an order from the department.

PERMITTEE:
U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Permit Number: AC 26-80930
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GENERAL CONDITIONS:

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

a. Having access to and copying any records that must be kept under the conditions of the permit;

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

PERMITTEE:
U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Permit Number: AC 26-80930
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GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

(X) Determination of Best Available Control Technology (BACT)
(X) Determination of Prevention of Significant Deterioration (PSD)
( ) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

PERMITTEE:
U.S. Sugar Corporation
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GENERAL CONDITIONS:

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. Steam production shall not exceed an average of 250,000 pounds per hour during any consecutive six hour period; or an instantaneous rate of 275,000 pounds per hour. The boiler shall be equipped with an instrument to continuously record steam production.

2. Heat input from No. 6 residual oil shall not exceeded 225 million Btu per hour which is approximately equivalent to 1,500 gallons per hr ~~minute~~ of oil and 150,000 pounds per hour of steam. The boiler shall be built so that not more than two burners with two oil guns each (total of four oil guns) can be installed with a total maximum capacity not to exceed the permitted oil input.

PERMITTEE:
U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Permit Number: AC 26-80930
Expiration Date: January 11, 1986

SPECIFIC CONDITIONS:

3. During any 12 month period, the maximum quantity of No. 6 residual oil burned in boiler No. 4 shall not exceed 500,000 gallons.

4. During any 24 hour period, not more than 40,800 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. All permits to operate other oil burning equipment at this plant shall be revised to include this limitation prior to the issuance of a permit to operate boiler No. 4.

5. During any 3 hour period, not more than 6,300 gallons of fuel oil shall be burned in all stationary fuel oil burning equipment at the plant. All permits to operate other oil burning equipment at this plant shall be revised to include this limitation prior to the issuance of a permit to operate boiler No. 4.

6. All stationary fuel oil burning equipment at the plant shall be equipped with integrating fuel oil flow meters or continuous recorders to measure the amount of fuel oil consumed by the equipment. Oil meter readings on all oil consuming equipment shall be read and logged at least once every three hours unless oil consumption for the equipment is recorded continously, and these records shall be kept for at least five years for department inspection. Each meter shall be calibrated annually by a method approved by the department.

7. Heat input to Boiler No. 4 from bagasse fuel or a combination of bagasse/oil fuels shall not exceed 545.5 million Btu per hour, six hour average, or an instantaneous rate of 600 million Btu per hour.

8. Prior to the expiration of this construction permit, a test shall be made on Boiler No. 4 to determine its actual thermal efficiency in accordance with the ASME short-form procedure. This must be repeated each time the operating permit for this boiler is renewed. The test shall be done while the tubes are clean and within 14 days of the compliance test. A current report on the thermal efficiency test must be included with the application to operate this boiler.

PERMITTEE:
U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Permit Number: AC 26-80930
Expiration Date: January 11, 1986

SPECIFIC CONDITIONS:

9. The scrubber controlling the emissions from Boiler No. 4 shall be built to Joy Manufacturing Company's specifications for their Turbulaire, Type D, Size 200 spray impingement scrubber and shall be equipped with instruments to measure the gas pressure drop and pH of the scrubber water. Instruments to continuously record the scrubber water pressure and volumetric flow shall also be provided. During the first season of operation, hourly readings of the gas pressure drop shall be taken and logged for each day that Boiler No. 4 operates. The hourly data shall be converted into consecutive three hour averages. If any three hour average gas pressure drop falls more than ten percent below the average pressure drop recorded during the compliance test that showed compliance with the particulate matter standard, or any one hour reading is twenty-five percent below the average pressure drop recorded during the compliance test, the department will require a compliance test at the lower pressure drop and may also require the installation of an instrument to continuously measure and record the gas pressure drop.

Hourly readings of the pH of the scrubber water shall be taken and logged for each hour during which bagasse is burned in Boiler No. 4 during its first 182 days of operation. The hourly data shall be converted into consecutive three hour averages. The department will be notified if chemicals are used to adjust pH. If any three hour average pH value falls more than ten percent below the pH that existed during the compliance test for sulfur dioxide, the department may require the installation of an instrument to continuously measure and record scrubber water pH.

During compliance testing, the scrubber parameters shall be measured and recorded at 15 minute intervals.

Records of the measurements required by this condition shall be obtained each day Boiler No. 4 operates during the first 182 days and copies of the records transmitted to the South Florida District and Bureau of Air Quality Management at the end of the season(s).

After review of the first 182 days of data, the Bureau of Air Quality Management and the South Florida District will establish the scrubber parameters to be monitored and the frequency of monitoring. These requirements shall become a condition to any permit to operate issued to Boiler No. 4. The records required by the permit to operate shall be kept for five years for agency inspection.

PERMITTEE:
U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Permit Number: AC 26-80930
Expiration Date: January 11, 1986

SPECIFIC CONDITIONS:

10. Particulate matter emissions from boiler No. 4 shall not exceed 0.150 lb/million Btu heat input for bagasse fuel or 0.10 lb/million Btu heat input for No. 6 residual oil fuel. In event that both fuels are burned concurrently, the allowable particulate matter emissions shall be prorated from the allowable standards for each fuel by their respective heat inputs. Compliance with the particulate matter standards shall be determined by EPA Reference Methods 1, 2, 3, 4, and 5 as described in 40 CFR 60, Appendix A. The compliance test results shall be calculated by assuming the thermal efficiency of boiler No. 4 is 55 percent, or any new method subsequently adopted by department rule. For informational purposes only, the particulate matter emission rate shall also be calculated by utilizing both the F factor (for each compliance test) and the short term ASME boiler efficiency test results (once every five years). Scrubber parameters listed in Specific Condition No. 9 shall be recorded every 15 minutes or continuously during the compliance test.

All compliance tests shall be conducted while the boiler is operating within 10 percent of its maximum or permitted capacity, whichever is lower. The South Florida District office shall be notified 15 days prior to any compliance test.

11. Visible emissions from Boiler No. 4 shall not exceed 20 percent opacity except that 40 percent opacity is allowed for 2 minutes during any hour. Compliance with the standard shall be determined by DER Method 9 as described in Chapter 17-2, FAC. The particulate matter emissions and visible emissions shall be determined concurrently. Under circumstances when this is not feasible, the Company shall obtain prior approval from the South Florida District to conduct the tests at separate times. In such circumstances, the tests shall be conducted as close to each other as is feasible.

12. Any No. 6 residual fuel oil burned in this boiler shall contain no more than 2.50 percent sulfur and shall be replaced during the season in which it is burned with fuel oil containing no more than 1.50 percent sulfur. Compliance with this condition shall be determined from certified analysis of the replacement oil by ASTM Method D-129. Records of the quantity and analysis of fuel oil consumed in the No. 4 boiler and invoices for the oil purchased shall be kept for a minimum of five years for regulatory agency inspection.

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U.S. Sugar Corporation
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Clewiston, Florida 33440

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SPECIFIC CONDITIONS:

13. Sulfur dioxide emissions from boiler No. 4, while it is burning 100 percent bagasse fuel, shall not exceed 0.25 lb/million Btu heat input as determined by EPA Method 6 as described in 40 CFR 60, Appendix A. The compliance test results shall be calculated by assuming the thermal efficiency of Boiler No. 4 is 55 percent, or any new method subsequently adopted by department rule. For informational purposes only, the sulfur dioxide emission rate shall also be calculated by utilizing both the F factaor (for each compliance test) and the short term ASME boiler efficiency test results (once every five years). Scrubber parameters listed in Specific Condition No. 9 shall be recorded every 15 minutes or continuously during the compliance test.

All compliance tests shall be conducted while the boiler is operating within 10 percent of its maximum or permitted capacity, whichever is lower. The South Florida District Office shall be notified 15 days prior to any compliance test.

Sulfur dioxide emissions from Boiler No. 4, while it is burning a mixture of oil and bagasse, shall not exceed 680 lb/hr.

14. Emissions of carbon monoxide and volatile organic compounds shall be maintained at the lowest possible level through the implementation of an Operation and Maintenance plan that is approved by the department. Emissions of carbon monoxide shall not exceed 0.25 lb/million Btu as determined by EPA Method 10. Emissions of volatile organic compounds shall not exceed 1.7 lb/ton of wet bagasse as determined by EPA Method 25. These test methods are described in 40 CFR 60, Appendix A. After the initial compliance tests, compliance tests for these pollutants will not be required if the visible emissions from Boiler No. 4 are below 20 percent opacity and the initial VOC Method 25 tests and initial CO method 10 tests show compliance.

15. Visible emissions from the bagasse handling systems shall not exceed 10 percent opacity over any 6 minute period as measured by DER Method 9. Water spray or other effective means will be used to minimize fugitive emissions when reclaiming dry bagasse for the boiler.

16. Nitrogen oxides emissions, expressed as NO_2, shall not exceed 136.8 lb/hr as determined by EPA Reference Method 7 described in 40 CFR 60, Appendix A. After the initial compliance test, the Company may substitute an Operation and Maintenance plan that is approved by the department that optimized the NO_x emissions for the compliance tests specificed in this specific condition if the initial Method 7 test show compliance.

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U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

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SPECIFIC CONDITIONS:

17. The pellet mills at this plant shall be permanently shut down, made inoperative by disconnecting the electrical power or by other means as approved by the department, and the permits to operate surrendered to the South Florida District office prior to commercial operation of Boiler No. 4. Prior to issuance of an operating permit for Boiler No. 4, the permits to operate boilers Nos. 5 and 6 shall be revised to provide that those boilers shall not be operated during any season until particulate matter emission test reports on Boilers Nos. 1 and 2 for that season have been received by South Florida District office and show particulate matter emissions from Boilers Nos. 1 and 2 do not exceed 0.25 lb/million Btu heat input.

18. The applicant will demonstrate compliance with the conditions of the construction permit and submit a complete application for a permit to operate to the South Florida District Office 90 days prior to the January 11, 1986, expiration date of this construction permit or 60 days after initial start-up of Boiler No. 4, whichever date occurs first. The applicant may continue to operate in compliance with all terms of this construction permit until its expiration date.

19. Any permit to operate issued for Boiler No. 4 will limit operation to 182 days per season; require the scrubber to be operated at a six hour average pressure drop not less than 90 percent of the six hour average pressure drop that existed during the particulate matter test that showed compliance or not less than 75 percent of the average six hour pressure drop at any time; require, as a minimum, annual particulate matter and visible emission tests; an annual operation report which will include the amount of oil burned at the plant to determine compliance with the limits on oil usage in this permit, and the sulfur content of the residual oil purchased for the season; and a monthly summary of the scrubber parameters listed in Specific Condition No. 9.

PERMITTEE:
U.S. Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Permit Number AC 26-80930
Expiration Date: January 11, 1986

SPECIFIC CONDITIONS:

Issued this 11th day of Jan, 1985

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

for VICTORIA J. TSCHINKEL, Secretary

____ pages attached.

Best Available Control Technology (BACT) Determination
U.S. Sugar Corporation
Hendry County

The applicant plans to install a 545.5 million Btu per hour heat input bagasse-fired steam generator. The unit will be capable of firing No. 6 residual oil to be limited to a heat input of 225 million Btu per hour, since bagasse will be the primary fuel. The unit will be operated during the sugar cane season which is October 15 through April 15. The source designated identification will be Boiler No. 4.

Boiler No. 4-applicant's summary of air pollutant emissions is as follows:

Pollutant	Emissions Tons/Year	Significant Rate
Particulates	238	25
SO_2	382	40
NO_x	206	40
CO	298	100
Ozone (VOC)	281	40

Rule 17-2.500 (5) requires a Best Available Control Technology (BACT) review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in Table 500-2, Regulated Air Pollutants-Significant Emission Rates. The effected pollutants in this case are particulates, ozone (VOC), sulfur dioxide, nitrogen oxides and carbon monoxide. The source is to be located in an area classified as attainment for all regulated air pollutants.

BACT Determination Requested by the Applicant

Pollutant	Emission Limit
Particulate (Bagasse)	0.20 lb/million Btu, heat input,
(oil)	0.10 lb/million Btu heat input
SO_2 (Bagasse)	0.25 lb/million Btu, heat input
(oil)	2.5% sulfur content oil and annual consumption not to exceed 500,000 gallons

NO_x	136.8 lb/hr
CO	136.4 lb/hr

A Spray impingement scrubber similar in design to a Joy type D, size 200, "Turbulaire" spray impingement scrubber will be constructed and installed to control particulate emissions. Sulfur dioxide emissions will be limited by the minimization of the use of fuel oil containing a maximum sulfur content of 2.5 percent. Good firing and operational practices will be followed to minimize NO_x, ozone, (VOC), and CO emissions.

Date of Receipt of a BACT application:
January 14, 1984

Date of Publication in the Florida Administrative Weekly:
February 10, 1984

Review Group Members:

The determination was based upon comments received from the New Source Review Section, the Air Modeling Section and the South Florida District.

BACT Determined by DER:

Pollutant	Emission Limit
Particulates	
100% Bagasse	0.150 lb/million Btu heat input
100% No. 6 oil	0.10 lb/million Btu heat input
Sulfur Dioxide	No. 6 new[1] fuel oil with a sulfur content not to exceed 1.5 percent by weight
NO_x, CO, Ozone (VOC)	O&M plan
Visible Emissions	Maximum 20% opacity except that 40% opacity is permissible for not more than 2 minutes in any one hour.

[1]The "new" oil means an oil which has been refined from crude oil and has not been used, and which may or may not contain additives.

DER Method 9 (17-2.700(6)(a)9, FAC) will be used to determine compliance with the opacity limit.

Compliance with the particulate and sulfur dioxide limitations, when firing 100% bagasse fuel, will be in accordance with 40 CFR 60, Appendix A; Methods 1, 2, 3, 4 and 5. The proposed department F-factor method, if approved, shall be used to determine the heat input rate.

Compliance with the sulfur dioxide and particulate emission limits, when firing No. 6 residual oil, will be by fuel analysis using ASTM method D-219.*

Compliance with the nitrogen oxides, carbon monoxide, and ozone (VOC) limitations will be the applicant's submittal and implementation of an Operation and Maintenance program.

*Use the most recent revision or designation of the ASTM procedure specified.

BACT Determination Rationale:

Bagasse is a plant solid waste residue remaining from the processing of sugar cane. The bagasse is burned as fuel to produce the steam required in the processing plant, and to eliminate a solid waste disposal problem. Fuel oil is fired during furnace start-up and may be fired concurrently with the bagasse as necessary to meet plant steam demands. The sulfur content of bagasse ranges from 0.1 to 0.2 percent, and has a moisture content that may vary from 50 to 60 percent depending on geographic location and climatic conditions during the sugar cane growing season.

Bagasse is by DER definition a "Carbonaceous Fuel", Rule 17-2.100(29), and the furnace is "Carbonaceous Fuel Burning Equipment", Rule 17-2.100(30).

If carbonaceous fuel were fired in a steam generator subject to New Source Performance Standards, the particulate emission limit would be 0.10 lb/million Btu heat input. If carbonaceous fuel were disposed of in a municipal incinerator, the particulate emission limit would be approximately 0.03 grains/DSCF, or less than 0.1 lb/million Btu heat input. Both of these particulate standards are currently being met.

The particulate emission limiting standard for a new source burning carbonaceous fuel and not subject to PSD review is 0.2 pound per million Btu heat input (Rule 17-2.600(10)).

On June 19, 1984, EPA proposed (49 FR 25102) a New Source Performance Standard (NSPS), Subpart Db for Industrial-Commercial-Institutional Steam Generating Units. Bagasse could be a by-product/waste as defined in the proposed subpart. The steam generator to be installed by the applicant was constructed prior to the NSPS applicability date of June 19, 1984, and therefore, the proposed emission standards of Subpart Db would not apply.

The department has determined that for U.S. Sugar Corporation's bagasse-fired steam generator No. 4, a particulate emission limit of 0.150 pound per million Btu heat input is BACT. Compliance with this standard will require a control system that is approximately 93% efficient. AP-42, Section 1.8-2, indicates that wet scrubbers are capable of achieving 90 or more percent particulate control from bagasse boilers.

The applicant will also fire No. 6 residual oil at a rate not to exceed a heat input of 225 million Btu/hr. The total amount of oil consumed in No. 4 boiler per season will not exceed 500,000 gallons. Based upon the heat input limitation this boiler would be considered a small boiler subject to Rule 17-2.600(6). Control of particulate and sulfur dioxide emissions for fossil fuel fired steam generators, subject to this rule, is usually the use of low sulfur content fuel.

The applicant provided the following cost data for No. 6 oil.

Percent sulfur content	Dollars/Gallon
2.5	.72
2.0	.79
1.5	.83
1.0	.80

The department has determined that, in this case, BACT for controlling particulate and sulfur dioxide emissions when firing residual oil will have a sulfur content, by weight, not to exceed 1.50 percent. The additional cost per season would be $55,000 if the maximum amount, 500,000 gallons, was fired in No. 4 boiler instead of the 2.5% sulfur content oil requested by the applicant. The department has determined that the firing of 1.5% or less sulfur content oil is the more economical control method when compared to the installation and operation of a FGD system.

The applicant will not be required to install a separate fuel oil storage tank for the low sulfur oil, (the existing boilers are permitted to fire 2.5% sulfur content oil). Low sulfur fuel oil shall be included in every oil delivery to the plant and shall be equal to the amount consumed in the No. 4 unit. The certified analysis of each oil shipment is to be held for five years. Air modeling indicates no adverse impact to the ambient air as a result of this procedure.

The applicant shall install an integrating fuel oil flow meter with no bypass in the boiler fuel oil line as close to the burner as practical. The meter shall be accurate to within five percent and shall be approved by the department. The recorded charts will be retained by the applicant for a minimum of five years. After the initial tests oil analysis by ASTM Method D-219 may be used in lieu of a stack test to determine compliance with the SO_2 emission limit when firing a liquid fossil fuel.

The sulfur content of bagasse ranges from 0.1 to 0.2 percent. The impact of sulfur dioxide emissions, when firing bagasse, is such that the department does not believe a FGD system is justified.

The low nitrogen content, and high moisture content of bagasse and consequently lower combustion temperatures, inherently limit NO_x emissions. The department does not believe that additional NO_x controls are justified.

Excessive carbon dioxide emissions are the result of incomplete fuel combustion. This results in the loss of available heat energy and will also cause soot to coat the boiler tubes which then lowers the boiler heat transfer efficiency. The department believes that the economics of obtaining maximum efficiency from the steam generator is sufficient incentive to minimize CO emissions. The department does not believe that an add on system to control CO emissions is justified.

The applicant has recommended that good firing and operational practices are BACT to control NO_x, ozone (VOC) and CO emissions. The department agrees and has determined that BACT to control NO_x, ozone (VOC), and CO is the preparation of an operation and maintenance (O&M) program. The O&M program must be approved by the department prior to startup of the boiler.

The term "new oil" is included to prevent the use of waste oil as fuel, emissions from which were not considered in this BACT analysis.

<u>Details of the Analysis May be Obtained by Contacting:</u>

Edward Palagyi, BACT Coordinator
Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Florida 32301

Recommended By:

C.H. Fancy

C. H. Fancy Deputy Chief, BAQM

Date: 1/14/85

~~Approved:~~

for Victoria J. Tschinkel, Secretary

Date: 1/14/85

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee	
To:	Loctn.:
To:	Loctn.:
To:	Loctn.:
From:	Date:
Reply Optional [ ] Reply Required [ ]	Info. Only [ ]
Date Due:	Date Due:

TO: Victoria J. Tschinkel

FROM: Clair Fancy Clair

DATE: January 11, 1985

SUBJ: Final Determination - U.S. Sugar Corporation Boiler No. 4

The Bureau of Air Quality Management received an application for permit to construct a bagasse/oil fired boiler from U.S. Sugar Corporation on January 10, 1984. After a long review process, a Preliminary Determination was issued on November 9, 1984. The public notice was published in The Clewiston News on November 14, 1984. The ninetieth day, after which the permit would be issued by default, is January 14, 1985. Comments were received from EPA and the applicant's attorney.

The comments from EPA require clarification only. They are addressed at the end of the Final Determination.

We have reviewed the lengthy comments submitted by the attorney for the applicant in a letter dated December 19, 1984, and have modified the specific conditions in the draft permit where we felt it was appropriate. Differences still exist between the applicant and the Department. We anticipate additional negotiations or a request for a hearing before this matter is finally resolved.

The areas of these differences are:

1. Does the Department have the authority to limit production heat input, operating parameters, etc., at a facility? (Setting the steam production for a 6 hour average maximum.)

2. Can the Department require an applicant to keep records on his operations for five years? (Normally we use two years.)

3. Must the Department accept alternate means of determining compliance because they have been used and accepted by the Department in the past? (55 percent assumed boiler efficiency for calculating heat input when we believe it is higher.)

4. What operating parameters can the Department set and require an applicant to monitor and at what frequency? (Pressure drop across the scrubber, pH.)

5. What precision can the Department use in setting a standard? (0.150 lb/MMBtu rather than 0.15 lb/MMBtu.)

6. Can the Department require concurrent emission tests on a source? (Opacity and particulate.)

7. What operating permit requirements should be included in a construction permit? (Require all conditions to be in subsequent operating permit.)

Each of these differences was addressed in our Final Determination. Although we anticipate further discussions with the applicant on these issues, the two most likely to lead to a hearing are the precision of the measurements specified and the specification of operation parameters that affect emissions.

Although there are still differences between the Bureau and the applicant, the Bureau recommends that you approve the Final Determination.

CHF/WH/s

attachments

AC26-80930

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

DEC 19 1984

DER

DEC 26 1984

BAQM

REF: 4AW-AM

Mr. C. H. Fancy, P.E.,
Deputy Chief
Bureau of Air Quality Management
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

RE: PSD-FL-100 - U.S. Sugar Corporation, Bagasse Boiler No. 4

Dear Mr. Fancy:

This is to acknowledge receipt of your November 9, 1984, letter of transmittal and the Prevention of Significant Deterioration preliminary determination for the above referenced project. We have decided that this determination will be subject to review under the Region IV Overview of State Programs policy.

We have reviewed your determination and find that Specific Condition Number 13 of your proposed construction permit will allow the sulfur dioxide 3-hour and 24-hour increments to be violated. An emission rate of 680 lbs/hr of sulfur dioxide, as permitted by Specific Condition 13, is approximately five times the emission rate used in the increment analysis. When the increment consumption for 24-hour and 3-hour periods is interpolated using this emission rate, violations will occur for both periods for up to 14 days (or when the maximum oil consumption has been reached). In addition, the use of fuel oil alone at maximum permitted usage will cause a violation of the 24-hour sulfur dioxide increment.

We request that you revise your proposed construction permit so that increment violations are not permitted to occur, or verify that increments will not be violated using the permitted emission rate for sulfur dioxide. Please address this concern prior to issuance of the final determination so that any differences can be resolved.

If you have any questions or comments regarding this letter, please contact Mr. Michael Brandon at 404/881-7654.

Sincerely yours,

James T. Wilburn, Chief
Air Management Branch
Air, Pesticides, and Toxics
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DER
DEC 21 1984
BAQM

December 19, 1984

HAND DELIVERED THIS DATE

Mr. Clair Fancy
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: United States Sugar Corporation, Clewiston Mill Boiler No. 4 - Proposed Permit No. AC26-80930 and Technical Evaluation and Preliminary Determination

Dear Mr. Fancy:

On behalf of U.S. Sugar Corporation, I would like to thank you, Bill Thomas, Willard Hanks and Cleve Holladay for meeting with David Buff of Environmental Science & Engineering (ESE) and me on December 4, 1984 to discuss the above-referenced permit. We wish to take this opportunity to relate U.S. Sugar's comments on the draft permit in writing, and to address several points which we did not have time to cover in our meeting. As you know, U.S. Sugar's concerns regarding some of the draft permit conditions are of major importance. Nevertheless, we remain hopeful that this extensive permitting effort can be resolved to a mutually acceptable fashion through the continued good faith efforts of the Department and U.S. Sugar.

In order to facilitate your review, we have provided comments, in numerical order, on each of the Specific Conditions of the draft permit which U.S. Sugar finds unacceptable, followed by suggested revisions in the permit language with deleted language shown ~~struck through~~ and new language underlined. For those conditions that U.S. Sugar finds acceptable, we have so indicated by the statement "no comment."

Specific Condition No. 1 -

This condition would limit steam production to a maximum of 250,000 lb/hr. While maximum steam production capacity for proposed Boiler No. 4 is anticipated to be 250,000 lb/hr, a permit condition flatly limiting steam production to that level would unnecessarily and unreasonably restrict operation of the boiler. In order to ensure that the steam production rate never exceeds 250,000 lb/hr at any time, the boiler operator would have to artificially restrict production to a level where even short-term fluctuations would remain below the permit limit. This is particularly true in view of the variable combustability of bagasse, the fluctuating steam demand of the sugar mill's processes, the relatively long residence time of bagasse in the combustion chamber and feed system, and the tendency of one boiler at the mill to shed off or pick up load from other boilers under some operating conditions. Fluctuations in steam flow may also result because Boiler No. 4 will be capable of operating under three different sets of steam conditions: 850 psig, 900°F design condition; 600 psig, 750°F current normal condition; and 200 psig, 500°F when the topping steam turbine generator is off line. The 250,000 lb/hr steam production rate indicated in the Boiler No. 4 permit application was based on the 850 psig, 900°F design condition. Under these circumstances, limiting the maximum steam production rate to a flat 250,000 lb/hr does not allow for different steam conditions (lower pressure and temperature) that will provide a higher steam production rate at equivalent Btu heat input.

We can discern two purposes for the Department's inclusion of a steam production limit in the draft permit. First, it provides a method of calculating hourly emissions based on a given emission rate (lb/MMBtu heat input) when, as with bagasse, the heat input cannot be quantified directly. In this regard, we would point out that the limiting ambient air quality-related standard for proposed Boiler No. 4 is the 24-hour AAQS for total suspended particulate matter. The air quality dispersion modeling performed by ESE and submitted in support of the air permit application demonstrated compliance with this 24-hour standard with Boiler No. 4 emissions at 109.1 lb/hr, a figure based upon an assumed emission rate of <u>0.2</u> lb/MMBtu and a steam production rate of 250,000 lb/hr (equivalent to 545.5 million Btu/hr heat input at 55% boiler efficiency and design steam pressure of 850 psig and temperature of 900°F). Consequently, if Boiler No. 4's emission rate is below 0.2 lb/MMBtu heat input (as required by the proposed BACT limit of 0.15 lb/MMBtu heat input), compliance with the 24-hour AAQS for TSP would be assured at steam production rates (representing heat input) in excess of 250,000 lb/hr. Moreover, since the limiting standard is a 24-hour average AAQS, Boiler No. 4 could emit at above the 109.1 lb/hr rate for more than one hour without threatening the AAQS. It is therefore apparent that an hourly limit restricting Boiler No. 4 steam production to no more than

250,000 lb/hr is not warranted on the basis of concern about compliance with the AAQS or other environmental impacts.

In discussing this issue at the December 4th meeting, a second purpose for the steam production limit was revealed by Department staff. It concerns ensuring that Boiler No. 4 is not "pushed" far beyond its design capacity with consequent adverse effects on pollution control equipment efficiency and operation. While we understand this concern, both this boiler and its scrubber have significant design capacity margins. A steam production restriction tied to actual test results, rather than to an assumption of worsened emission rates resulting from higher production, is more logical. We therefore recommend that the Department's concerns on this point be addressed by including a restriction tied to steam production levels recorded during particulate emission compliance testing in Specific Condition No. 1.

The replacement language for Specific Condition No. 1 suggested below would be adequate to ensure compliance with AAQS, and would directly relate the steam production limit to the rate at which compliance with emission limits is achieved. The proposed six-hour averaging time corresponds to the six hour sampling time required for a particulate compliance test (three test runs at two hours per run). The ten percent margin above tested capacity reflects current Department practice for many other sources.

Recommended Language:

> Steam production by Boiler No. 4 shall not exceed, ~~250,000 lb/hr~~ on a six-hour average, either
>
> (a) the level ten percent above the average rate recorded during the most recent emissions test demonstrating compliance with the applicable particulate emissions limit; or
>
> (b) the level which would result in total particulate emissions not exceeding 109.1 lb/hr, based on the results of the most recent emissions test demonstrating compliance with the applicable particulate emissions limit;

> whichever is lower. In the event that Boiler No. 4 is operated with steam conditions (pressure and temperature) different from those conditions during the particulate emission compliance test, the allowable production rate shall be adjusted correspondingly on the basis of the Btu content of the steam.
>
> The boiler shall be equipped with an instrument to continuously record steam production.

Specific Condition No. 2

The last sentence of this condition has been misstated. It should refer to "two burners with two oil guns each," instead of merely "two oil guns." This was covered in Mr. A. R. Mayo's letter of July 30, 1984, and is the installation that would restrict heat input from oil to a maximum of 225 MMBtu/hr on Boiler No. 4.

Recommended Language:

> 2. Heat input from No. 6 residual oil shall not exceed 225 million Btu/hr which is equivalent to approximately 1500 GPN of oil and 150,000 lb/hr steam. The boiler shall be built so that not more than two burners with two oil guns each can be installed.

Specific Condition No. 3 - No comment.

Specific Condition No. 4 - No comment.

Specific Condition No. 5 - No comment.

Specific Condition No. 6

This condition would require logs of oil meter readings taken every three hours on all oil-consuming equipment at the Clewiston Mill along with fuel consumption records, to be retained by U.S. Sugar for at least five years. This would be a very burdensome and space-consuming requirement that U.S. Sugar believes is unjustifiably and unreasonably more stringent than the two-year record retention period specified in U.S. Environmental Protection Agency regulations for sources subject to New Source Performance Standards. See 40 CFR §60.7(d). A two year period would also be consistent with other permits issued by the Department for recently-constructed bagasse boilers. We are aware of no special or compelling reason for diverging from this practice by imposing such an extended retention period, either for oil consumption information or for the other records for which a five year requirement is proposed in Specific Conditions No. 9 and 12. We therefore request that the Boiler No. 4 permit specify a two year period for record retention. In the event the Department has a particular interest in some item of information, two years is certainly sufficient time to review U.S. Sugar's records and request copies of the desired documents or data.

Recommended Language:

> All stationary fuel oil burning equipment at the plant shall be equipped with integrating fuel oil flow meters to record the amount of fuel oil consumed by the equipment. Oil meter readings on all oil consuming equipment shall be read and logged at least once every three hours or recorded by a continuous recorder, and these ~~logs~~ records kept for at least ~~five~~ two years. The fuel consumption records for each of these sources shall be kept for a minimum of ~~five~~ two years for department inspection. Each meter shall be calibrated annually by a method approved by the department.

Specific Condition No. 7

This condition would limit Boiler No. 4's heat input to a maximum of 545.5 million Btu/hr. Because it is impracticable to measure the heat input to a bagasse-fired boiler by any direct method, heat input must be calculated based on other measurements regarding steam production and assumptions regarding boiler efficiency. Consequently, we see no purpose in specifying a heat input limit in the Boiler No. 4 permit in addition to the steam production limit prescribed in Specific Condition No. 1. If a heat input limit were to be imposed, it should correspond to the six-hour averaging time recommended for the steam production limit in Specific Condition No. 1, since heat input will be calculated as a function of the steam production rate.

Recommendation: Deletion of Specific Condition No. 7.

Specific Condition No. 8

This condition would require a test to determine the "actual thermal efficiency" of Boiler No. 4 prior to expiration of the construction permit, to be repeated each time the operating permit is renewed. For recently-constructed bagasse-fired boilers in Florida, a boiler efficiency test has typically been performed and provided by the manufacturer as part of the performance acceptance testing for the new boiler. While Boiler NO. 4 is not a new boiler purchased from a manufacturer, U.S. Sugar is willing to have this type of efficiency testing performed once Boiler No. 4 begins operation.

We would emphasize, however, that the boiler efficiency testing contemplated for Boiler No. 4 is the "short-form" ASME test utilizing a concept and assumptions relating to fuel and flue gas analyses similar to the EPA f-factor procedure. It is not an "actual thermal efficiency test" in the sense of an energy balance based on actual measurements of fuel and heat input. Such a test would be unprecedented for bagasse-fired boilers in Florida or elsewhere, and would be highly unusual even for new industrial boilers burning more traditional fuels. Such a test would be prohibitively expensive due to the need for scales to continuously weigh the bagasse input to the boiler and associated equipment to determine bagasse moisture content and heating value. Unvalidated assumptions would also have to be made concerning radiant heat loss, unburned carbon loss, and air leaks.

Assuming that the short-form ASME test is what will be required, U.S. Sugar is also concerned that there will not be sufficient time to conduct such a test before the May 1, 1985 expiration date proposed in the draft permit, much less in time to include the results in the application for an operation permit. This is one of the reasons we have requested a later expiration date for the construction permit.

In regard to the proposed requirement to perform a thermal efficiency test "each time the operating permit is renewed. . . .," we would submit that a provision addressing this point would be appropriate in the operating permit itself, but not in the construction permit. We therefore request that this requirement be deleted.

Recommended Language:

8. Prior to the expiration of this construction permit, a test shall be made on boiler No. 4 to determine its actual thermal efficiency~~.~~ in accordance with the ASME short-form procedure. ~~This must be repeated each time the operating permit is renewed while the tubes are clean and within 14 days of the compliance tests.~~

Specific Condition No. 9

This condition would require, among other things, continuous measurement and recording of the gas pressure drop across the scrubber and the pH of the scrubber water. In view of the expense of purchasing the necessary equipment and the likelihood of problems in operating and maintaining such equipment to serve the intended purpose, U.S. Sugar requests a revision of this permit condition. Based upon our discussions on December 4th, we have developed the revised language set forth below. U.S. Sugar also reiterates its objection to the five-year recorded retention requirements.

Recommended Language:

a. The scrubber controlling the emissions from boiler No. 4 shall be built to Joy Manufacturing Company's specifications for their Turbulaire, Type D, Size 200 spray impingement scrubber and equipped with instruments to measure ~~and continuously record~~ the gas pressure drop, scrubber water pressure, volumetric flow of the scrubber water, and pH of the scrubber water. Instruments to continuously record the scrubber water pressure and volumetric flow shall also be provided.

b. Hourly readings of the gas pressure drop shall be taken and logged for each day Boiler No. 4 operates through its first full season of operation. The hourly data shall be converted into consecutive three hour averages. If any three hour average gas pressure drop falls more than ten percent below the average pressure drop recorded during the particulate emissions compliance testing, the department may require installation of an instrument to continuously measure and record the gas pressure drop.

c. Hourly readings of the pH of the scrubber water shall be taken and logged for each hour during which bagasse is burned in Boiler No. 4 through its first full season of operation. The hourly data shall be converted into consecutive three hour averages. If any three hour average pH value falls more than ten percent below neutral pH, the department may require installation of an instrument to continuously measure and record scrubber water pH.

d. Records of these measurements required by this condition shall be ~~obtained each day boiler No. 4 operates and these records~~ transmitted to the Central Air Permitting Section in the department's Bureau of Air Quality Management after the end of the season. ~~kept for a minimum of five years for department inspection.~~

Specific Condition No. 10

U.S. Sugar has serious objections to provisions of this condition, which would: impose a particulate emission limit of 0.150 lb/million Btu heat input for bagasse fuel; require compliance with that limit to be based upon an "energy balance that uses measured boiler efficiency"; and specify that the compliance test be conducted with the boiler operating at its "maximum" or "permitted" capacity, whichever is lower. Carrying the particulate limit out to three decimal places by adding the 0 in the thousandths column is, to the best of our knowledge, unprecedented not only for bagasse boilers but for other types of sources as well. Limitations on the precision and accuracy of EPA's Reference Method 5 make such a very close tolerance in the emission limit ludicrous. Moreover, the practical effect of changing the 0.15

lb/million Btu limit to 0.150 lb/million Btu is a tightening of the enforceable standard. While a test result of .151 would currently be rounded to .15 and thus show compliance with a .15 lb/million Btu standard, the extra one-thousandths of a pound of particulate matter per million Btu heat input would indicate noncompliance with the .150 standard. This is more than a mere hypothetical possibility; the average of the three test runs constituting the 1983 compliance test for U.S. Sugar's Bryant Mill Boiler No. 5 was 0.154 lb/million Btu heat input. (See Boiler No. 4 Application at D-6.) There is no justification for departing from past practice by taking the particulate emission limit to such an extreme.

U.S. Sugar must register strong objection to the provision of this Condition requiring compliance with the particulate emission limit to be determined on the basis of an energy balance utilizing "measured boiler efficiency." While U.S. Sugar is willing to have a "short-form" ASME boiler efficiency test performed on Boiler No. 4, we cannot agree to use the results of that test to calculate the heat input for purposes of the particulate emissions compliance test. Such an approach would represent a radical departure from the 55% boiler efficiency assumption agreed upon by the Department and the Florida sugar industry in 1974 and utilized ever since. I regret that, contrary to my statements at our December 4, 1984 meeting, I have been unable to locate any document that clearly indicates the Department's concurrence in the use of the 55 percent assumption for bagasse boilers. Nevertheless, there can be no question that, in practice, the 55% assumption has been used and accepted in calculating compliance test results since the emission limiting standards for bagasse boilers in Chapter 17-2, F.A.C. were first adopted in 1974. From the documents I have reviewed, Department personnel involved in the original discussions included Walt Starnes and Mike Harley in Tallahassee, along with Tom Davis in the Fort Myers District Office.

The reasons for utilizing an assumed boiler efficiency for compliance test purposes remain as compelling now as they were ten years ago. Extreme and rapid fluctuations in bagasse moisture content, heating value and other constituents cause measured boiler efficiency determinations to vary unpredictably in a fashion totally unrelated to how well the boiler is operated. The variability of bagasse and associated problems in measuring boiler efficiency are very likely to make such determinations non-correlatable with actual heat input over the period of even one particulate test.

It was these factors that originally lead to the establishment of the 55 percent efficiency assumption, and it is by the use of that assumption that all particulate compliance test results have been calculated since the lb/million Btu limits for new and existing bagasse boilers were added to the Department's rules. These are the test results that U.S. Sugar presented in its permit application and relied upon in considering the probabilities of complying with a BACT limit of 0.15 lb/million Btu heat input. Presumably, these are also the test results utilized by the Department in reaching its preliminary BACT determination. Also note that the 55 percent efficiency assumption is the link correlating the steam production rate of 250,000 lb/hr with the maximum heat input figure of 545.5 million Btu/hr.

Under these circumstances, it is unreasonable and unjustified for the Department to totally ignore past practice and require U.S. Sugar to blindly speculate about Boiler No. 4's ability to comply with a stringent BACT limit while utilizing a different heat input determination method. In this regard we would also emphasize that, as a predicate to rulemaking desired by the Department to devise an f-factor method applicable to bagasse boilers, the Florida Sugar Cane League is presently engaged in discussions with BAQM Chief Steve Smallwood regarding a study to generate much-needed information on this topic. U.S. Sugar is prepared to utilize the f-factor method in calculating particulate emission rates from Boiler No. 4, but not, at this time, for purposes of demonstrating compliance with the BACT emission limit for particulate matter imposed in the Department permit. In the event that an f-factor method for bagasse boilers is adopted as part of the compliance test method for bagasse boilers, Boiler No. 4 will, of course, be tested accordingly. Until then, however, it is appropriate and reasonable that the 55 percent boiler efficiency assumption be retained.

In view of the proposed language we have recommended for Specific Condition No. 1 regarding limitations on steam production rate, the sentence in Specific Condition No. 10 concerning the capacity at which the compliance test must be conducted is unnecessary. We therefore recommend deletion of that sentence.

Recommended Language:

10. Particulate matter emissions from boiler No. 4 shall not exceed 0.15~~0~~ lb/million Btu heat input for bagasse fuel or 0.10 lb/million Btu heat input for No. 6 residual oil fuel. In the event that both fuels are burned concurrently, the allowable particulate matter emissions shall be prorated from the allowable standards for each fuel by their respective heat inputs. Compliance with the particulate matter standards shall be determined by EPA Reference Methods 1, 2, 3, 4, and 5 as described in 40 CFR 60, Appendix A. ~~Emission test results shall be calculated by both the F factor and an energy balance that uses measured boiler efficiency. Until the F factor procedure is adopted by the department, t~~The compliance test results shall be ~~based on the energy balance~~ calculated in accordance with the currently utilized method for determining heat input from bagasse boilers, or any new method subsequently adopted by department rule. ~~All compliance test shall be conducted while the boiler is operating at its maximum or permitted capacity, whichever is lower.~~ For informational purposes only, the particulate matter emission rate shall also be calculated by utilizing both the F-factor and the short form ASME boiler efficiency test results along with the initial particulate emissions compliance test data. The South Florida District Office shall be notified 15 days prior to any compliance test. Scrubber parameters listed in Specific Condition No. 9 shall be recorded during the test and included in the test report. Measurements of gas pressure drop across the scrubber shall be logged every 15 minutes during the period of the test.

Specific Condition No. 11

This condition would require particulate matter emissions and visible emissions to "always be determined concurrently." U.S. Sugar does not object in concept to simultaneous particulate and visible emissions testing. We are concerned with the apparent inflexibility of the word "always" as used in this draft permit condition, however. Numerous practical problems may crop up in conducting a visible emissions test at the same time as a particulate test. Visible emissions tests can be performed only by certified observers, and it is possible that the observer may not be available to take and record the necessary one hour of visual readings when the particulate stack test is being conducted. Even if a certified observer is available, other circumstances may preclude performance of a visible emissions test concurrently with the particulate compliance test. For example, weather, cloud conditions, or angle of sunlight may make a valid visible emissions test impossible during the stack test (which must be scheduled well in advance). It would be unreasonable and wasteful to have a perfectly good particulate test invalidated under such circumstances simply because a visible emissions test could not be performed.

Recommended Language

> 11. Visible emissions from boiler No. 4 shall not exceed 20 percent opacity except that 40 percent opacity is allowed for 2 minutes during any hour. Compliance with this standard shall be determined by DER Method 9 as described in Chapter 17-2, FAC. The particulate matter emissions and visible emissions shall ~~always~~ be determined concurrently~~.~~ whenever feasible.

Specific Condition No. 12.

This condition places restrictions on the sulfur content of fuel oil burned at Boiler No. 4 and the other Clewiston Mill boilers, reflecting the Department's preliminary BACT determination for sulfur dioxide emissions. U.S. Sugar is prepared to accept the requirement to replace higher sulfur content oil with lower sulfur content oil, but we believe a slight clarification of the draft permit language would be helpful. We would also reiterate the objection to a five year record retention requirement.

Recommended Language:

> 12. Any No. 6 residual ~~oil~~ fuel oil burned in this boiler shall contain ~~less~~ no more than 2.5 percent sulfur and shall be replaced during the season in which it is burned with fuel oil containing no more than 1.5 percent sulfur~~, during that season~~. Compliance with this condition shall be determined from certified analysis of the replacement oil by ASTM Method D-219, records of the quantity of fuel oil consumed in the No. 4 boiler, and invoices for the oil purchased. These records shall be kept for a minimum of ~~five~~ two years for regulatory agency inspection.

Specific Condition 13

U.S. Sugar's objections to this condition, which concerns sulfur dioxide emission limits and compliance testing, are essentially the same as those expressed in regard to Specific Condition No. 10.

Recommended Language

> 13. Sulfur dioxide emissions from the boiler, while it is burning 100 percent bagasse fuel, shall not exceed 0.25 lb/million BTU heat input as determined by the EPA Method 6 as described in 40 CFR 60, Appendix A. ~~Emission test results shall be calculated by both the F factor and an energy balance that uses measured boiler efficiency. Until the F factor procedure is adopted by the department, t~~The compliance test results shall be calculated in accordance with the currently utilized method for determining heat input for bagasse boilers, or any new method subsequently adopted by department rule. For informational purposes only, the sulfur dioxide emission rate shall also be calculated by

> utilizing both the F-factor procedure and the short form ASME boiler efficiency test results along with the initial sulfur dioxide compliance test data. ~~Boiler No. 4 shall be tested for sulfur dioxide emissions while it is operating at permitted or maximum capacity, whichever is less, before March 1, 1985.~~ The District shall be notified 15 days prior to the scheduled test. The pH of the scrubber water shall be measured and logged every fifteen minutes during the compliance test and, along with the other scrubber parameters listed in Specific Condition No. 9, shall be included in the test report. Sulfur dioxide emissions from boiler No. 4, while it is burning a mixture of oil and bagasse, shall not exceed 680 lb/hr.

Specific Condition No. 14

U. S. Sugar's only concern about this condition is the provision that would limit VOC emissions to the level measured in the compliance test if that level is lower than 1.7 lb/ton of bagasse. We are aware of no ambient air quality concerns that would warrant imposing a VOC emission limit lower than 1.7 lb/ton of bagasse. Moreover, it is unreasonable to set an enforceable emission limit on the basis of a single stack test. U.S. Sugar does not have adequate data to indicate what the range of potential VOC emissions may be for the proposed boiler. We therefore object to the arbitrary imposition of a limit based on one test, and we recommend deletion of the language in this permit condition regarding "potential emissions." We would also like to confirm our understanding that the Operation and Maintenance Plan called for in this condition is to be submitted along with the application for an operation permit.

Recommended Language

> 14. Emissions of carbon monoxide and volatile organic compounds shall be maintained at the lowest possible level through the implementation of an Operation and Maintenance plan that is approved by the department. Emissions of

> carbon monoxide shall not exceed 0.25 lb/million BTU as determined by EPA Method 10. Emissions of volatile organic compounds shall not exceed 1.7 lb/ton of bagasse ~~or the potential emissions from burning bagasse, whichever is lower,~~ as determined by EPA Method 25. These test methods are described in 40 CFR 60, Appendix A. After the initial compliance tests, compliance tests for these pollutants will not be required if the visible emissions from boiler No. 4 are below 20 percent opacity if the initial VOC Method 25 tests show compliance.

<u>Specific Condition No. 15</u> - No comment.

<u>Specific Condition No. 16</u> - No comment.

<u>Specific Condition No. 17</u>

As proposed by U. S. Sugar in the revised permit application package transmitted to the Department by letter dated February 1, 1984, this condition would require the particulate emission limit in the operation permits for Clewiston Boilers No. 1 and 2 to be revised from 0.3 lb/million Btu heat input to 0.25 lb/million Btu heat input. This proposal was part of the strategy developed to ensure compliance with the 24-hour AAQS for total suspended particulate matter. As we discussed on December 4th, U.S. Sugar wishes to suggest a slightly different approach under which AAQS compliance is assured by <u>either</u> restricting particulate emissions for Boilers No. 1 and 2 to 0.25 lb/million Btu heat input or, in the event that level is exceeded, keeping Boilers No. 5 and 6 out of operation for that season. Each of these options will ensure that there will be no predicted violation of the AAQS under worst-case conditions, and in fact the option of keeping Boilers No. 5 and 6 off-line was the strategy originally proposed by U.S. Sugar in the initial permit application submitted to the Department by letter dated January 9, 1984.

<u>Recommended Language</u>

> 17. The pellet mills at this plant shall be permanently shut down, made inoperative by disconnecting the electrical power or by other means as approved by

> the department, and the permits to operate surrendered to the South Florida District Office prior to commercial operation of boiler No. 4. Prior to issuance of an operating permit for boiler No. 4, ~~T~~the permits to operate boilers Nos. ~~1 and 2~~ 5 and 6 shall be revised ~~to limit particulate matter emissions~~ to provide that those boilers shall not be operated during any season unless and until particulate emission testing of boilers No. 1 and 2 for that season demonstrates a particulate emission rate for each boiler of no greater than 0.25 lb/million Btu heat input. ~~prior to the issuance of an operating permit for boiler No. 4.~~

Specific Condition No. 18

This condition would require U.S. Sugar to submit an application for an operation permit for Boiler No. 4 90 days prior to expiration of the construction permit. As the draft construction permit includes an expiration date of May 1, 1985, the operation permit application would be due February 1, 1985. Under the present schedule, construction of Boiler No. 4 may not even be completed by that date. We believe the construction permit for Boiler No. 4 should provide ample time for initial operation, debugging compliance testing and boiler efficiency testing. We therefore recommend the change set forth below. We also request that the expiration date for the Boiler No. 4 construction permit be changed to one year from the date of issuance of the final permit. This will ensure that initial testing can continue in the first part of the next year's season (1985-86) in the event construction delays or other problems preclude completion of all necessary testing before the end of the current season.

Recommended Language

> 18. The applicant will demonstrate compliance with the conditions of this construction permit and submit a complete application for a permit to operate to the District office ~~9~~60 days prior to the expiration of this construction permit. The applicant may continue to operate in

> compliance with all terms of this construction permit until its expiration or until issuance of a permit to operate.

Specific Condition No. 19

This condition would specify a number of requirements to be imposed in the operation permit for Boiler No. 4. While we believe such requirements would be more appropriately addressed in the permitting process on an application for an operation permit, there is only one point in the proposed condition on which U.S. Sugar has serious concerns. The draft language would "require the scrubber to be operated at or above the pressure drop that existed during the compliance test." We understand the department's rationale in this requirement, but the language used provides absolutely no flexibility. If the particulate compliance test results were 0.05 lb/million Btu heat input with an average gas pressure drop of six inches, any pressure drop ever slightly below the six inch level would be a violation of the permit, even though the compliance test data would indicate a wide margin before the particulate emission limit is reached. We therefore recommend that disposition of the question of the range of allowable scrubber pressure drop levels be deferred until after the initial compliance test data is available.

Recommended Language

> 19. Any permit to operate issued for boiler No. 4 will limit operation to 182 days per season; require the scrubber to be operated at or above the pressure drop ~~that existed during the compliance test~~ determined to provide reasonable assurance of compliance with the applicable particulate emission limit; require as a minimum, annual particulate matter and visible emission tests; an annual operation report which will include the amount of oil burned at the plant to determine compliance with the limits on oil usage in this permit and the sulfur content of the residual oil purchased for the season; and a monthly summary of the scrubber parameters listed in Specific Condition No. 9.

Specific Condition No. 20

The whole thrust of this condition is upon what will happen in the event Boiler No. 4 fails the initial particulate emissions compliance test. We believe that it is highly inappropriate and unreasonable to even attempt to address such a hypothetical eventuality in this construction permit. If Boiler No. 4 fails to demonstrate compliance with the applicable particulate emission limit, the Department will have available the full range of enforcement options, as well as the authority to deny an operation permit. The point we would stress is that prescribing in detail the course of events required if there is a compliance problem would unfairly deprive U.S. Sugar of its rights and options. Nonetheless, in view of the Department's concerns in this regard, U.S. Sugar is prepared to accept a portion of the language proposed in Specific Condition No. 20. What U.S. Sugar cannot and will not do is waive its right to seek a modification of the BACT emission limit if, based on the results of testing and expert consultation, there is no feasible way for Boiler No. 4 to comply with the limit. Under such circumstances, U.S. Sugar must keep open the option of demonstrating to the Department that the BACT determination should be adjusted. We therefore offer the following recommended changes to Specific Condition No. 20.

Recommended Language

a. Measure the inlet and outlet particulate matter emissions from the scrubber by EPA Method 5.

b. Measure the particulate matter size distribution by a method approved by the department.

c. ~~Hire an independent Florida Professional Engineer that has~~Seek outside expert advice from an engineer or engineering firm with a background in scrubber design ~~and is not associated with the Florida Sugar Cane industry~~ to recommend modifications of the scrubber that ~~will~~ are intended to bring the emissions into compliance with the permit conditions.

d. ~~If the emissions are not in compliance with the emission standards by the start of the 1985-86 season, U.S. Sugar must obtain a consent order, with appropriate financial penalties, from the Florida Department of Environmental Regulation and EPA, Region IV, before resuming commercial operations of boiler No. 4.~~ If, based upon the data and advice developed pursuant to this Specific Condition, no practicable method of achieving consistent compliance with the 0.15 lb/million Btu heat input particulate emission limit is identified within the BACT concept, the Department will consider modifying the limit to reflect a value that is attainable on a continuous basis, subject to the approval of the U.S. Environmental Protection Agency.

In closing, I would like to express my appreciation for your time and consideration in working toward solutions to the issues raised by the Boiler No. 4 permit. If you have any questions or if you believe it would be helpful to hold another meeting in an effort to resolve any outstanding issues, please do not hesitate to call me.

Sincerely,

Peter C. Cunningham

PCC/gs

cc: Bill Thomas
Willard Hanks
Cleve Holladay
Carol Forthman
Aryan Mayo
David Buff

250,000 lb/hr is not warranted on the basis of concern about compliance with the AAQS or other environmental impacts.

In discussing this issue at the December 4th meeting, a second purpose for the steam production limit was revealed by Department staff. It concerns ensuring that Boiler No. 4 is not "pushed" far beyond its design capacity with consequent adverse effects on pollution control equipment efficiency and operation. While we understand this concern, both this boiler and its scrubber have significant design capacity margins. A steam production restriction tied to actual test results, rather than to an assumption of worsened emission rates resulting from higher production, is more logical. We therefore recommend that the Department's concerns on this point be addressed by including a restriction tied to steam production levels recorded during particulate emission compliance testing in Specific Condition No. 1.

The replacement language for Specific Condition No. 1 suggested below would be adequate to ensure compliance with AAQS, and would directly relate the steam production limit to the rate at which compliance with emission limits is achieved. The proposed six-hour averaging time corresponds to the six hour sampling time required for a particulate compliance test (three test runs at two hours per run). The ten percent margin above tested capacity reflects current Department practice for many other sources.

Recommended Language:

> Steam production by Boiler No. 4 shall not exceed, ~~250,000 lb/hr~~ on a six-hour average, either
>
> (a) the level ten percent above the average rate recorded during the most recent emissions test demonstrating compliance with the applicable particulate emissions limit; or
>
> (b) the level which would result in total particulate emissions not exceeding 109.1 lb/hr, based on the results of the most recent emissions test demonstrating compliance with the applicable particulate emissions limit;

NO

250,000
6 hr
no value > 275

maybe

whichever is lower. In the event that Boiler No. 4 is operated with steam conditions (pressure and temperature) different from those conditions during the particulate emission compliance test, the allowable production rate shall be adjusted correspondingly on the basis of the Btu content of the steam.

The boiler shall be equipped with an instrument to continuously record steam production.

Specific Condition No. 2

The last sentence of this condition has been misstated. It should refer to "two burners with two oil guns each," instead of merely "two oil guns." This was covered in Mr. A. R. Mayo's letter of July 30, 1984, and is the installation that would restrict heat input from oil to a maximum of 225 MMBtu/hr on Boiler No. 4.

Recommended Language:

2. Heat input from No. 6 residual oil shall not exceed 225 million Btu/hr which is equivalent to approximately 1500 GPN of oil and 150,000 lb/hr steam. The boiler shall be built so that not more than two burners with two oil guns each can be installed.

OK as I recall

Specific Condition No. 3 - No comment.

Specific Condition No. 4 - No comment.

Specific Condition No. 5 - No comment.

Specific Condition No. 6

This condition would require logs of oil meter readings taken every three hours on all oil-consuming equipment at the Clewiston Mill along with fuel consumption records, to be retained by U.S. Sugar for at least five years. This would be a very burdensome and space-consuming requirement that U.S. Sugar believes is unjustifiably and unreasonably more stringent than the two-year record retention period specified in U.S. Environmental Protection Agency regulations for sources subject to New Source Performance Standards. See 40 CFR §60.7(d). A two year period would also be consistent with other permits issued by the Department for recently-constructed bagasse boilers. We are aware of no special or compelling reason for diverging from this practice by imposing such an extended retention period, either for oil consumption information or for the other records for which a five year requirement is proposed in Specific Conditions No. 9 and 12. We therefore request that the Boiler No. 4 permit specify a two year period for record retention. In the event the Department has a particular interest in some item of information, two years is certainly sufficient time to review U.S. Sugar's records and request copies of the desired documents or data.

?

Recommended Language:

> All stationary fuel oil burning equipment at the plant shall be equipped with integrating fuel oil flow meters to record the amount of fuel oil consumed by the equipment. Oil meter readings on all oil consuming equipment shall be read and logged at least once every three hours or recorded by a continuous recorder, and these ~~logs~~ records kept for at least ~~five~~ two years. The fuel consumption records for each of these sources shall be kept for a minimum of ~~five~~ two years for department inspection. Each meter shall be calibrated annually by a method approved by the department.

OK
keep 5 years

Specific Condition No. 7

This condition would limit Boiler No. 4's heat input to a maximum of 545.5 million Btu/hr. Because it is impracticable to measure the heat input to a bagasse-fired boiler by any direct method, heat input must be calculated based on other measurements regarding steam production and assumptions regarding boiler efficiency. Consequently, we see no purpose in specifying a heat input limit in the Boiler No. 4 permit in addition to the steam production limit prescribed in Specific Condition No. 1. If a heat input limit were to be imposed, it should correspond to the six-hour averaging time recommended for the steam production limit in Specific Condition No. 1, since heat input will be calculated as a function of the steam production rate.

need boiler

still need to refer to it as 545.5 mm BW Boiler

Recommendation: Deletion of Specific Condition No. 7.

Specific Condition No. 8

This condition would require a test to determine the "actual thermal efficiency" of Boiler No. 4 prior to expiration of the construction permit, to be repeated each time the operating permit is renewed. For recently-constructed bagasse-fired boilers in Florida, a boiler efficiency test has typically been performed and provided by the manufacturer as part of the performance acceptance testing for the new boiler. While Boiler NO. 4 is not a new boiler purchased from a manufacturer, U.S. Sugar is willing to have this type of efficiency testing performed once Boiler No. 4 begins operation.

We would emphasize, however, that the boiler efficiency testing contemplated for Boiler No. 4 is the "short-form" ASME test utilizing a concept and assumptions relating to fuel and flue gas analyses similar to the EPA f-factor procedure. It is not an "actual thermal efficiency test" in the sense of an energy balance based on actual measurements of fuel and heat input. Such a test would be unprecedented for bagasse-fired boilers in Florida or elsewhere, and would be highly unusual even for new industrial boilers burning more traditional fuels. Such a test would be prohibitively expensive due to the need for scales to continuously weigh the bagasse input to the boiler and associated equipment to determine bagasse moisture content and heating value. Unvalidated assumptions would also have to be made concerning radiant heat loss, unburned carbon loss, and air leaks.

Assuming that the short-form ASME test is what will be required, U.S. Sugar is also concerned that there will not be sufficient time to conduct such a test before the May 1, 1985 expiration date proposed in the draft permit, much less in time to include the results in the application for an operation permit. This is one of the reasons we have requested a later expiration date for the construction permit.

In regard to the proposed requirement to perform a thermal efficiency test "each time the operating permit is renewed. . .," we would submit that a provision addressing this point would be appropriate in the operating permit itself, but not in the construction permit. We therefore request that this requirement be deleted.

Recommended Language:

> 8. Prior to the expiration of this construction permit, a test shall be made on boiler No. 4 to determine its actual thermal efficiency~~.~~ in accordance with the ASME short-form procedure. ~~This must be repeated each time the operating permit is renewed while the tubes are clean and within 14 days of the compliance tests.~~

NO, we in CAPS want to be certain that this provision goes in op permit & is federally enforceable.

Specific Condition No. 9

This condition would require, among other things, continuous measurement and recording of the gas pressure drop across the scrubber and the pH of the scrubber water. In view of the expense of purchasing the necessary equipment and the likelihood of problems in operating and maintaining such equipment to serve the intended purpose, U.S. Sugar requests a revision of this permit condition. Based upon our discussions on December 4th, we have developed the revised language set forth below. U.S. Sugar also reiterates its objection to the five-year recorded retention requirements.

Recommended Language:

> a. The scrubber controlling the emissions from boiler No. 4 shall be built to Joy Manufacturing Company's specifications for their Turbulaire, Type D, Size 200 spray impingement scrubber and equipped with instruments to measure ~~and continuously record~~ the gas pressure drop, scrubber water pressure, volumetric flow of the scrubber water, and pH of the scrubber water. Instruments to continuously record the scrubber water pressure and volumetric flow shall also be provided.
>
> b. Hourly readings of the gas pressure drop shall be taken and logged for each day Boiler No. 4 operates through its first full season of operation. The hourly data shall be converted into con-

Not just one year, specially on ΔP

actual heat input over the period of even one particulate test.

It was these factors that originally lead to the establishment of the 55 percent efficiency assumption, and it is by the use of that assumption that all particulate compliance test results have been calculated since the lb/million Btu limits for new and existing bagasse boilers were added to the Department's rules. These are the test results that U.S. Sugar presented in its permit application and relied upon in considering the probabilities of complying with a BACT limit of 0.15 lb/million Btu heat input. Presumably, these are also the test results utilized by the Department in reaching its preliminary BACT determination. Also note that the 55 percent efficiency assumption is the link correlating the steam production rate of 250,000 lb/hr with the maximum heat input figure of 545.5 million Btu/hr.

Under these circumstances, it is unreasonable and unjustified for the Department to totally ignore past practice and require U.S. Sugar to blindly speculate about Boiler No. 4's ability to comply with a stringent BACT limit while utilizing a different heat input determination method. In this regard we would also emphasize that, as a predicate to rulemaking desired by the Department to devise an f-factor method applicable to bagasse boilers, the Florida Sugar Cane League is presently engaged in discussions with BAQM Chief Steve Smallwood regarding a study to generate much-needed information on this topic. U.S. Sugar is prepared to utilize the f-factor method in calculating particulate emission rates from Boiler No. 4, but not, at this time, for purposes of demonstrating compliance with the BACT emission limit for particulate matter imposed in the Department permit. In the event that an f-factor method for bagasse boilers is adopted as part of the compliance test method for bagasse boilers, Boiler No. 4 will, of course, be tested accordingly. Until then, however, it is appropriate and reasonable that the 55 percent boiler efficiency assumption be retained.

agree

In view of the proposed language we have recommended for Specific Condition No. 1 regarding limitations on steam production rate, the sentence in Specific Condition No. 10 concerning the capacity at which the compliance test must be conducted is unnecessary. We therefore recommend deletion of that sentence.

Mr. Clair Fancy
Page 11

Recommended Language:

10. Particulate matter emissions from boiler No. 4 shall not exceed 0.15~~0~~ lb/million Btu heat input for bagasse fuel or 0.10 lb/million Btu heat input for No. 6 residual oil fuel. In the event that both fuels are burned concurrently, the allowable particulate matter emissions shall be prorated from the allowable standards for each fuel by their respective heat inputs. Compliance with the particulate matter standards shall be determined by EPA Reference Methods 1, 2, 3, 4, and 5 as described in 40 CFR 60, Appendix A. ~~Emission test results shall be calculated by both the F factor and an energy balance that uses measured boiler efficiency. Until the F factor procedure is adopted by the department, t~~The compliance test results shall be ~~based on the energy balance~~ calculated in accordance with the currently utilized method for determining heat input from bagasse boilers, or any new method subsequently adopted by department rule. ~~All compliance test shall be conducted while the boiler is operating at its maximum or permitted capacity, whichever is lower.~~ For informational purposes only, the particulate matter emission rate shall also be calculated by utilizing both the F-factor and the short form ASME boiler efficiency test results along with the initial particulate emissions compliance test data. The South Florida District Office shall be notified 15 days prior to any compliance test. Scrubber parameters listed in Specific Condition No. 9 shall be recorded during the test and included in the test report. Measurements of gas pressure drop across the scrubber shall be logged every 15 minutes during the period of the test.

F factor for each test as a surrogate for boiler efficiency

Specific Condition No. 11

This condition would require particulate matter emissions and visible emissions to "always be determined concurrently." U.S. Sugar does not object in concept to simultaneous particulate and visible emissions testing. We are concerned with the apparent inflexibility of the word "always" as used in this draft permit condition, however. Numerous practical problems may crop up in conducting a visible emissions test at the same time as a particulate test. Visible emissions tests can be performed only by certified observers, and it is possible that the observer may not be available to take and record the necessary one hour of visual readings when the particulate stack test is being conducted. Even if a certified observer is available, other circumstances may preclude performance of a visible emissions test concurrently with the particulate compliance test. For example, weather, cloud conditions, or angle of sunlight may make a valid visible emissions test impossible during the stack test (which must be scheduled well in advance). It would be unreasonable and wasteful to have a perfectly good particulate test invalidated under such circumstances simply because a visible emissions test could not be performed.

Recommended Language

> 11. Visible emissions from boiler No. 4 shall not exceed 20 percent opacity except that 40 percent opacity is allowed for 2 minutes during any hour. Compliance with this standard shall be determined by DER Method 9 as described in Chapter 17-2, FAC. The particulate matter emissions and visible emissions shall ~~always~~ be determined concurrently~~.~~ whenever feasible.

Dept policy that they are concurrent
OK

Specific Condition No. 12.

This condition places restrictions on the sulfur content of fuel oil burned at Boiler No. 4 and the other Clewiston Mill boilers, reflecting the Department's preliminary BACT determination for sulfur dioxide emissions. U.S. Sugar is prepared to accept the requirement to replace higher sulfur content oil with lower sulfur content oil, but we believe a slight clarification of the draft permit language would be helpful. We would also reiterate the objection to a five year record retention requirement.

Recommended Language:

> 12. Any No. 6 residual ~~oil~~ fuel oil burned in this boiler shall contain ~~less~~ no more than 2.5 percent sulfur and shall be replaced during the season in which it is burned with fuel oil containing no more than 1.5 percent sulfur~~, during that season~~. Compliance with this condition shall be determined from certified analysis of the replacement oil by ASTM Method D-219, records of the quantity of fuel oil consumed in the No. 4 boiler, and invoices for the oil purchased. These records shall be kept for a minimum of ~~five~~ two years for regulatory agency inspection.

it's < rounded

Specific Condition 13

U.S. Sugar's objections to this condition, which concerns sulfur dioxide emission limits and compliance testing, are essentially the same as those expressed in regard to Specific Condition No. 10.

Recommended Language

> 13. Sulfur dioxide emissions from the boiler, while it is burning 100 percent bagasse fuel, shall not exceed 0.25 lb/million BTU heat input as determined by the EPA Method 6 as described in 40 CFR 60, Appendix A. ~~Emission test results shall be calculated by both the F factor and an energy balance that uses measured boiler efficiency. Until the F factor procedure is adopted by the department, t~~The compliance test results shall be calculated in accordance with the currently utilized method for determining heat input for bagasse boilers, or any new method subsequently adopted by department rule. For informational purposes only, the sulfur dioxide emission rate shall also be calculated by

+ factor each test as surrogate

utilizing both the F-factor procedure and the short form ASME boiler efficiency test results along with the initial sulfur dioxide compliance test data. ~~Boiler No. 4 shall be tested for sulfur dioxide emissions while it is operating at permitted or maximum capacity, whichever is less, before March 1, 1985.~~ The District shall be notified 15 days prior to the scheduled test. The pH of the scrubber water shall be measured and logged every fifteen minutes during the compliance test and, along with the other scrubber parameters listed in Specific Condition No. 9, shall be included in the test report. Sulfur dioxide emissions from boiler No. 4, while it is burning a mixture of oil and bagasse, shall not exceed 680 lb/hr.

Specific Condition No. 14

U. S. Sugar's only concern about this condition is the provision that would limit VOC emissions to the level measured in the compliance test if that level is lower than 1.7 lb/ton of bagasse. We are aware of no ambient air quality concerns that would warrant imposing a VOC emission limit lower than 1.7 lb/ton of bagasse. Moreover, it is unreasonable to set an enforceable emission limit on the basis of a single stack test. U.S. Sugar does not have adequate data to indicate what the range of potential VOC emissions may be for the proposed boiler. We therefore object to the arbitrary imposition of a limit based on one test, and we recommend deletion of the language in this permit condition regarding "potential emissions." We would also like to confirm our understanding that the Operation and Maintenance Plan called for in this condition is to be submitted along with the application for an operation permit.

Recommended Language

14. Emissions of carbon monoxide and volatile organic compounds shall be maintained at the lowest possible level through the implementation of an Operation and Maintenance plan that is approved by the department. Emissions of

> carbon monoxide shall not exceed 0.25 lb/million BTU as determined by EPA Method 10. Emissions of volatile organic compounds shall not exceed 1.7 lb/ton of bagasse ~~or the potential emissions from burning bagasse, whichever is lower~~, as determined by EPA Method 25. These test methods are described in 40 CFR 60, Appendix A. After the initial compliance tests, compliance tests for these pollutants will not be required if the visible emissions from boiler No. 4 are below 20 percent opacity if the initial VOC Method 25 tests show compliance.

OK

<u>Specific Condition No. 15</u> - No comment.

<u>Specific Condition No. 16</u> - No comment.

<u>Specific Condition No. 17</u>

As proposed by U. S. Sugar in the revised permit application package transmitted to the Department by letter dated February 1, 1984, this condition would require the particulate emission limit in the operation permits for Clewiston Boilers No. 1 and 2 to be revised from 0.3 lb/million Btu heat input to 0.25 lb/million Btu heat input. This proposal was part of the strategy developed to ensure compliance with the 24-hour AAQS for total suspended particulate matter. As we discussed on December 4th, U.S. Sugar wishes to suggest a slightly different approach under which AAQS compliance is assured by <u>either</u> restricting particulate emissions for Boilers No. 1 and 2 to 0.25 lb/million Btu heat input or, in the event that level is exceeded, keeping Boilers No. 5 and 6 out of operation for that season. Each of these options will ensure that there will be no predicted violation of the AAQS under worst-case conditions, and in fact the option of keeping Boilers No. 5 and 6 off-line was the strategy originally proposed by U.S. Sugar in the initial permit application submitted to the Department by letter dated January 9, 1984.

<u>Recommended Language</u>

> 17. The pellet mills at this plant shall be permanently shut down, made inoperative by disconnecting the electrical power or by other means as approved by

> the department, and the permits to operate surrendered to the South Florida District Office prior to commercial operation of boiler No. 4. Prior to issuance of an operating permit for boiler No. 4, ~~T~~the permits to operate boilers Nos. ~~1 and 2~~ 5 and 6 shall be revised ~~to limit particulate matter emissions~~ to provide that those boilers shall not be operated during any season unless and until particulate emission testing of boilers No. 1 and 2 for that season demonstrates a particulate emission rate for each boiler of no greater than 0.25 lb/million Btu heat input. ~~prior to the issuance of an operating permit for boiler No. 4.~~

OK

Specific Condition No. 18

This condition would require U.S. Sugar to submit an application for an operation permit for Boiler No. 4 90 days prior to expiration of the construction permit. As the draft construction permit includes an expiration date of May 1, 1985, the operation permit application would be due February 1, 1985. Under the present schedule, construction of Boiler No. 4 may not even be completed by that date. We believe the construction permit for Boiler No. 4 should provide ample time for initial operation, debugging compliance testing and boiler efficiency testing. We therefore recommend the change set forth below. We also request that the expiration date for the Boiler No. 4 construction permit be changed to one year from the date of issuance of the final permit. This will ensure that initial testing can continue in the first part of the next year's season (1985-86) in the event construction delays or other problems preclude completion of all necessary testing before the end of the current season.

Recommended Language

let it expire
1/15/86
test must be
done by 11/15/85

> 18. The applicant will demonstrate compliance with the conditions of this construction permit and submit a complete application for a permit to operate to the District office ~~9~~60 days prior to the expiration of this construction permit. The applicant may continue to operate in

90

compliance with all terms of this construction permit until its expiration or until issuance of a permit to operate.

Specific Condition No. 19

This condition would specify a number of requirements to be imposed in the operation permit for Boiler No. 4. While we believe such requirements would be more appropriately addressed in the permitting process on an application for an operation permit, there is only one point in the proposed condition on which U.S. Sugar has serious concerns. The draft language would "require the scrubber to be operated at or above the pressure drop that existed during the compliance test." We understand the department's rationale in this requirement, but the language used provides absolutely no flexibility. If the particulate compliance test results were 0.05 lb/million Btu heat input with an average gas pressure drop of six inches, any pressure drop ever slightly below the six inch level would be a violation of the permit, even though the compliance test data would indicate a wide margin before the particulate emission limit is reached. We therefore recommend that disposition of the question of the range of allowable scrubber pressure drop levels be deferred until after the initial compliance test data is available.

Recommended Language

> 19. Any permit to operate issued for boiler No. 4 will limit operation to 182 days per season; require the scrubber to be operated at or above the pressure drop ~~that existed during the compliance test~~ determined to provide reasonable assurance of compliance with the applicable particulate emission limit; require as a minimum, annual particulate matter and visible emission tests; an annual operation report which will include the amount of oil burned at the plant to determine compliance with the limits on oil usage in this permit and the sulfur content of the residual oil purchased for the season; and a monthly summary of the scrubber parameters listed in Specific Condition No. 9.

10%

d. ~~If the emissions are not in compliance with the emission standards by the start of the 1985-86 season, U.S. Sugar must obtain a consent order, with appropriate financial penalties, from the Florida Department of Environmental Regulation and EPA, Region IV, before resuming commercial operations of boiler No. 4.~~ If, based upon the data and advice developed pursuant to this Specific Condition, no practicable method of achieving consistent compliance with the 0.15 lb/million Btu heat input particulate emission limit is identified within the BACT concept, the Department will consider modifying the limit to reflect a value that is attainable on a continuous basis, subject to the approval of the U.S. Environmental Protection Agency.

Delete

No way

In closing, I would like to express my appreciation for your time and consideration in working toward solutions to the issues raised by the Boiler No. 4 permit. If you have any questions or if you believe it would be helpful to hold another meeting in an effort to resolve any outstanding issues, please do not hesitate to call me.

Sincerely,

Peter C. Cunningham

Peter C. Cunningham

PCC/gs

cc: Bill Thomas
Willard Hanks
Cleve Holladay
Carol Forthman
Aryan Mayo
David Buff

PM
12-15-87
Tallahassee, FL

DER

DEC 17 1984

BAQM

HOPPING BOYD GREEN & SAMS

ATTORNEYS AND COUNSELORS

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STEVEN A. MEDINA
CAROLYN S. RAEPPLE

OF COUNSEL
W. ROBERT FOKES

December 14, 1984

HAND DELIVERED THIS DATE

Victoria J. Tschinkel, Secretary
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: U.S. Sugar Corporation
Clewiston Sugar Mill Boiler No. 4
Request for Extension of Time for Filing on Permit No. AC26-80930

Dear Secretary Tschinkel:

On November 9, 1984, staff of the Department's Bureau of Air Quality Management provided to Ed Barber of the Florida Sugar Cane League, the Department's intent to issue Air Construction Permit No. AC 26-80930 for U. S. Sugar Corporation's Clewiston Sugar mill Boiler No. 4, along with a draft permit, Technical Evaluation, and Preliminary Determination. Pursuant to your Order dated December 3, 1984, U.S. Sugar Corporation has until December 14, 1984 to file a petition for administrative proceedings in regard to this proposed agency action.

I am writing on behalf of U.S. Sugar Corporation to request an extension of thirty (30) additional days, to and including January 13, 1985, for the filing of a petition for administrative proceedings on the Department's proposed agency action with respect to the air construction permit for Clewiston Boiler No. 4. This request is made pursuant to Florida Administrative Code Rule 17-103.070, which provides that a timely request for extension of time shall toll the running of the time period in which to file an appropriate petition. As good cause for granting this extension of time for filing, U.S. Sugar Corporation shows the following:

1. The draft permit issued by the Department contains twenty (20) specific conditions that are both extensive and technical. After its initial review of the draft permit, U.S. Sugar Corporation has determined that certain of these

specific conditions are not entirely acceptable and that other specific conditions would benefit from clarification.

2. Representatives of U.S. Sugar Corporation have met with Mr. Clair Fancy and other members of the Department's Central Air Permitting Section to discuss U.S. Sugar Corporation's concerns regarding the draft permit and potential revisions to certain of the draft permit conditions.

3. A letter explaining each of U.S. Sugar Corporation's objections to the draft permit and recommending language changes is presently being prepared and will be submitted in the next few days.

4. Grant of this extension request will allow the parties an opportunity to informally discuss U.S. Sugar Corporation's concerns regarding the draft permit in the hope of reaching a mutually acceptable resolution of those concerns without the need for initiation of formal administrative proceedings in this matter..

I hereby certify that I have spoken with Carol Forthman, Assistant General Counsel for the Department, and with Clair Fancy, Deputy Chief of the Bureau of Air Quality Management, and that both are in agreement with the grant of this request.

Accordingly, I respectfully request that you formally extend the time for filing of a petition for administrative proceedings regarding the Department's Intent to Issue Air Construction Permit No. AC26-80930 for U.S. Sugar Corporation Clewiston Boiler No. 4 to and including January 13, 1985. A suggested form of order by which the extensions may be granted is offered as Exhibit "A" hereto.

Sincerely,

Peter C. Cunningham

Peter C. Cunningham

PCC/gs
Attachment

cc: Carol Forthman, Esquire
Clair Fancy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

DER
DEC 17 1984
BAQM

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0876, FLORIDA STATUTES

License (Permit, Certification) Application No. AC26-80930

Applicant's Name: A.R. Mayo, Vice President
U.S. Sugar Corporation

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above reference license (permit, certification) application, the applicant hereby with full knowledge and understanding of (his) (her) (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florida Statutes. Said waiver is made freely and voluntarily by the applicant, is in (his) (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 13th day of January 1985.

The undersigned is authorized to make this waiver on behalf of the applicant.

Peter C. Cunningham
Signature

Peter C. Cunningham
Please Type Name of Signee

December 14, 1984
Date

Sworn to and subscribed before me this 14th day of December 1984.

Gail Steel
Notary Public
My Commission Expires:

Notary Public, State of Florida
My Commission Expires March 6, 1988
Bonded Thru Troy Fain Insurance, Inc.

Protecting Florida and Your Quality of Life

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

U.S. SUGAR CORPORATION, Petitioner, vs. STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION, Respondent.	)	OGC FILE NO. ________ PERMIT NO. AC26-80930

ORDER ON REQUEST FOR EXTENSION OF TIME
TO FILE PETITION FOR ADMINISTRATIVE PROCEEDINGS

This cause has come before me upon receipt of a request made by U. S. Sugar Corporation for an extension of time to file a petition for administrative proceedings in the subject file. The request, made pursuant to Section 17-103.070, Florida Administrative Code, seeks an extension until and including January 13, 1985.

The applicant having discussed the request for extension with the Department and there being no objection to the granting of the extension,

IT IS ORDERED:

The applicant shall have until and including January 13, 1985 to file a petition for administrative proceedings in the subject file.

DONE AND ORDERED this ______ day of December, 1984 in Tallahassee, Florida.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL
REGULATION

____
Victoria J. Tschinkel
Secretary

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301
(904) 488-4805

DER
DEC 17 1984
BAQM

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

November 26, 1984

Mr. Max Osceola
Superintendent of Seminole Agency
Bureau of Indian Affairs
Department of the Interior
6075 Sterling Road
Hollywood, Florida 33024

Dear Mr. Osceola:

RE: Preliminary Determination - U.S. Sugar Corporation
Bagasse Boiler No. 4

I wish to bring to your attention that United States Sugar Corporation proposes to modify its existing facilities in Hendry County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction.

Please also be aware that the attached Public Notice announcing the preliminary determination, the availability of pertinent information for public scrutiny and the opportunity for public comment was recently published in the Clewiston News. This notice has been mailed to you for your information and in accordance with regulatory requirements. You need take no action unless you wish to comment on the proposed construction. If you have any questions, please feel free to call Mr. Bill Thomas or myself at (904)488-1344.

Sincerely,

CH Fancy

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/pa
Enclosure

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

DEPARTMENT OF ENVIRONMENTAL REGULATION
STATE OF FLORIDA

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

November 26, 1984

Mr. Wayne E. Daltry
Southwest Florida Regional
Planning Council
2121 West First Street
Ft. Myers, Florida 33902

Dear Mr. Daltry:

RE: Preliminary Determination - U.S. Sugar Corporation
Bagasse Boiler No. 4

I wish to bring to your attention that United States Sugar Corporation proposes to modify its existing facilities in Hendry County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction.

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Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/pa
Enclosure

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

November 26, 1984

Honorable Fred C. Sikes
Mayor, City of Clewiston
Post Office Box 698
Clewiston, Florida 33440

Dear Mayor Sikes:

RE: Preliminary Determination - U.S. Sugar Corporation
Bagasse Boiler No. 4

I wish to bring to your attention that United States Sugar Corporation proposes to modify its existing facilities in Hendry County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction.

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Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/pa
Enclosure

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

November 26, 1984

Hendry County Board of County
Commissioners
Post Office Box 38
LaBelle, Florida 33935

Dear Commissioners:

RE: Preliminary Determination - U.S. Sugar Corporation
Bagasse Boiler No. 4

I wish to bring to your attention that United States Sugar Corporation proposes to modify its existing facilities in Hendry County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction.

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Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/pa
Enclosure

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

November 26, 1984

Mr. Ron Fahs
State A-95 Coordinator
Florida State Planning and
Development Clearinghouse
Office of Planning and Budget
The Capitol
Tallahassee, Florida 32301

Dear Mr. Fahs:

RE: Preliminary Determination - U.S. Sugar Corporation
Bagasse Boiler No. 4

I wish to bring to your attention that United States Sugar Corporation proposes to modify its existing facilities in Hendry County, Florida, and that emissions of air pollutants will thereby be increased. The Florida Department of Environmental Regulation, under the authority delegated by the U.S. Environmental Protection Agency, has reviewed the proposed construction under Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21) and reached a preliminary determination of approval, with conditions, for this construction.

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Sincerely,

C. H. Fancy

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/pa
Enclosure

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
SUITE 420, LEWIS STATE BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

CARLOS ALVAREZ
BRIAN H. BIBEAU
WILLIAM L. BOYD, IV
PETER C. CUNNINGHAM
WILLIAM H. GREEN
WADE L. HOPPING
RICHARD D. MELSON
WILLIAM D. PRESTON
GARY P. SAMS
ROBERT P. SMITH, JR.

ELIZABETH C. BOWMAN
RICHARD S. BRIGHTMAN
FRANK E. MATTHEWS
STEVEN A. MEDINA
CAROLYN S. RAEPPLE

OF COUNSEL
W. ROBERT FOKES

November 21, 1984

HAND DELIVERED THIS DATE

DER
NOV 21 1984
BAQM

Victoria J. Tschinkel, Secretary
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: U.S. Sugar Corporation
Clewiston Sugar Mill Boiler No. 4
Request for Extension of Time for Filing on Permit No. AC26-80930

Dear Secretary Tschinkel:

On November 9, 1984, staff of the Department's Bureau of Air Quality Management provided to Ed Barber of the Florida Sugar Cane League the Department's intent to issue Air Construction Permit No. AC 26-80930 for U.S. Sugar Corporation's Clewiston Sugar Mill Boiler No. 4, along with a draft permit, Technical Evaluation, and Preliminary Determination. Pursuant to the intent to issue and Section 17-103.155, Florida Administrative Code, U.S. Sugar Corporation has fourteen (14) days from the date of receipt of the Department's letter of intent in which to file a petition for administrative proceedings in regard to this proposed agency action.

I am writing on behalf of U.S. Sugar Corporation to request an extension of time, to and including December 14, 1984, for the filing of a petition for administrative proceedings on the Department's proposed agency action with respect to the air construction permit for Clewiston Boiler No. 4. This request is made pursuant to Section 17-103.070, Florida Administrative Code, which provides that a timely request for extension of time shall toll the running of the time period in which to file an appropriate petition. As good cause for granting this extension of time for filing, U.S. Sugar Corporation shows the following:

1. The draft permit issued by the Department contains twenty (20) specific conditions that are both extensive and technical. After its initial review of the draft permit, U.S. Sugar Corporation has determined that certain of these

specific conditions are not entirely acceptable and that other specific conditions would benefit from clarification.

2. I have attempted to contact Mr. Clair Fancy and Mr. Bill Thomas, who are the Department staff most involved in this permitting effort, but have as yet been unable to discuss U.S. Sugar Corporation's concerns regarding the draft permit due to their unavailabilty.

3. The engineering consultant who assisted U.S. Sugar Corporation in this permitting effort has been out of the country since the draft permit was received, and thus U.S. Sugar has been unable to have him review the Department's proposed action.

4. Grant of this extension request will allow the parties an opportunity to informally discuss U.S. Sugar Corporation's concerns regarding the draft permit in the hope of reaching a mutually acceptable resolution of those concerns without the need for initiation of formal administrative proceedingss in this matter.

I hereby certify that I have spoken with Carol Forthman, Assistant General Counsel for the Department, and that she is in agreement with the grant of this request.

Accordingly, I respectfully request that you formally extend the time for filing of a petition for administrative proceedings regarding the Department's Intent to Issue Air Construction Permit No. AC 26-80930 for U.S. Sugar Corporation Clewiston Boiler No. 4 to and including December 14, 1984. A suggested form of Order by which this extension may be granted is offerred as Exhibit "A" hereto.

Respectfully submitted,

Peter C. Cunningham

Peter C. Cunningham

PCC/gs

cc: Carol Forthman, Esquire
Clair Fancy
Bill Thomas
Willard Hanks
Aryan Mayo

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

U.S. SUGAR CORPORATION, Petitioner, vs. STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION, Respondent.	)	OGC FILE NO. _______ PERMIT NO. AC26-80930

ORDER ON REQUEST FOR EXTENSION OF TIME
TO FILE PETITION FOR ADMINISTRATIVE PROCEEDINGS

This cause has come before me upon receipt of a request made by U. S. Sugar Corporation for an extension of time to file a petition for administrative proceedings in the subject file. The request, made pursuant to Section 17-103.070, Florida Administrative Code, seeks an extension until and including December 14, 1984.

The applicant having discussed the request for extension with the Department and there being no objection to the granting of the extension,

IT IS ORDERED:

The applicant shall have until and including December 14, 1984 to file a petition for administrative proceedings in the subject file.

DONE AND ORDERED this ______ day of November, 1984 in Tallahassee, Florida.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL
REGULATION

____
Victoria J. Tschinkel
Secretary

EXHIBIT "A"

UNITED STATES SUGAR CORPORATION
P. O. Drawer 1207
CLEWISTON, FLORIDA 33440

November 19, 1984

Mr. C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management
Twin Towers Office Building
2600 Blairstone Road
Tallahassee, Florida 32301-8241

Dear Mr. Fancy:

We are enclosing Affidavit of Publication certifying that the Notice of Proposed Agency Action forwarded to us with your November 9, 1984 letter was duly published in the advertising section of the November 14, 1984 issue of the Clewiston News.

Sincerely,

UNITED STATES SUGAR CORPORATION

A. R. Mayo

A. R. Mayo
Vice President, Sugar Houses

ARM:jt

Enclosure

The Clewiston News

Published Weekly Clewiston, Florida

AFFIDAVIT OF PUBLICATION

State of Florida
County of Hendry

Before the undersigned authority, personally appeared James A. Jones, Jr., who on oath says that he is the General Manager of the Clewiston News, a weekly newspaper published at Clewiston in Hendry County, Florida, that the attached copy of advertisement, being a Notice in the matter of Notice of Proposed Agency Action Permit Application to build boiler in the Court, was published in said newspaper in the issues of Nov. 14, 1984

Affiant further says that the said Clewiston News is a newspaper published at Clewiston, in said Hendry County, continuously published in said Hendry County, Florida each week, and has been entered as a second class mail matter at the post office in Clewiston, in said Hendry County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Sworn to and subscribed before me this 14th day of November, A.D. 19 84

Sherry M. Davis
Notary Public.

Notary Public, State of Florida at Large
My Commission Expires My commission expires July 27, 1986
Bonded thru Lawyers Surety Corp.

SHERRY M. DAVIS NOTARY PUBLIC STATE OF FLORIDA

State of Florida
Department of Environmental Regulation
Notice of Proposed Agency Action on Permit Application

The Department gives notice of its intent to issue a permit to United States Sugar Corporation to construct a 545.5 million Btu/hr bagasse/No. 6 residual oil fired boiler at their existing intersection of W.C. Ownes Avenue and Clewiston Street, Clewiston, Florida.

The boiler will use bagasse and No. 6 residual oil for fuels. Bagasse will be the primary fuel. Particulate matter emissions will be controlled with a wet impingement scrubber. Sulfur dioxide emissions will be limited by restrictions on the quantity of residule oil burned and its sulfur content. Emissions of other air pollutants will be controlled by good firing and operational practices.

Limitations to restrict emissions were established by a Best Available Control Technology determination. These limits are summarized below:

Particulate matter: 0.150 lb/million Btu for bagasse fuel, 0.10 lb/million Btu for residual oil fuel, 179 TPY Maximum.

Sulfur Dioxide: Maximum of 1.5 percent sulfur in residual oil, 350 TPY maximum.

VOC, NOx and CO, Good operating practice

These emissions will not cause an ambient air violation or exceed the allowable PSD increment or violate any state or federal regulation. The ambient air impact of these emissions, in percent of increment consumed, are listed below:

Pollutant: Particulate Matter; Annual: 2; 24hr: 16; 3hr: NA.

Pollutant: Sulfur Dioxide; Annual: 15; 24 hr.: 57; 3 hr.: 31.

Persons whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Twin Towers Office-Building, Tallahassee, Florida 32301, within fourteen (14) days of publication of this notice. Failure to file a request for hearing within this this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statues.

If a petition is filed the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this preliminary statement. Therefore, persons who may not object to the proposed agency action may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Model Rule 28-5.207 at least five (5) days before the final hearing and be filed with the hearing officer, if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009 Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahasse, Florida 32301. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The application is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Fl. 32301

Department of Environmental Regulation
South Florida District
2269 Bay Street
Fort Myers, Fl. 33901

Municipal Library
530 South Main St.
Belle Glade, Fl. 33430

Any person may send written comments on the proposed action to Mr. Clair Fancy at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination.

CN84-548
November 14, 1984

PM
11-15-84
Clewiston, FL

UNITED STATES SUGAR CORPORATION

Post Office Drawer 1207 Clewiston, Florida 33440
Telephone: (813) 983-8121 Telex: 510-952-7753

November 15, 1984

Mr. C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management
Twin Towers Office Building
2600 Blairstone Road
Tallahassee, Florida 32301-8241

Dear Mr. Fancy:

In accordance with your letter of November 9, 1984, addressed to Mr. A. R. Mayo and our phone conversation on November 13, 1984, the attached advertisement was published on Wednesday, November 14, 1984, in the legal advertising section of the Clewiston News, a newspaper of general circulation in Hendry County.

Should you have any questions regarding this matter please feel free to contact me. With best regards, I am

Sincerely,

Robert E. Coker
Director Community Affairs

REC/at

cc: Mr. A. R. Mayo
Mr. Robert C. Lee

State of Florida
Department of Environmental Regulation
Notice of Proposed Agency Action on Permit Application

The Department gives notice of its intent to issue a permit to United States Sugar Corporation to construct a 545.5 million Btu/hr bagasse/No. 6 residual oil fired boiler at their existing intersection of W.C. Ownes Avenue and Clewiston Street, Clewiston, Florida.

The boiler will use bagasse and No. 6 residual oil for fuels. Bagasse will be the primary fuel. Particulate matter emissions will be controlled with a wet impingement scrubber. Sulfur dioxide emissions will be limited by restrictions on the quantity of residule oil burned and its sulfur content. Emissions of other air pollutants will be controlled by good firing and operational practices.

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VOC, NOx and CO, Good operating practice

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Department of Environmental Regulation
Bureau of Air Quality Management
2600 Blair Stone Road
Tallahassee, Fl. 32301

Department of Environmental Regulation
South Florida District
2269 Bay Street
Fort Myers, Fl. 33901

Municipal Library
530 South Main St.
Belle Glade, Fl. 33430

Any person may send written comments on the proposed action to Mr Clair Fancy at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination.

CN84-548
November 14, 1984

PM
11-14-84
Clewiston, FL

UNITED STATES SUGAR CORPORATION

P. O. Drawer 1207
CLEWISTON, FLORIDA *33440*

DER
NOV 16 1984
BAQM

November 12, 1984

Mr. C. H. Fancy, Deputy Chief
Bureau of Air Quality Management
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida

Dear Mr. Fancy:

This will acknowledge receipt of your letter with the technical evaluation, preliminary determination, and proposed permit to construct our bagasse boiler #4 which you kindly sent with Mr. Ed Barber of the Florida Sugar Cane League.

Sincerely,

UNITED STATES SUGAR CORPORATION

A. R. Mayo
A. R. Mayo
Vice President, Sugar Houses

ARM:jt

AC26-80930
PSD-FL-100

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

November 9, 1984

Municipal Library
530 South Main Street
Belle Glade, Florida 33430

Attention: Librarian

RE: Preliminary Determination - U.S. Sugar Corporation
Bagasse Boiler No. 4

The Bureau of Air Quality Management needs to make the enclosed information available for public inspection pursuant to Federal Prevention of Significant Deterioration Regulations (40 CFR 52.21, Paragraph (q)). A notice directing people to the library will be published in a local newspaper in the near future.

The information must be available upon request for a period of at least 30 days from the notice date. At the end of the period, we will forward to you a Final Determination on the permit application which must be available for an additional 30 days.

We appreciate your help in providing this valuable public service. Should you have any questions, please call me at (904)488-1344.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/pa

Enclosure

AC 26-20433

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

November 9, 1984

Mr. James T. Wilburn, Chief
Air Management Branch
Air & Waste Management Division
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Wilburn:

RE: Preliminary Determination - U.S. Sugar Corporation
Bagasse Boiler No. 4

Enclosed for your review and comment are the Public Notice and Preliminary Determination for the modification of the above referenced Prevention of Significant Deterioration permit for United States Sugar Corporation.

Please inform my office at (904)488-1344 if you have comments or questions regarding this determination.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/pa

Enclosure

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
SUITE 420, LEWIS STATE BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

CARLOS ALVAREZ
BRIAN H. BIBEAU
WILLIAM L. BOYD, IV
PETER C. CUNNINGHAM
WILLIAM H. GREEN
WADE L. HOPPING
RICHARD D. MELSON
WILLIAM D. PRESTON
GARY P. SAMS
ROBERT P. SMITH, JR.

ELIZABETH C. BOWMAN
RICHARD S. BRIGHTMAN
FRANK E. MATTHEWS
STEVEN A. MEDINA
CAROLYN S. RAEPPLE

OF COUNSEL
W. ROBERT FOKES

September 24, 1984

DER
SEP 24 1984
BAQM

Mr. Clair Fancy
Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: U. S. Sugar Corporation
Clewiston Mill Boiler No. 4
Air Construction Permit Application

Dear Mr. Fancy:

Enclosed please find a letter from A. R. Mayo, Vice-President of U.S. Sugar Corporation, in reply to your letter of August 31, 1984 requesting additional information on the referenced air construction permit application. On behalf of U. S. Sugar Corporation, we thank you and your staff for taking the time to meet with us on September 12, 1984 to discuss the status of the permit application. We would also like to take this opportunity to respond to the questions raised at that meeting.

Your staff expressed a a desire for additional assurances concerning the design and performance of the impingement scrubber proposed for boiler No. 4 by U. S. Sugar Corporation. Two questions seemed to be of paramount interest: (1) the extent to which the design of the proposed scrubber differs from the Joy Manufacturing Company design; and (2) whether changes in design parameter or other adjustments will be made to the proposed scrubber to optimize its efficiency. You stated your belief that the Best Available Control Technology (BACT) determination for Boiler No. 4 will result in a particulate emission limit of no greater than 0.15 pounds per million Btu heat input, and your staff evidenced concern about the ability of the proposed scrubber to achieve that limit. The Department's experience with other sugar companies and sugar mills also came up as a factor in your attitude toward the Boiler No. 4 permit application.

In regard to the last point, we would again urge that you distinguish U.S. Sugar Corporation from other sugar companies with which the Bureau of Air Quality Management may have had prior experiences that you view as unsatisfactory. We believe it is unfair and inappropriate to allow review of the Boiler No. 4 permit application of U.S. Sugar Corporation to be adversely affected by such experiences, rather than being evaluated on its own merits.

To the extent that past history is relevant to the Boiler No. 4 application, focus should be on the record of U.S. Sugar Corporation. As you know, Bryant Mill Boiler No. 5, this Company's most recently-constructed boiler, is equipped with an impingement scrubber of the "Joy" design. It has generally complied with the 0.15 pound per million Btu heat input particulate emission limit imposed as BACT under its Department permit. Therefore, we would expect that the Department's experience with the Bryant Boiler No. 5 would cast a favorable light upon the currently pending permit application.

We have followed up on your questions regarding the apparent failure of another sugar company to provide information regarding particulate emission levels measured and scrubber performance at a recently constructed boiler. We have learned that the company in question sent what it believes is the appropriate information to you more than a month ago. Unfortunately, that package was apparently lost in the Department's mailroom and never got to you. A second copy of the information is being provided to you under separate cover in case your original cannot be located.

In regard to the pending application for Clewiston Mill Boiler No. 4, we acknowledge that in addition to providing reasonable assurance that a proposed source will comply with applicable emission limiting standards (in this case, 0.2 pounds per million Btu heat input), a PSD permit applicant must also provide reasonable assurance that the proposed emission control technology represents BACT for the source. The design and performance of the scrubber proposed for Boiler No. 4 are fully described in the extensive information U.S. Sugar Corporation has previously submitted. The original application filed in February 1984 also included an evaluation of various alternative emission control technologies as required for the BACT determination. In response to the Department's questions, U.S. Sugar re-evaluated certain alternative technologies as discussed in the submittal dated June 1, 1984. These analyses each concluded that the proposed impingement scrubber represents BACT for Boiler No. 4.

The Department has never identified an alternative technology that, on the basis of applicable performance testing data, has been shown to be capable of achieving equivalent or better particulate emission control for Boiler No. 4 than the proposed scrubber, taking into account energy, environmental and economic impacts and other costs, as is required in a BACT determination. It is therefore difficult to understand the Department's repeated questioning regarding the BACT technology for Boiler No. 4 proposed by U.S. Sugar Corporation.

In any case, the appropriate BACT emission limit can be determined only after the emissions control system representing BACT has been specified. Nonetheless, you will recall that in response to the Department's concerns on this point, U.S. Sugar Corporation agreed in its June 1, 1984 submittal to accept a BACT emission limit of 0.15 pounds per million Btu heat input, a significantly lower limit than that proposed in the original permit application (0.2 pounds per million Btu heat input.)

U.S. Sugar Corporation's concession on this point was accompanied by a decision to significantly increase the size of the proposed scrubber, so that it will be considerably larger than the scrubber installed at Bryant Boiler No. 5, a boiler of similar capacity which has demonstrated compliance with the 0.15 pound per million Btu heat input emission limit with reasonable consistency. Consequently, U.S. Sugar Corporation believes that it has provided the Department with reasonable assurance that the proposed boiler, with the larger-sized scrubber, will comply with a 0.15 pound BACT emission limit.

Your staff also expressed an interest in whether increases in the pressure drop across the scrubber or changes in other design parameters might further optimize scrubber efficiency. The pressure drop issue was addressed in the package submitted to the Department on June 1, 1984. U.S. Sugar Corporation has again considered the question of scrubber efficiency, and has concluded that there are no additional design changes that could reasonably be expected to further optimize scrubber performance within the BACT concept. This conclusion was made on the basis of U.S. Sugar Corporation's unparalleled degree of experience with the operation of impingement scrubbers at bagasse boilers. In the event that the proposed boiler and scrubber do not achieve the expected level of performance, U.S. Sugar Corporation will be more than willing to review any available operating procedures or adjustments that might be utilized to further optimize particulate emission control.

A final area of interest identified by your staff concerned the extent to which the proposed scrubber design differs from the "original" Joy Manufacturing Company design. This question was addressed in both the June 1, 1984 and the July 30, 1984 submittals to the Department. In addition to that information, U.S. Sugar Corporation has provided, as an attachment to Mr. Mayo's enclosed letter, a statement from Mr. R. E. Burchard, a registered Professional Engineer, regarding his evaluation of the design parameters of the proposed scrubber as compared to scrubbers either built or engineered by Joy Manufacturing Company. As stated in Mr. Mayo's letter, Mr. Burchard will also be responsible for assuring that the scrubber design is adhered to during its construction and erection. If you have questions concerning the scrubber design or construction, we would request that you contact Mr. Burchard directly at (813) 983-8121.

As you are aware, the sugar cane harvesting season is rapidly approaching. Thanks to the cooperation of the Department in entering into a Consent Order, the construction of Boiler No. 4 has not been delayed pending completion of the permitting process. At our September 12th meeting, you indicated that the Department would be willing to proceed with this permitting in an expedited schedule. We request that you do so at this time in order to achieve the mutual purpose underlying the Consent Order of allowing the new boiler to commence operation for the upcoming season.

If you or your staff have further questions, please do not hesitate to call Mr. Burchard or either of us. Your consideration in this matter is much appreciated.

Sincerely,

William H. Green
Peter C. Cunningham

Counsel for U.S. Sugar Corporation

WHG/PCC/gs
Enclosures

cc: Bill Thomas
Willard Hanks
Ed Palagyi
Nancy Wright, Esquire
Carol Forthman, Esquire

UNITED STATES SUGAR CORPORATION
P. O. Drawer 1207
CLEWISTON, FLORIDA 33440

September 19, 1984

Mr. C. H. Fancy, P.E., Deputy Chief
Bureau of Air Quality Management
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301-8241

Dear Mr. Fancy:

This is in response to your letter of August 31, 1984 requesting that we expand on your answers to your questions of June 22, referring specifically to questions 2, 4 and 5:

2) As we stated in our letter of July 30, only two oil burners with two guns each are going to be installed in this boiler. The windboxes that will be installed can accommodate these two burners only. No additional windboxes capable of accommodating additional burners will be installed.

4) The installation of this boiler, as we indicated in our reply of June 30, will significantly reduce fugitive dust emissions from the storage pile since it will be fed with bagasse coming directly from the milling tandem more than 95% of the time. This bagasse in the past has gone to outside storage and then retrieved to be trucked to the Quaker Oats Company in Belle Glade, Florida. In each of the last two years some 40,000 tons of bagasse were thus handled. With the new boiler we estimate that no more than 10% of that amount will be so stored, thus reducing fugitive dust emission significantly.

   The spraying of water on bagasse is not practical when retrieving since this would significantly affect its combustibility in the boiler and thus create increased particulate emissions from this boiler. Also since the bagasse is significantly compacted by its own weight and the wheels of the payloaders while in the pile, this will reduce the fugitive dust very substantially at the time of reclaiming from the pile.

5) As we stated in our letter of reply of June 30, 1984, there are no difference in design between the seven scrubbers built or engineered by the Joy Manufacturing Co. for U. S. Sugar Corporation and the proposed scrubber except as to size, and for cleaning doors, improved overflows and other external improvements made to increase the reliability of operation

and ease of maintenance, none of which affects the operation of the scrubber.

Enclosed as you indicated, we are furnishing statement by our in-house professional engineer to the extent that this scrubber design has followed the same design parameters used on several of our scrubbers which were built or fully engineered by the Joy Manufacturing Co. for our two plants. Mr. R. E. Burchard will also be responsible for compliance with the design during its construction and erection.

As you know we have increased the size of the scrubber for this boiler to one size larger than was used on boiler No. 5 at Bryant which is of similar capacity and which has been able to meet with some degree of consistency the .15#/MBTU limit. This was done to demonstrate our willingness to do what is reasonably possible to go along with your Department in trying to achieve better collection efficiency from this scrubber and in the anticipation that it will provide the slight margin for consistent compliance with that emission limit.

Very truly yours,

UNITED STATES SUGAR CORPORATION

A. R. Mayo

A. R. Mayo
Vice President, Sugar Houses

ARM:jt
Enclosure

cc: Mr. Peter Cunningham
Mr. David Buff
Mr. David Knowles

September 19, 1984

Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301-8241

Gentlemen:

This is to state that I have reviewed the principal design parameters of the proposed scrubber for Clewiston Mill Boiler No. 4. I compared design gas velocities at the gap or venturi section, inner chamber and spin vane separator with those of seven other boiler scrubbers in our two plants which were either built or fully engineered by the Joy Manufacturing Company. I found the velocities to be all within the range found on the factory manufactured or engineered ones and with a gap or venturi velocity which closely matches that of the apparently best performing scrubbers on these two plants.

I also compared separator design, drain backs, venturi or gap configuration and other related features and find no significant varation from factory design.

Based on the above study it is to be expected that the proposed scubber will give similar performances.

Very truly yours,

R. E. Burchard, P.E.

R. E. BURCHARD
CERTIFICATE
No. 22443
STATE OF FLORIDA
REGISTERED ENGINEER

REB:t

No. 0156555

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

SENT TO Mr. A. R. Mayo		
STREET AND NO.		
P.O., STATE AND ZIP CODE		
POSTAGE		$
CONSULT POSTMASTER FOR FEES	CERTIFIED FEE	¢
OPTIONAL SERVICES	SPECIAL DELIVERY	¢
	RESTRICTED DELIVERY	¢
RETURN RECEIPT SERVICE	SHOW TO WHOM AND DATE DELIVERED	¢
	SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY	¢
	SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
	SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES		$
POSTMARK OR DATE 8/31/84		

PS Form 3800, Apr. 1976

PS Form 3811, Jan. 1979

RETURN RECEIPT, REGISTERED, INSURED AND CERTIFIED MAIL

SENDER: Complete items 1, 2, and 3.
Add your address in the "RETURN TO" space on reverse.

1. The following service is requested (check one.)
   - [X] Show to whom and date delivered........ ¢
   - [ ] Show to whom, date and address of delivery.. ¢
   - [ ] RESTRICTED DELIVERY
     Show to whom and date delivered........ ¢
   - [ ] RESTRICTED DELIVERY.
     Show to whom, date, and address of delivery.$ ____

   (CONSULT POSTMASTER FOR FEES)

2. ARTICLE ADDRESSED TO:
   Mr. A. R. Mayo
   P. O. Drawer 1207
   Clewiston, FL 33440

3. ARTICLE DESCRIPTION:

REGISTERED NO.	CERTIFIED NO.	INSURED NO.
	0156555	

(Always obtain signature of addressee or agent)

I have received the article described above.
SIGNATURE ☐Addressee ☐Authorized agent

4. DATE OF DELIVERY POSTMARK

CLEWISTON, FL SEP 4 1984 USPO

5. ADDRESS (Complete only if requested)

6. UNABLE TO DELIVER BECAUSE: CLERK'S INITIALS

☆GPO : 1979-300-459

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

August 31, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
United States Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

The department has reviewed your July 30, 1984, reply to our June 22, 1984, letter requesting additional information on your proposed boiler No. 4. Before we consider your application complete, we request you expand on several of your answers to our June 22 questions. Specifically, please answer the following questions. The question numbers are the same as used in our June 22, 1984, letter.

2. What will prevent more than two oil guns from being placed and operated in the proposed boiler? A permit restriction alone does not provide reasonable assurance that only two guns will be used. Welding the extra oil gun opening shut or some other physical restriction that would prevent extra oil guns from being installed in the boiler would provide assurance that only two guns would be used in the boiler.

4. Does the moisture in the bagasse in the inactive storage pile remain the same, increase because of rain, or decrease because of evaporation? We are aware that the average moisture content of the bagasse in the mills is reported to be 55 percent. However, we are not sure what the percent moisture in the bagasse in storage is. If the moisture evaporates from the bagasse during storage, are any precautions taken to minimize fugitive dust emission such as spraying water on the piles when it is reclaimed?

5. We note the inclusion of the Joy Manufacturing Company information in the application. What are the differences, in detail, between the Joy design and the scrubber which you propose to install? We have been told that: the Collection Efficiency vs Particle Size table; February 8, 1974, letter that guaranteed scrubber performance; and,

now, the drawing of the scrubber in the brochure does not represent the proposed Joy designed scrubber. Has a Professional Engineer, registered to practice in Florida, reviewed the proposed scrubber design and given you assurance that it can comply will the air pollution control regulations of Florida?

Please respond to this request at your earliest convenience so that we can resume processing your application. Should you need clarification on any question in this letter, please write me or call Willard Hanks at (904)488-1344.

Sincerely

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/WH/s

cc: D. Knowles
D. Buff
P. Cunningham

UNITED STATES SUGAR CORPORATION

P. O. Drawer 1207

CLEWISTON, FLORIDA 33440

July 30, 1984

DER

AUG 1 1984

BAQM

Mr. C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

RE: U.S.S.C. Air Permit Application
Clewiston Mill Boiler No. 4
Hendry County

Dear Mr. Fancy:

Please find below our responses to your letter of June 22, 1984, requesting additional information on the air permit application for proposed Boiler No. 4 at the Clewiston Mill. Each of the numbered paragraphs addresses your question of the corresponding number.

1. We recognize that your question No. 1 concerns the potential applicability of the Subpart D NSPS resulting from "reconstruction" as defined at 40 CFR, Sec. 60.15. We believe this analysis is uncesssary in that proposed Boiler No. 4 will not have the capacity to burn more than 250 million Btu per hour of fossil fuel. As explained in our previous submittals and reiterated in paragraph 2, below, Boiler No. 4 will not be equipped to burn more than 250 million Btu per hour of oil or any other fossil fuel. We therefore contend that there is no reason to engage in the difficult and time-consuming task of attempting to determine the costs for various equipment called for in your question No. 1. We would point out, however, that U. S. Sugar's entire budget for the purchase and installation of Boiler No. 4 and associated equipment (including the scrubber) is approximately $1.5 million, while the total cost of a new bagasse boiler of similar size recently purchased and installed by another sugar company exceeded $6 million.

2. The original boiler installation at Rockford, Illinois, had four (4) oil burners containing each two (2) Peabody Engineering Corporation oil guns. All four burners were located on the front of the boiler. We are proposing to use only two (2) of these burners to be relocated on the left hand side of the boiler. The P.E.C. capacity curve (attached) indicates a flow of 3000#/hr. for the size "D" guns with which this boiler will be equipped at 100 psig which will be the pressure setting of the relief valve adjacent to the burners. This will result in a total combined maximum flow of oil of 12,000#/hr. for the four oil guns, two each per burner, in this boiler which is equivalent to 222 MBTU/hr. heat input with oil of 18,500 BTU/#.

The installation of additional oil burning capacity, exceeding 250 MBTU is precluded by the permit conditions limiting this boiler fossil fuel usage to this level.

We are enclosing the oil flow diagram for this boiler as requested.

3. The percent moisture in the bagasse is determined at our laboratory on a moisture teller machine supplied by Harry W. Dietert Co. Bagasse from the last two mills is collected approximately every four hours. One hundred (100) grams are weighed in a basket and dried in the moisture teller until constant weight is obtained (approximately 30 minutes or longer). The difference in weight between the 100 grams and the constant weight obtained is the moisture content of the bagasse sample.

4. Normally the boiler will not be operating reclaiming bagasse from the storage pile. The average moisture content of the bagasse is about 55% and this high moisture content will minimize any fugitive emissions of dust due to bagasse handling. Also the conveyor used to reclaim the bagasse from the pile has a cover to minimize, as much as possible, any fugitive dust. Please note that fugitive particles reduction by this installation will be accomplished since most of the bagasse will be directly conveyed from the mill to the boiler and not stored and then retrieved for later transportation to Quaker Oats as was done in the past.

5. Our proposed scrubber, size 200, does not have an adjustable weir along the bottom edge of the venturi. None of our existing scrubber installations have one, but instead have a fixed gap as the original Joy Manufacturing Company design calls for. The drawing on Page C-3 of Attachment "C" to the original application is merely a pictorial representation of a scrubber contained in a Joy Industrial Equipment Company sales brochure. The adjustable weir depicted in the drawing does not represent the actual design for any of the five scrubbers in operation at the Clewiston Mill which were fully engineered by the Joy Industrial Equipment Company.

We trust that these responses are sufficient for your purposes and that the Department will now be in a position to resume the processing of our permit application. If you have any further questions on our responses, please do not hesitate to contact our attorney Peter Cunningham at (904) 222-7500 or our environmental consultant, David Buff, at (904) 322-3318.

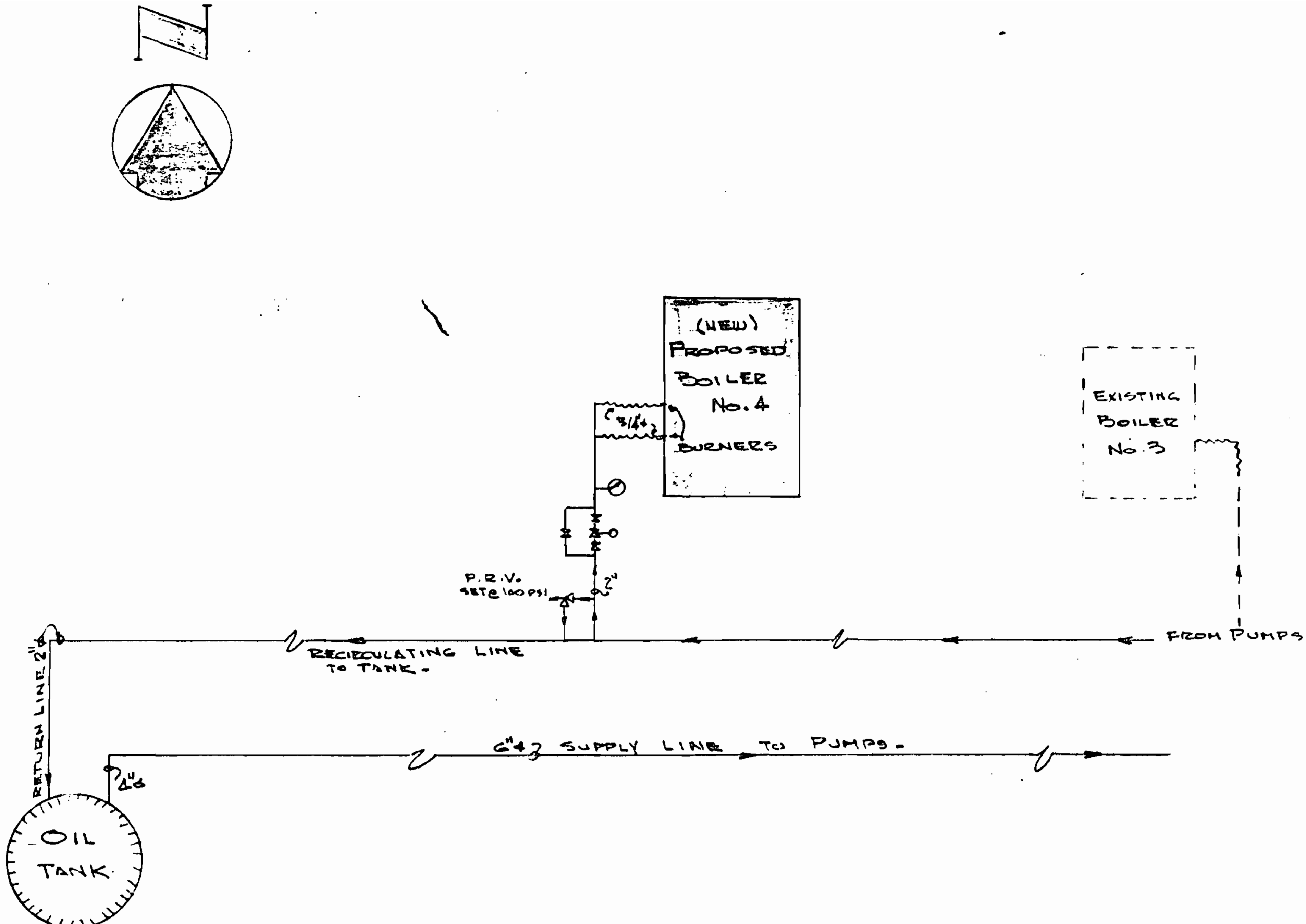
Sincerely,

UNITED STATES SUGAR CORPORATION

A. R. Mayo

A. R. Mayo
Vice President, Sugar Houses

ARM:jt
Enclosures
cc: Mr. Peter Cunningham
Mr. David Buff
Mr. David Knowles



NEW BOILER NO. 4

FUEL OIL SUPPLY

CLEWISTON SUGAR HOUSE

JULY 30-84

U.S.S.C.

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
SUITE 420, LEWIS STATE BANK BUILDING
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500

June 1, 1984

Mr. Clair Fancy
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: U.S. Sugar Corporation; Air Permit Application for Clewiston Mill Boiler No. 4, Hendry County

Dear Mr. Fancy:

Please find enclosed the responses of U.S. Sugar Corporation to your letter of March 3, 1984 requesting additional information on the air permit application for proposed Boiler No. 4 at the Clewiston Mill. The responses are numbered in accordance with the questions contained in your letter.

A preliminary draft of these responses was discussed with Bill Thomas, Ed Palagyi, Willard Hanks and Cleve Holladay. Based on that discussion, the responses have been revised in an attempt to fully address the points of interest. We trust that the enclosed information will complete the Boiler No. 4 permit application and allow the Department to resume its permit review.

Please do not hesitate to call me if you have any questions in regard to this matter.

Sincerely,

Peter C. Cunningham

Peter C. Cunningham

PCC/gs
Enclosure

cc: Bill Thomas
Ed Palagyi
Willard Hanks
Cleve Holladay
Nancy Wright, Esquire (w/o enclosures)

U.S. SUGAR CORPORATION'S RESPONSE TO DER QUESTIONS ON AIR PERMIT APPLICATION FOR PROPOSED BOILER NO. 4 AT CLEWISTON SUGAR MILL

Response to Questions 1 and 8

In regard to the NSPS applicability question, it should first be emphasized that proposed Boiler No. 4 was originally constructed in 1953, eighteen years before the triggering date for applicability of the Subpart D NSPS for Fossil-Fuel-Fired Steam Generators (August 17, 1971). Changes to an existing fossil-fuel-fired steam generating unit to accommodate the use of combustible materials other than fossil fuels do not make the unit subject to Subpart D. 40 CFR §60.40(b).

On the question of maximum fossil-fuel heat input, proposed Boiler No. 4 will not be capable of burning fossil fuel at a heat input rate of more than 250 x 10^6 BTU/hr. The amount of fossil fuel burned in the proposed boiler will be limited by the design of its fuel oil firing system, and specifically by the number and size of the oil-burning guns as explained below. Upon conversion of the boiler to burn oil by Central Illinois Gas & Electric Co., it was equipped with four sets of oil burners resulting in a steam production capacity of 300,000 lb/hr. Only two sets of oil burners will be installed in the boiler by U.S. Sugar Corp., thus limiting steam production from fossil fuel firing to 150,000 lb/hr. Based upon the projected boiler efficiency of 80 percent for fuel oil, the maximum steam production rate of 150,000 lb/hr will correspond to a maximum fuel-oil heat input rate of 225 x 10^6 BTU/hr. (See p. G-1 of application.)

In addition to these physical design limitations, U.S. Sugar Corp. will accept permit restrictions on the maximum fossil-fuel heat input to the proposed boiler. As discussed in Response to Question 12, oil consumption at proposed Boiler No.4 will be monitored very closely by U.S. Sugar Corp.

Response to Question 2

Surplus bagasse from the Clewiston mill is now being sold to the Quaker Oats Co. at Belle Glade, where it is used in the manufacture of furfural. The resulting bagasse residue is then sent to Sugar Cane Growers Cooperative's Glades Mill and burned as sulfur containing residue at that mill's boilers. U.S. Sugar Corporation's contract with Quaker Oats will soon terminate. Proposed Boiler No.4 will allow the Clewiston Mill to burn the surplus bagasse presently sold to Quaker Oats. The additional steam capacity from the new boiler will also provide for possible additional milling capacity at U.S. Sugar's Clewiston Mill in the future. In the meantime, with the mill at current grinding rates, existing Boilers No. 5 and 6 will not normally be operated since the proposed boiler will have capacity sufficient to replace the steam production from those boilers.

Response to Question 3

No additional process equipment is initially intended to be installed in connection with proposed Boiler No. 4. No other source of air pollution will be constructed or installed in conjunction with the proposed boiler.

Response to Question 4

This boiler is intended primarily to provide additional process steam to improve factory recovery performance in the extraction of sucrose. It will also provide additional power generating capacity as its steam is reduced from boiler operating pressure to process pressure in existing turbine generator sets. The new boiler will provide steam to produce an estimated 4 to 5 thousand kilowatts of additional electricity under these conditions. Rated electrical generating capacity for the entire Clewiston mill is currently 17,500 kilowatts. Actual maximum electrical generating capacity based upon steam availability is currently about 11,500 kilowatts. The addition of the proposed boiler will increase the actual maximum capacity to about 16,000 kilowatts. It should be emphasized that it is not economically feasible to operate the turbine generators at the Clewiston Mill solely for the purpose of generating electricity because the generators are all non-condensing types that exhaust steam at either 20 or 200 pounds psig. As such, the units are totally unsuited for use only as electrical generators. The turbine exhaust steam must be utilized in the milling process to make the electrical generation an efficient operation.

Response to Question 5

Components of this unit are presently located at the Clewiston mill site. It was originally installed and operated at the Central Illinois Gas and Electric Co. plant at Rockford, Illinois. It was built in 1953 and, according to information provided to U.S. Sugar Corp., was operated initially on gas and coal and later was converted to fuel oil. To the knowledge of U.S. Sugar Corp., no emission control equipment was utilized on this boiler at Central Illinois. In any event, the seller of the boiler did not offer any pollution control equipment to U.S. Sugar Corp. and made no mention of cyclones or mechanical dust collectors. U.S. Sugar Corp. has no information regarding environmental permits or emission levels for this boiler when operated in Illinois.

Response to Question 6

The varying combustion qualities of bagasse, resulting from changes in its moisture content and varying amount of soil and other extraneous material present in the cane, make it impossible to maintain a given level of efficiency in a bagasse burning boiler. This and the great difficulty of measuring bagasse flow have caused DER to previously agree with the sugar cane industry in the use of 55% as a reasonable boiler efficiency for the determination of bagasse heat input. An efficiency range of 50% to 60% is expected for this unit, when burning bagasse. U.S. Sugar Corp. agrees to conduct a boiler efficiency test after the proposed boiler begins operation as a condition of the construction permit.

Response to Question 7

250,000 lbs of steam per hour or 545.5 million Btu/hr heat input is the anticipated maximum capacity of this boiler. It is not anticipated that this capacity will be exceeded. Steam production for the new boiler will be monitored by a recording flow meter that continuously records the steam flow.

Response to Question 8

See response to Question 1.

Response to Question 9

The 375,000 gallon per year of fuel oil usage for the Clewiston mill, cited on page 1-6 of the original application, is an approximate figure for all of the boilers. As shown in Table 2-5, the annual average oil consumption for all boilers in 1981 and 1982 was 378,050 gallons. This figure does not include the pellet plant. The pellet plant did not operate in 1982, and averaged 91,440 gallons per year of fuel oil consumption during the last two years of operation, 1980-1981, with 134,576 gallons burned in 1981 (See Appendix I of PSD Report). Total fuel oil consumption at the entire plant for 1981-1982, including the pellet plant, averaged 445,338 gallons per year. The variation in the pellet plant's fuel useage between 1979 and 1982 was due to an increase in production reflecting the operation of either one or two dryers at one time. As stated in the application, the pellet plant will not be operated in the future. Significant portions of the pellet plant have already been removed from the Clewiston mill site, and the dryers will be removed if a purchaser for this equipment can be found. U.S. Sugar Corp. agrees to voluntarily relinquish the air operating permits for the pellet plant as a prerequisite to issuance of the operating permit for proposed Boiler No. 4.

Response to Question 10

The average cost per gallon of No. 6 oil containing 2.5 percent sulfur for 1979 thru 1984: 1979 - 50¢, 1980 - 58¢, 1981 - 69¢, 1982 - 64¢, 1983 - 65¢, and 1984 - 72¢.

Response to Question 11

According to price quotations recently obtained from Belcher Oil Co., the current delivered cost of No. 6 fuel oil is:

Containing 2.5 percent sulfur - 72¢/gallon
Containing 2.0 percent sulfur - 79¢/gallon
Containing 1.5 percent sulfur - 83¢/gallon
Containing 1.0 percent sulfur - 80¢/gallon

Oil with 1.5 percent sulfur is more expensive than 1.0 percent sulfur content oil because it is not a common specification for fuel oil and thus must be made specially by the blending of normal grades of oil.

Response to Question 12

Information requested on the fuel meters for the different boilers is as follows:

Boilers 1 & 2 - Bailey Meter Co.
Type - JR. 1323A - Style IA22
Model AO-1, S/N 633015-16
Purchased - 1968
Last Calibration - November 1983

Boiler 3 - Bailey Meter Co.
Type CS1, WSC - S/N-100335T&R
Purchased - 1944
Last Calibration - November 1983

All fuel meters function as designed, with an accuracy of at least 96 percent. The meters are calibrated annually, prior to every grinding season. Oil flow to each boiler is recorded continuously on strip charts. Records of oil flow are logged once per each 8-hour shift, and daily oil consumption per boiler is also logged throughout the period of boiler operation. The proposed boiler will be equipped with a Bailey oil meter similar to the existing meters.

Response to Question 13

There are by-passes on the fuel oil meters for existing Boilers No. 1, 2 and 3, as shown on the sketch provided as Attachment "A". The by-passes are used only if necessary for repair of a meter. In practice, failure of the meters necessitating by-pass is an extremely rare occurrance because of the design of the meters and the lubricity of the product measured. In view of the low incidence of such occurance, U.S. Sugar Corp. believes that keeping a log to record any time period when the oil meters on the existing or proposed boiler are by-passed should be sufficient to meet the Department's concerns. In this context, it should be reemphasized that the quantity of oil burned at the Clewiston Mill is of great interest to U.S. Sugar Corp. Accurate and reliable oil consumption data are thus considered to be crucial. Very close monitoring of oil flow to the boiler is critical because, with "free" waste fuel such as bagasse available, the cost of oil is viewed as an unnecessary expense to be avoided whenever possible. It is totally against U.S. Sugar Corp.'s economic interests to burn more than the minimum necessary amount of fuel oil at the Clewiston Mill.

Response to Question 14

Although the 1974 manufacturer's guarantee for the Joy Type D "Turbulaire" scrubber indicates a 95 percent particulate matter (PM) removal efficiency, this figure is specifically contingent upon an inlet grain loading to the scrubber of 1 gr./DSCF. Because of the very limited availability of test results measuring PM emissions either at the inlet to a scrubber or from a bagasse boiler without control equipment, it is not possible to substantiate the "guaranteed" efficiency for the sugar cane industry's boilers. In fact, spray impingement scrubbers utilized in the industry have not consistently met the original warranty level of 0.05 gr./DSCF, although outlet grain loadings measured during a number of compliance tests have been below this level.

The impingement scrubber proposed for Boiler No. 4 would be constructed by an independent shop, in accordance with drawings supplied by U.S. Sugar Corp. and under its supervision. It will be similar to the Joy Type D "Turbulaire" scrubber, with basically the same design parameters utilized by the original manufacturer. The scrubber design will be modified only as discussed in Response to Question 19, below, regarding manholes and handholes to facilitate maintenance. Note that the dimensions of the scrubber now proposed by U.S. Sugar Corp. are larger than the dimensions indicated in the original air construction permit application for reasons explained in response to Question 19 below. Pages from the original permit application document, with changes to reflect the size 200 scrubber, are provided in Attachment "D". A construction drawing for the proposed size 200 scrubber is provided as Attachment "E".

While no manufacturers guarantee for the proposed scrubber emission rate is available, U.S. Sugar Corp.'s extensive experience with spray impingement scrubbers should be recognized. The first scrubber of this type to be installed at a bagasse boiler was at a U.S. Sugar Corp. mill. The Company has thus been intimately involved in the intial design, installation, operation and maintenance of these scrubbers. The PM emission limit indicated in Response to Questsion 15, below, is therefore based upon years of operational data and experience, which we believe to be a far more useful and reliable basis than paper guarantees applicable only under theoretical conditions that may never be experienced in actual field operation.

<u>Response to Question 15</u>

In view of concerns expressed by DER staff, U.S. Sugar Corp. is prepared to accept a PM emission limit of 0.15 $lb/10^6BTU$ heat input for proposed Boiler No. 4, provided that DER agrees that this emission limit will be subject to review and reassessment if test data demonstrate that it cannot be achieved with the required consistency. This approach has been utilized for other recently permitted bagasse boilers in the sugar industry, including Bryant No. 5. U.S. Sugar Corp. will make all reasonable efforts to meet the 0.15 $lb/10^6BTU$ limit at proposed Boiler No. 4, including utilization of good operation and maintenance procedures for the boiler and emission control equipment.

A theoretical scrubber control efficiency can be estimated using the EPA AP-42 uncontrolled emission factor for PM and the proposed PM emission limit. The AP-42 factor is 16 lb.PM/ton of wet bagasse fired, or 1212 lb/hr for the proposed boiler. The proposed PM limit of 0.15 $lb/10^6$ BTU heat input would give an emission rate of 81.8 lb/hr. for the proposed boiler. These calculations represent a PM collection efficiency of 93 percent for the proposed scrubber.

There exists no known method of increasing the efficiency of the spray impingement scrubber. In regard to increasing the pressure drop, it should first be pointed out that the original manufacturer has recommended that the scrubber be operated between 5 inches and 9 inches pressure drop. Secondly, U.S. Sugar Corp. has been recording scrubber pressure drops during PM compliance tests since 1981 at the request of DER. The data show no relationship between pressure drop and PM emissions at pressure drops above 5 inches H_2O. Higher emission rates ($lb/10^6Btu$ heat input) have been experienced at pressure drops of 7.5 inches than have been recorded at 5.0 inches of pressure drop.

Investigation by U.S. Sugar Corp. has revealed no alternative PM control equipment expected to result in an emission rate lower than that proposed. Moreover, any available device that might achieve a PM removal efficiency equal to the proposed spray impingement scrubber would involve considerably higher costs. The permit application discussed several alternative control technologies, such as baghouses and electrostatic precipitators, that have not been adequately demonstrated for use with bagasse boilers. The two alternative technologies suggested by DER staff are addressed below.

Venturi scrubbers are utilized on six bagasse boilers in Florida, as pointed out in the permit application for the proposed boiler. PM emission test data for those boilers, presented in the permit application, demonstrate that their PM emission rates do not differ appreciably from the test results for

U.S.Sugar Corp.'s boilers equipped with impingement scrubbers. While the test results for one boiler (Talisman No. 6) do appear somewhat lower than the rest, the data for all of the boilers with Venturi scrubbers show considerable variation, with an overall average emission rate of 0.2 $lb/10^6$ BTU heat input for reported tests. These data indicate that the venturi scrubbers have not achieved a greater degree of emission reduction than that achieved with the spray impingement scrubbers. Moreover, installation and operation of a venturi scrubber would be considerably more expensive than corresponding costs for the proposed spray impingement scrubber.

The venturi scrubber requires a pressure drop two to four times greater than the impingement scrubber, with correspondingly higher energy costs and more consumption of water. A 21-inch pressure drop for the venturi scrubber would require approximately twice the induced draft fan horsepower than the spray impingement scrubber for this boiler. At current cogeneration electricity sales rates of approximately 4.5 cents a kilowatt and assuming 24-hour per day operation, the energy cost of operating a Venturi scrubber at proposed Boiler No. 4 would exceed that for the impingement scrubber by approximately $150,000 per season. Higher maintenance costs can also be expected for a venturi scrubber, due to the accelerated wear of exposed surfaces caused by the abrasive nature of the fly ash and high gas velocities encountered in the venturi and across the exhaust fan.

U.S. Sugar Corp. has also evaluated a "packed tower" scrubber as an alternative PM control technology. This type of control device utilizes packing material in the scrubber itself. Because of the size and characteristics of the particles in the exhaust gas stream from a bagasse-fired boiler, a packed-tower scrubber would have a very high likelihood of plugging problems. To the knowledge of U.S. Sugar Corp., a packed-tower scrubber has not been tested or demonstrated on a bagasse-fired boiler. For these reasons, the packed-tower scrubber is not a feasible option for proposed Boiler No. 4.

Response to Question 16

The scrubber will be equipped with an adjustable overflow weir for continuous overflowing to regulate the water level in the scrubber. Since more water is normally added through the sprayer than is evaporated, the overflow will control the level within the scrubber. Additionally, a low level alarm for abnormal low water conditions will be provided. Water flow to the sprays is determined by the water pressure on the header. This pressure will be monitored. A water manometer will be installed on the scrubber to monitor pressure drop across the scrubber.

Response to Question 17

The scrubber water will not be recirculated. Fresh makeup water will be drawn from the mill supply channel, and scrubber bleed-off water will be discharged to a settling pond. In order to assure that the scrubber inlet water remains at a pH of about 7 or above 8, U.S. Sugar Corp. will periodically measure the scrubber inlet pH. During the first crop season of operation of the new boiler, it is proposed that the measurement be made weekly, and if these measurements indicate a relatively constant level, that the measurement frequency be reduced to monthly for subsequent crop seasons. However, it is emphasized that the alkaline nature of the bagasse fly ash acts to increase or maintain the pH of the scrubber water. Therefore, the inlet water to the scrubber is not necessarily an accurate indication of SO_2 removal potential of the scrubber.

Response to Question 18

It is feasible to add an alkaline solution to the water. However, there is no evidence that doing this would increase SO_2 removal. As discussed in the response to Question 17, the scrubber water is already very alkaline in nature. The available test data, presented in the application, indicate that better than 95 percent SO_2 removal is already obtained by the proposed BACT system (impingement scrubber). A 50 percent SO_2 removal efficiency was assumed in the application to be conservative. There is no need to add a costly alkaline solution to the scrubber liquid when removal efficiencies are already extremely high for bagasse burning. The small amount of fuel oil anticipated to be burned in the proposed boiler does not justify additional measures to reduce SO_2 emissions from fuel oil burning.

Response to Question 19

The scrubber shown in the original air construction permit application for Boiler No. 4 was a "size 150", selected in accordance with the original scrubber manufacturer's specifications. However, during negotiations with DER related to the recently issued Consent Order, U.S. Sugar Corp. has agreed to accept, under certain conditions, a PM emission limit of 0.15 $lb/10^6$ BTU heat input. As a result of the above, and in the hope that a larger scrubber working in the lower end of its design capacity may produce some slight improvement in its removal efficiency such that under certain marginal conditions it may provide the margin to allow compliance with this stringent PM emission limit, U.S. Sugar now proposes to use a larger "size 200" scrubber in lieu of the "size 150" unit originally selected. Pages from the original permit application documents, with changes to reflect the size 200 scrubber, are provided in Attachment "D". A construction drawing for the size 200 scrubber is provided as Attachment "E".

For comparison purposes dimensions for the existing scrubbers and the proposed Boiler No. 4 scrubber are provided below:

Clewiston Boilers 1 & 2	- 17' diameter, 39' height
Clewiston Boiler 3	- 14' diameter, 32.5' height
Bryant Boiler 5	- 19' diameter, 42' height
Proposed Boiler 4	- 22' diameter, 51' height

The proposed scrubber will be equipped with adjustable weirs, gas-lock release mechanism, and centrifugal-type spray eliminators. The proposed scrubber will also be equipped with a rotating water spray in its demister section to wash the spin vanes. Additionally, manholes and handholes will be provided at specific areas (spin vane section, bottom core, around periphery of the scrubber throat) for rodding and unplugging while the scrubber is in service. It should be noted that the location proposed for installation of this scrubber (before the induced draft fan) will allow cleaning and unplugging while operating due to the fact that it is under sub-atmospheric pressure. It should be emphasized that the applicant has very great interest and motivation to avoid plugging of the scrubber, as it reduces the boiler efficiency and impedes the steam production capacity of the boiler.

Response to Question 20

None of the scrubbers in operation at the Clewiston mill have bypasses around the scrubbers. Therefore, when the boilers are in operation the exhaust gasses must pass through the scrubber. It would be a highly unusual circumstance for any boiler to operate while its scrubber water level is low. In fact, operation of the boiler with little or no water in the scrubber would create significant problems in that the epoxy coating applied to the fan blades would not withstand the high gas temperatures (450^{o}F) that would occur in such circumstances.

The only recurring problem that has been experienced with the spray-impingement scrubbers on existing bagasse boilers has been plugging of the scrubber by conglomeration of particles removed from the gas stream. As discussed in Response to Question 19, the proposed scrubber will have handholes and manholes to allow unplugging while the scrubber is in operation. In the event that a spray impingement scrubber does become plugged, the water level in the scrubber increases and the gas flow is restricted, ultimately adversely affecting boiler operation. This is a matter of great concern to the operator, and provides considerable incentive for immediate correction of the problem. Unplugging can be readily accomplished without adversely affecting the boiler or scrubber operation, as the system operates under negative pressure.

Response to Question 21

Engineering of the stack has not yet been completed. Suitable access to the sampling platform (i.e. caged ladder) will be provided in accordance with OSHA requirements and Florida Administrative Code Rule 17-2.700(4). The location of the sampling ports will meet the criteria of eight stack diameters downstream from the nearest flow disturbance and two stack diameters upstream from the nearest flow disturbance.

Response to Question 22

The high moisture content of the bagasse (average of 55%) will in itself minimize any fugitive emissions of bagasse due to bagasse handling operations. As such, emissions of fugitive bagasse are expected to be minimal. Fugitive particulate emission factors for bagasse handling have not been developed, and therefore quantification is not possible. As a result of the operation of proposed Boiler 4, bagasse handling operations will actually decrease and the on-site bagasse storage will be reduced significantly. This is because excess bagasse which currently cannot be used at the Clewiston mill is conveyed to an outside storage pile, then loaded by payloader into trucks for shipment to Quaker Oats Company. Quaker Oats manufactures furfural from the bagasse and sends the resulting bagasse residue to Sugar Cane Growers Coop. for burning in their boilers. In 1983, approximately 40,000 tons of bagasse was shipped to Quaker Oats. Upon start-up of the proposed boiler, shipment of excess bagasse to Quaker Oats will be discontinued, and bagasse will be routed from the sugar cane mills directly to the boiler. This will eliminate the conveying, storage, reclaiming, and shipping operations currently necessary for the excess bagasse. Thus, fugitive bagasse emissions will be reduced as compared to present operations.

Response to Question 23

Latitude and longitude are correct as stated.

Response to Question 24

The plant site is completely surrounded by a fence except to the southeast, where sugar cane fields border the site. The point of nearest public access is approximately 400 meters west of the boilers outside the fence. U.S.G.S. maps marked to show property lines and fences have previously been supplied to Cleve Holladay.

Response to Question 25

The SO_2 and ozone air quality data collected by FSCL are not available at this time. Ambient air quality concentrations of ozone were not assumed in the application, since ozone impacts cannot be accurately estimated. Since SO_2 data are not available, no comparisons can be made between these data and the SO_2 air quality levels assumed in the application.

Response to Question 26

Fan performance data are provided in Attachment "B", in lieu of the curve requested.

Response to Question 27

See letter from Florida Sugar Cane League dated March 21, 1984 and provided as Attachment "C".

Response to Question 28

The maximum SO_2 impacts for Boiler No. 4 presented in the PSD report reflect maximum fuel oil burning conditions for each day of the crop year (184 days).

As stated in the report, these impacts are considered to be conservative since fuel oil burning in the boiler will be limited to 500,000 gallons per year, or less than 14 days per crop year at the maximum fuel oil burning rate. Fuel oil usage in the boiler will be minimized because of the costly nature of burning this fuel (bagasse is a waste product and represents free fuel). For this reason, SO_2 impacts while burning all bagasse in the boiler are considered to be more representative of actual ambient impacts. Under these conditions, highest, second-highest, 24-hour SO_2 impacts are predicted to be 10 ug/m^3 (obtained by multiplying the maximum PM impact of 8 ug/m^3 by the ratio of SO_2 to PM emissions: 136.4 - 109.1). This SO_2 impact level is well below the PSD de minimis impact level of 13 ug/m^3, 24-hour average. Based upon these considerations, it is requested that U.S. Sugar Corporation be exempted from the PSD preconstruction monitoring requirements for SO_2. Ambient ozone data for the FSCL monitors are not presently available. U.S. Sugar Corp. requests that ambient ozone data from the Twenty-Mile Bend monitoring station operated by Palm Beach County Health Dept. (SAROAD No. 3420-006-G03) be utilized if necessary to satisfy preconstruction monitoring requirements. These data are contained in the Department's SAROAD data bank.

Response to Question 29

Based upon the GEP analysis presented in Section 2.3.2 of the PSD report, the only structure at the Clewiston mill which has the potential to influence the Boiler No. 4 stack is the Boiling House. This building is 90 feet tall and 153 feet by 220 feet in width. Because of the Boiler House's orientation in relation to the proposed Boiler No. 4 stack location, only certain wind directions will influence the stack. These directions are approximately 110° to 150° and 290° to 330° (clockwise from North).

Although there is a potential for building downwash conditions to occur for these directions, several factors indicate that the frequency and magnitude of the maximum concentrations produced under building downwash conditions are expected to be minimal.

The proposed Boiler No. 4 stack will be located about 300 feet from the Boiling House, and, therefore, less likely to be under the influence of the building downwash effects than if it were located on or immediately adjacent to the building. Also, most air dispersion models that evaluate building downwash conditions, e.g. ISC model, assume that the stack is on or adjacent to a building. Therefore, application of these models to evaluate building downwash effects for stacks located away from a building is not appropriate for estimating maximum ground-level concentrations.

To estimate the frequency of potential building downwash conditions occurring at the plant site, meteorological data collected at the National Weather Service Station in West Palm Beach were reviewed. The frequency of meteorological conditions which are likely to produce building downwash conditions are low, occurring less than 6 percent of the time for a particular wind direction on an annual average basis. For example, the annual average frequencies of wind directions for all atmospheric stabilities from the east-southeast and southeast (which will influence the stack emissions for directions towards 110° to 150°) are 10.2 and 8.2 percent, respectively. However, because building downwash conditions are most likely to occur for neutral to slightly unstable stabilities, the annual average frequencies of these stabilities occurring for east-southeast and southeast wind directions are 6 and 5 percent, respectively. In fact, because building downwash conditions generally occur for moderate to high wind speeds, the potential for building downwash conditions to occur for these wind directions is even lower than the indicated frequencies.

For other wind directions for which building downwash conditions may occur (i.e., west-northwest and northwest), the annual average frequencies for all atmospheric stabilities are less than 6 percent and for neutral and slightly unstable stabilities (i.e. conditions conducive to building downwash) are less than 4 percent.

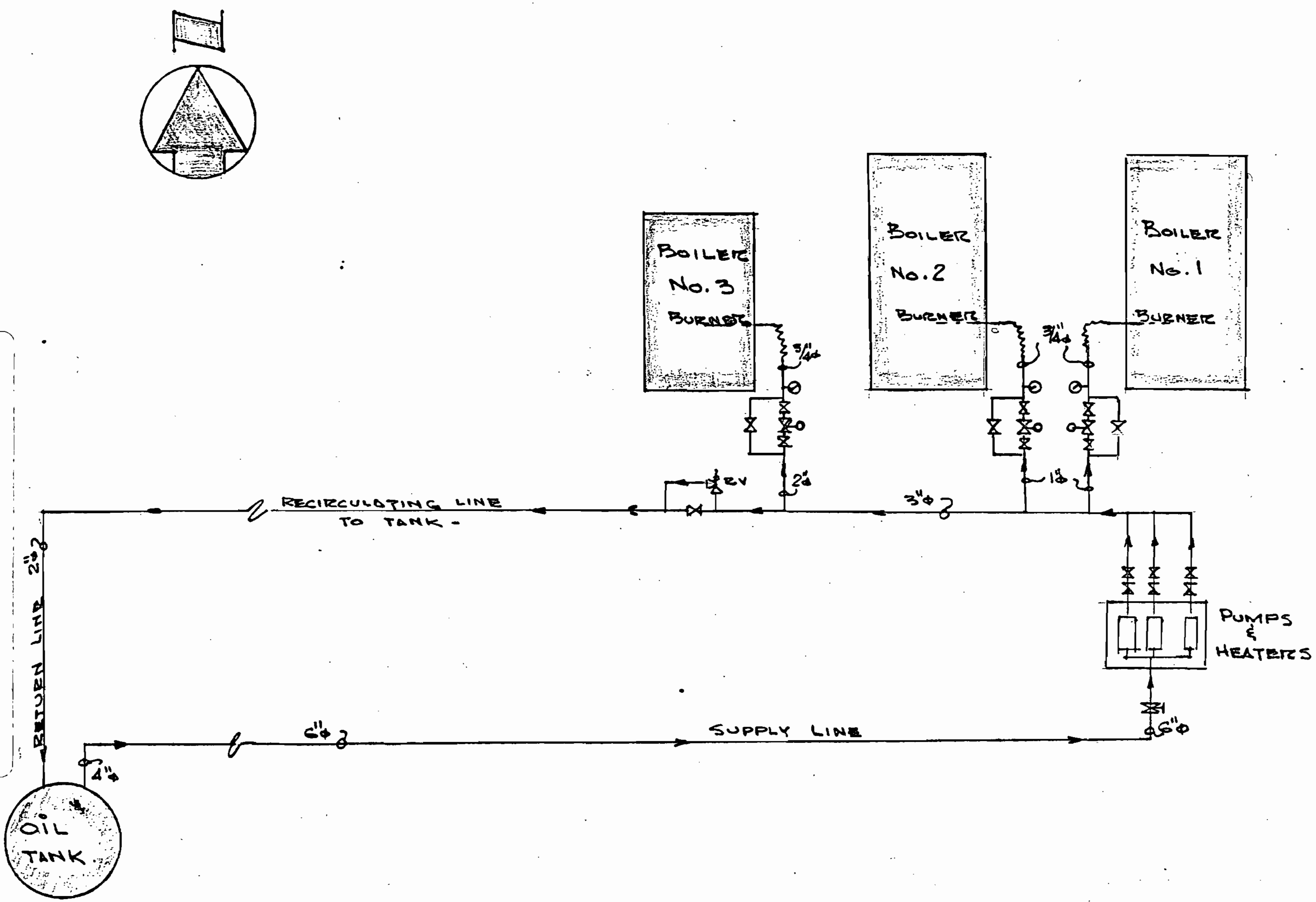
The maximum SO_2 emissions are emitted when Unit 4 is firing oil, an operating mode which will occur for a maximum duration equivalent to 14 days during the year. Therefore, the joint frequency of meteorological conditions that may produce building downwash effects and the occurrence of worst-case SO_2 emissions is extremely low. For example, the joint frequency of east-southeast wind directions for all atmospheric stability classes and worst-case SO_2 emissions is 0.23 percent on an annual average basis (i.e. 6 percent times 14/365 days). The joint frequency of building downwash conditions occurring for other wind directions and worst-case SO_2 emissions is even lower.

In response to Cleve Holladay's request, Environmental Science and Engineering, Inc. has conducted an expanded downwash modeling analysis of the proposed Boiler No. 4 stack. This analysis is provided as Attachment "F". A copy of the computer model printouts to support the analysis is included in the copy of Attachment "F" supplied to Mr. Holladay.

LIST OF ATTACHMENTS

Attachment "A"	-	Sketch Showing Fuel Oil Meters
Attachment "B"	-	Fan Performance Data Sheet
Attachment "C"	-	Letter from Florida Sugar Cane League dated March 21, 1984
Attachment "D"	-	Revised Pages of Permit Application Documents
Attachment "E"	-	Construction Drawing for Size 200 Scrubber
Attachment "F"	-	Expanded Downwash Modeling Analysis Prepared by ESE. (Computer printouts included in Cleve Holladay's copy.)

ATTACHMENT "A"



CLEWISTON SUGAR HOUSE

BOILERS FUEL OIL SUPPLY

U.S.S.C.

BEST AVAILABLE COPY

AMERICAN BLOWER CORPORATION

ORIGINAL - To be attached to data, etc., and retained at Branch Office—file alphabetically.
DUPLICATE - To be mailed to Home Office with order. Additional copies made and distributed as required.

SELECTION SHEET NO.

Made by [illegible] Office

Date 1/30/72

Checked by .... Office

Copies to ....

Checked by .... Detroit Office

Name of Job [illegible]

Location CHARLESTON

Use I.D. FAN

Quotations to ....

Arch. or Eng. ....

DATA BOOK REFER.: Section | Page | Date

Fan Duty
4. 136,000 CFM @ 19.0" SP, 160°F
3. 136,000 CFM @ 12.0" SP, 160°F

Selection No
1.
2. #537 DI 3/3 DW SIROCCO w/ [illegible]
3.
4.
5. 169,000 CFM @ 19.0" SP, 160°F
6. 169,000 CFM @ 12.0 SP, 160°F

Selection	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Steam/Hr.	458,000		458,000			
Gas/Hr	[illegible]	570,000	[illegible]	570,000	570,000	570,000
Air/Hr						
C.F.M.	136,000	136,000	136,000	136,000	169,000	169,000
Temp	160°		160		160°	160°
Elevation	SL		SL		SL	SL
Spec. Grav. Gas	.0562	.0698	.0562	.0698	.0562	.0562
	4620	4157	4620	4157	4620	4620
Outlet Area	29.38		29.38		29.38	
Diam Wheel	53 3/4		53 3/4		53 3/4	
Circum.	14.07		14.07		14.07	
Outlet Velocity	4630	4630	4630	4630	5760	5760
V.P.	1.01	1.24	1.01	1.24	1.555	1.555
S.P.	19.0	19.0	12.0	12.0	19.0	12.0
T.P.						
V/S or V/T	.0533	.0653	.0842	.1032	.0820	.1295
%C.	44.5	49	54.2	58.5	51.5	63
%S.E. or M.E.	75.5	74	70	65	70.0	57.5
S.P./P.V.P.	2.58	2.56	2.45	2.32	2.48	2.17
P.V.P.	7.37	7.42	4.90	5.17	7.67	5.53
P.V.	12520	11350	10230	9380	12780	10875
R.P.M.	893	808	730	[illegible]	910	773
B.H.P.	538	550	367	396	723	457

ATTACHMENT "B"

Florida Sugar Cane League, Inc.
POST OFFICE BOX 1148
CLEWISTON, FLORIDA 33440
(813) 983-9151

March 21, 1984

Mr. David Buff, P.E.
Environmental Science & Engineering, Inc.
P. O. Box ESE
Gainesville, Florida 32602

Dear Mr. Buff:

Reference is to the copy of DER's letter of 3 March 1984 commenting on U. S. Sugar Corporation's Boiler #4 PSD application which you sent on 8 March. Specific reference is to items 25, 27, and 28. I understand that you have talked with Mr. Dalton Yancey and Mr. M. Bellamy concerning the sulfur dioxide and ozone data (items 25 and 28).

This letter transmits information on item 27, the three dates of high TSP readings at FSCL Hi-Vol Monitor #19. Monitor 19 is located in the southeast corner of Section 15, Range 34 E, Township 44 S. The dates pertain to two different crop years even though all are in chronological 1983: 12 January, 19 March (the 1982-83 crop year) and 2 December (the 1983-84 crop year). On the enclosed maps for each of the dates, I have plotted a black dot over the site of the monitor. The black circle defines a five-mile radius centered on the monitor. I have indicated the locations of pre-harvest sugarcane field burning, by date and by acreage, for those fields burned on the hi-vol monitor operating date and for the three preceding days. Obviously, the hi-vols will trap SP originating from field burning and also SP's originating from other harvest operations including field and road transport vehicle loading and road transport itself. Fields usually are burned on "day 1," cut manually on "day 2," and loaded for transport to the mill on "day 3" or "day 4." Or, fields burned on "day 1" may be harvested mechanically on "day 2" or "day 3." The operations subsequent to burning will influence TSP loadings. Please note that burning and/or harvesting operations were in progress in Section 15 or in adjacent sections on all three dates.

ATTACHMENT "C"

Please call or write if you have question or comment on the foregoing or on the enclosures.

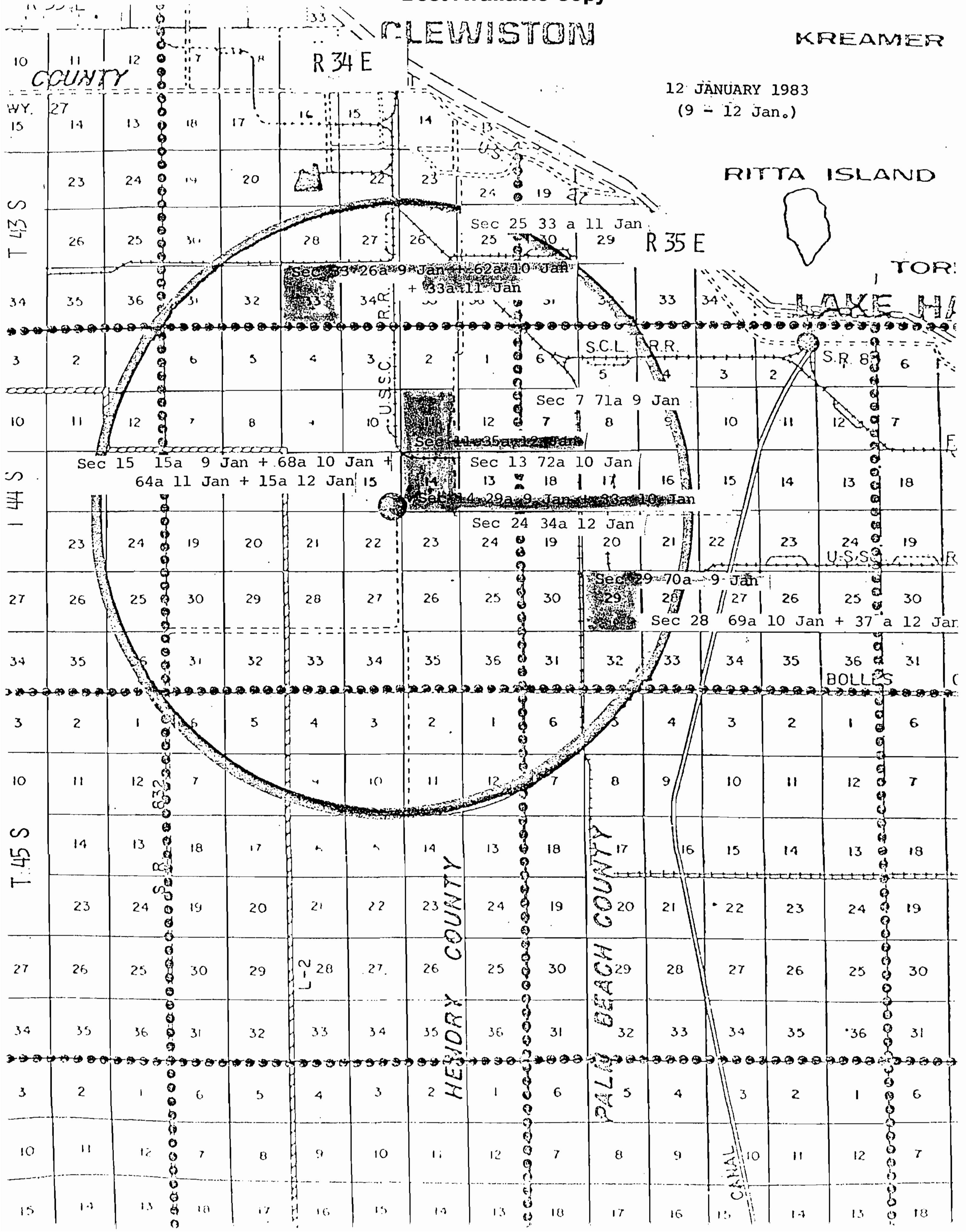
Sincerely yours,

J. R. Orsenigo
Vice President-Research

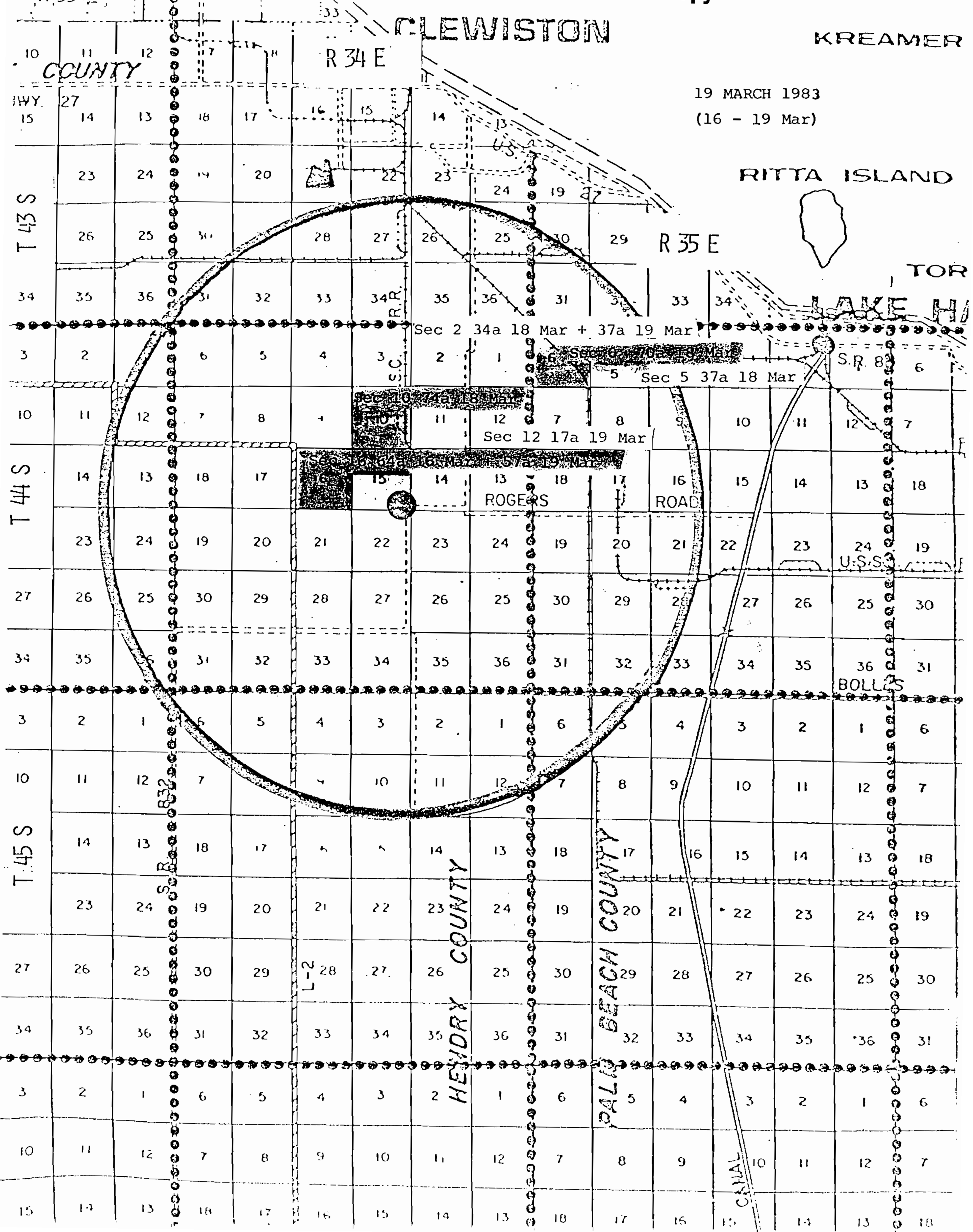
JRO/cmw

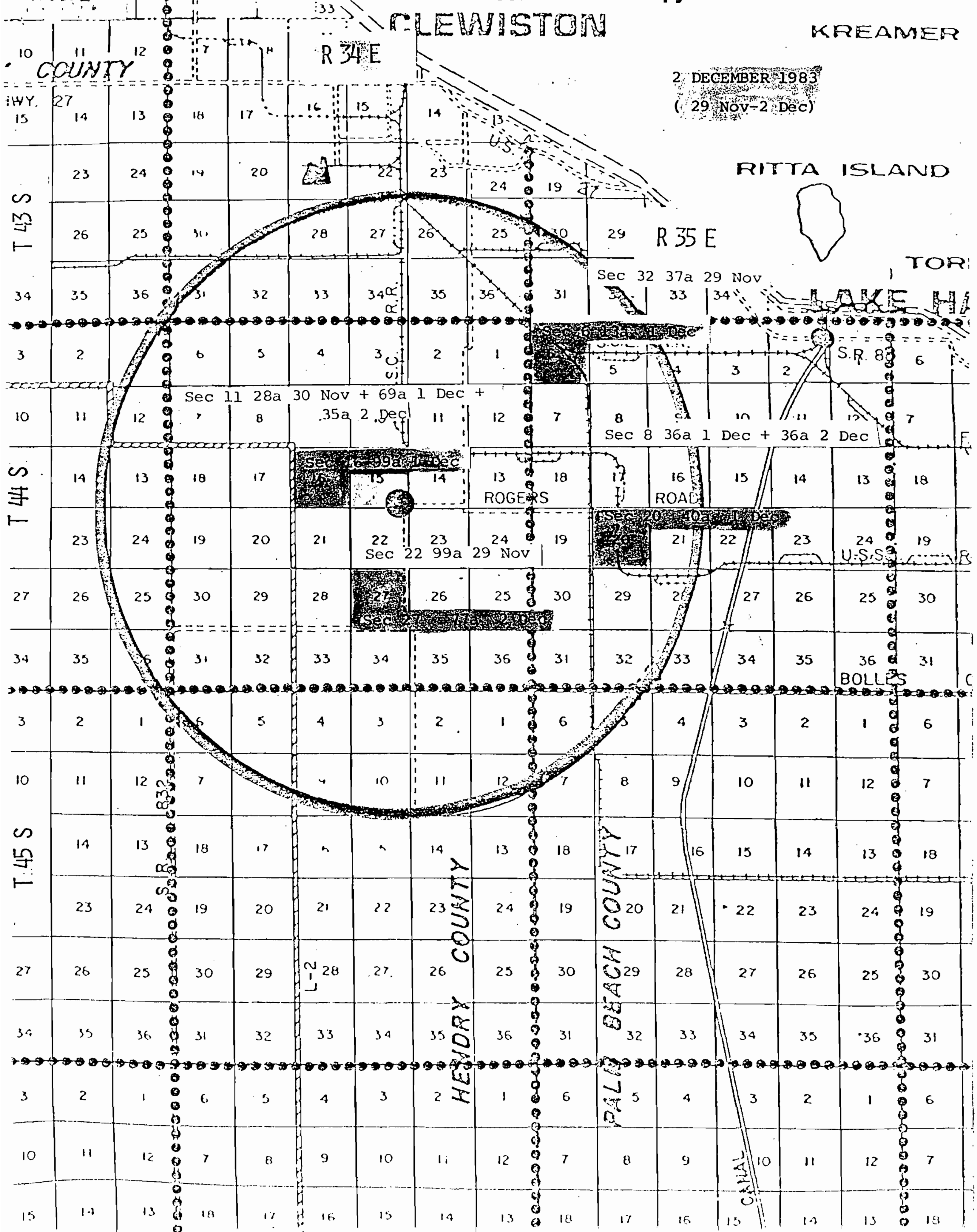
Enclosures

cc: Mr. A. R. Mayo (w/enclosures)


CLEWISTON
KREAMER
12 JANUARY 1983
(9 - 12 Jan.)
RITTA ISLAND
R 34 E
R 35 E
T 43 S
T 44 S
T 45 S
COUNTY
Sec 25 33 a 11 Jan
Sec 33 26a 9 Jan + 62a 10 Jan
+ 33a 11 Jan
Sec 7 71a 9 Jan
Sec 11 35a 12 Jan
Sec 15 15a 9 Jan + 68a 10 Jan +
64a 11 Jan + 15a 12 Jan
Sec 13 72a 10 Jan
Sec 14 29a 9 Jan + 33a 10 Jan
Sec 24 34a 12 Jan
Sec 29 70a 9 Jan
Sec 28 69a 10 Jan + 37 a 12 Jan
S.C.L. R.R.
U.S.S.C. R.R.
S.R. 80
S.R. 832
U.S.S.
BOLLES
L-2
HENDRY COUNTY
PALM BEACH COUNTY
CANAL

Best Available Copy




CLEWISTON
KREAMER
2 DECEMBER 1983
(29 Nov-2 Dec)
R 34 E
R 35 E
COUNTY
HWY. 27
U.S.
RITTA ISLAND
T 43 S
T 44 S
T 45 S
Sec 32 37a 29 Nov
Sec 11 28a 30 Nov + 69a 1 Dec +
35a 2 Dec
Sec 8 36a 1 Dec + 36a 2 Dec
Sec 22 99a 29 Nov
S.C.R.R.
S.R. 80
ROGERS
ROAD
U.S.S.
BOLLES
S.R. 832
L-2
HENDRY COUNTY
PALM BEACH COUNTY
CANAL

ATTACHMENT "D"

Revised Pages of U.S. Sugar Corp. Air Permit Application Documents to Reflect Proposed "Size 200" Scrubber

ATTACHMENT "D"

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Spray Impingement Scrubber Joy Turbulaire	Particulate	90+%	See PSD Report	See PSD Report
Type D, Size 200 or	SO_2 from bagasse	50%	N/A	"
equivalent				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Bagasse		68,182 lb/hr dry 151,528 lb/hr wet	545.5
No. 6 Fuel Oil		1,499 gal/hr	225.0

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: See PSD Report

Percent Sulfur: ______ Percent Ash: ______

Density: ______ lbs/gal Typical Percent Nitrogen: ______

Heat Capacity: ______ BTU/lb ______ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average Not Applicable Maximum Not Applicable

G. Indicate liquid or solid wastes generated and method of disposal.

Water from Scrubbers used to sluice cane juice mud. Scrubber water discharges to holding ponds.

standards for carbonaceous fuel burning equipment (i.e., bagasse boilers). U.S. Sugar Corporation considers the spray impingement scrubber to be the Best Available Control Technology (BACT) for bagasse boilers considering their proven ability in the Florida sugar cane industry, economics, energy considerations, and environmental impacts.

The spray impingement scrubber will be manufactured under the supervison of U.S.Sugar Corp. The design will be equivalent to a Western Precipitation (Joy) Turbulaire scrubber, Type D, Size 200, and will operate at a pressure drop of approximately 5.5 inches of water (in. H_2O) and at a water usage rate of 200 to 350 gallons per minute (gpm). Details of the scrubber design, Joy manufacturing literature, and Joy's performance guarantee for this scrubber design are presented in Appendix C.

The exhaust fan, also to be manufactured by U.S. Sugar Corporation, will be of American Standard design, equivalent to Model 537 DI 2/3 DW, Series 2014. The fan will operate at approximately 1,000 revolutions per minute (rpm) and 800 to 1,000 horsepower at a static pressure of about 18 in. H_2O. The fan will be electrically driven. A fan curve in not available.

In addition to the fuel oil usage limitations placed on the new boiler, limitations will also be placed on operation of the existing boilers. These limitations will ensure that all ambient air quality standards are not exceeded in the vicinity of the Clewiston mill due to mill operation. The limitations, itemized below, are discussed in more detail in the remainder of this section.

1. Total mill fuel oil consumption will be limited to 6,300 gallons for a 3-hour period (average of 2,100 gallons per hour) and 40,800 gallons for a 24-hour period (average of 1,700 gallons per hour).
2. Allowable PM emissions for Boilers 1 and 2 will be reduced to 0.25 $lb/10^6$ Btu when burning bagasse.

3.0 BEST AVAILABLE CONTROL TECHNOLOGY EVALUATION

The source applicability analysis for the proposed Clewiston Boiler 4, presented in Section 2.0, identified the following emitted air pollutants as requiring a BACT review under federal and state PSD regulations:

Particulate Matter (PM)
Sulfur Dioxide (SO_2)
Nitrogen Oxides (NO_x)
Carbon Monoxide (CO)
Volatile Organic Compounds (VOC)
Arsenic (As)

The State of Florida has received review authority for the federal PSD program (Federal Register, Vol. 48, No. 226, November 22, 1983). In addition, Florida has passed PSD regulations and BACT requirements similar to EPA. DER defines BACT as follows [Ch 17-2.100(22), FAC]:

> An emission limitation, including a visible emissions standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of each such pollutant . . . Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.

The remainder of this section describes the proposed BACT and emission limit for each pollutant subject to BACT. An analysis of alternative control technologies, including economic, energy, and environmental considerations, is also presented.

3.1 PARTICULATE MATTER

3.1.1 Proposed Particulate Matter BACT

On the basis of environmental, energy, and economic impacts, the Western Precipitation (Joy) Turbulaire impingement scrubber, Type D, Size 200, or equivalent design, was selected as BACT for the proposed bagasse/

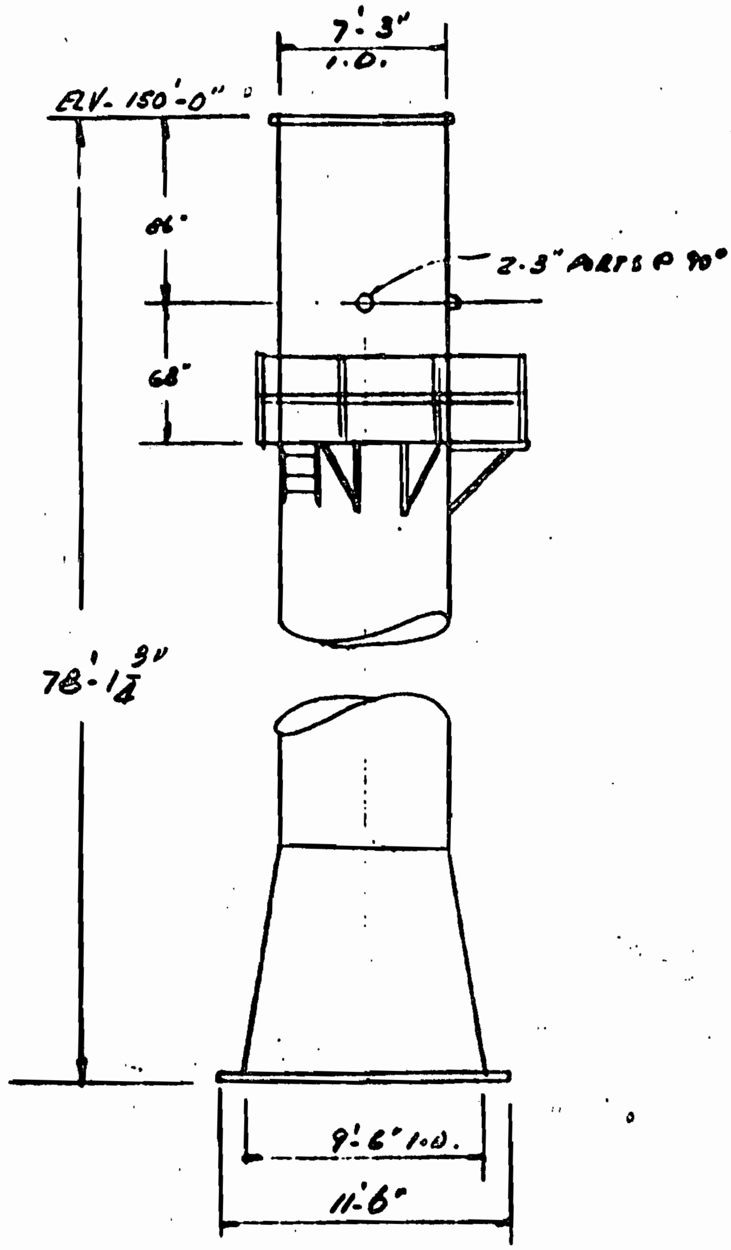
oil-fired boiler. This system is well demonstrated on existing bagasse/oil-fired boilers in the industry, has a proven operational record with high reliability and low maintenance, and displays low-energy requirements (ΔP = 5 to 9 inches H_2O). The proposed scrubber will operate at a pressure drop of about 5.5 inches H_2O, which is in the range recommended by the manufacturer. Above this range, increased wear of scrubber surfaces, increased particulate entrainment, increased fan capacity, and increased energy input reduce the effectiveness of the system. Water flow rate through the scrubber will be in the range of 200 to 350 gallons per minute (gpm).

In an impingement scrubber, the gas to be cleaned passes through a peripheral nozzle and is guided downward at high velocity into a liquid bath. The level of the liquid bath is maintained slightly below the nozzle by means of an adjustable weir. Collection of flue gas particles is by both direct impaction with the liquid bath and by collision with droplets atomized by the action of the gas stream upon the liquid bath. Mist elimination, achieved by centrifugal action and swirl vanes, precedes gas discharge.

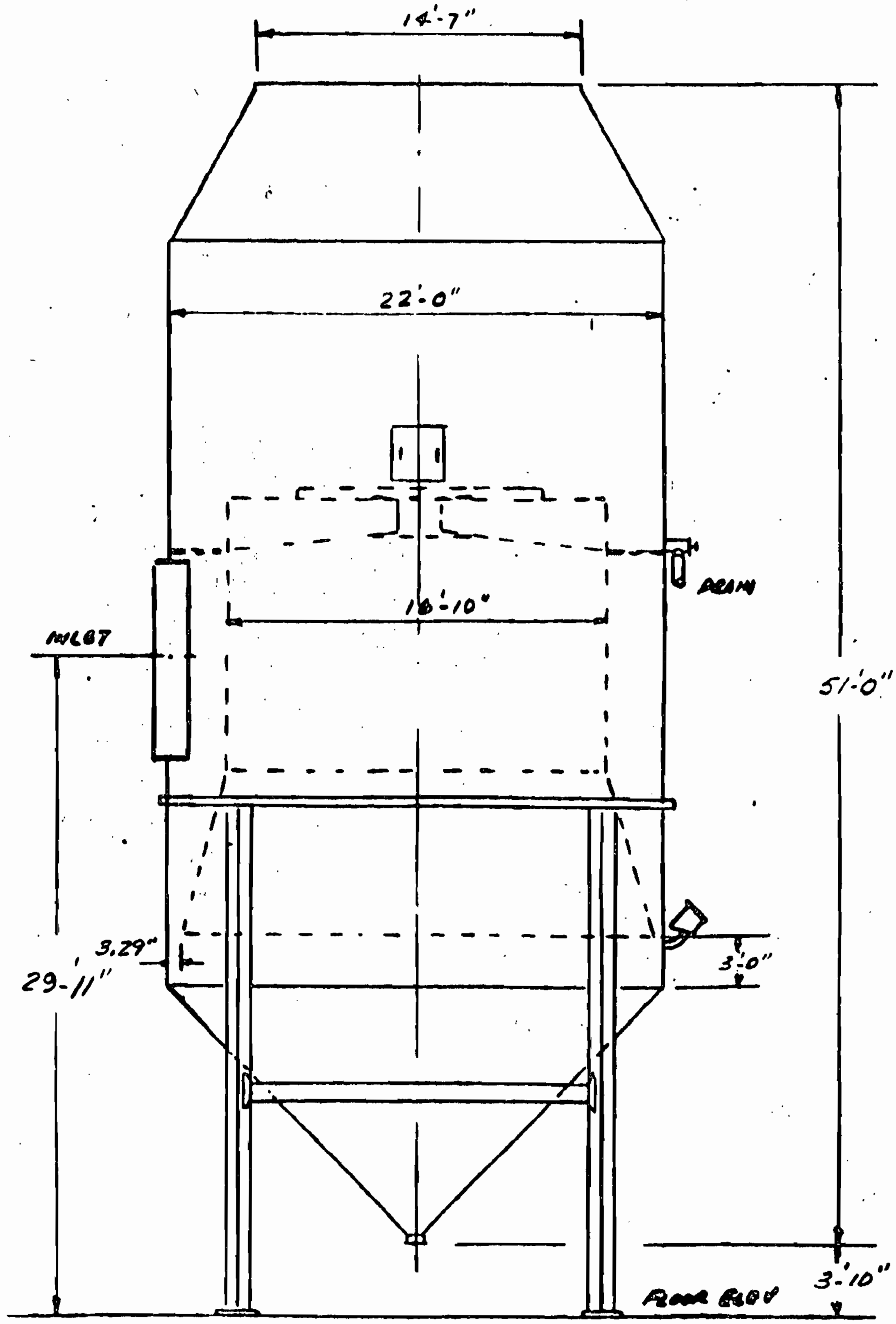
The proposed BACT emission limit for PM when burning bagasse was determined by a source-specific analysis of impingement scrubber performance at the U.S. Sugar Clewiston and Bryant mills. Boilers 1, 2, and 3 at the Clewiston mill were considered in the analysis since these have the same scrubber configuration as the proposed boiler (i.e., scrubber before the I.D. fan). Boilers 5 and 6 at Clewiston have the I.D. fan before the scrubber, and the data from these installations are not considered to be representative of the proposed boiler because the I.D. fan may create smaller particles, making them harder to capture.

Boiler 5 at the U.S. Sugar Bryant mill was also evaluated since the boiler is of the same size as the proposed Boiler 4 (250,000 lb stm/hr) and is also equipped with a spray-impingment scrubber. All

STACK BOILER No 4



SCRUBBER BOILER NO 4
SIZE D-200



May 10, 1984

83-172-0100

U.S. Sugar Corporation Boiler No. 4

Expanded Building Downwash Analysis

The Good Engineering Practice (GEP) stack height analysis presented in Section 2.3.2 of the PSD report indicated that the stack for the proposed Boiler No. 4 will be less than GEP height. This evaluation demonstrated that the only structure at the Clewiston mill which has the potential to influence the proposed boiler's stack is the Boiling House building. This building is 90 feet high, 153 feet by 220 feet in width, and located about 300 feet from the proposed stack. Because of the Boiling House's orientation in relation to the proposed stack location, the stack is influenced by this building for only certain wind directions. These directions are approximately 110° clockwise to 150° and 290° clockwise to 330° (directions from north).

To further evaluate the potential effects of building downwash on the proposed boiler, a building downwash screening analysis was performed based on U.S. EPA's latest guidance (i.e. Regional Workshops on Air Quality Modeling: A Summary Report, December 1983). This consisted of evaluating the potential maximum ground-level concentrations within the cavity and wake regions of the Boiling House building.

According to EPA guidance, the cavity region extends up to a distance of 3L downwind from a building, where L is the lesser of the building height or projected width. Since the height of the Boiling House is 90 feet, which is less than either the length or width of the building, the cavity region extends up to 270 feet (i.e. 3 x 90 feet) downwind from the Boiling House. Therefore, the cavity region will not extend to the proposed boiler's stack, which is 300 feet away. Therefore, no further analysis is required because the stack will not be located within the cavity region of the Boiling House.

ATTACHMENT "F"

The wake region extends from 3L to 10L downwind from a building. Similar to the cavity region analysis, with L equal to 90 feet, the wake region extends from 270 to 900 feet from the Boiling House. The stack is located 300 feet from the Boiling House, and therefore, within that building's wake region. Based on the procedures presented in the EPA Summary Report, the following screening approach was used to evaluate building downwash effects on the proposed stack within the wake region:

1. Concentrations were calculated for a building height and projected width of 90 and 268 feet, respectively. The projected width is based on the diagonal of the building. For modeling purposes, the projected width was adjusted because the ISC model uses an effective building diameter for the building width.

2. The transitional plume rise option in the IS model was selected.

3. Receptors were located at plant property out to 2000 meters. The following distances were included: 426, 462, 522, 578, 623, and every 100m from 700 to 2000 m downwind from the proposed stack.

4. Hourly, ground-level plume centerline concentrations were calculated for a set of representative meteorological conditions, which consisted of 20 combinations of wind speed and atmospheric stability, mixing height of 5000m, and ambient temperature of 293 K.

The maximum hourly concentrations for each combination of meteorological condition are presented in Tables 1 and 2 for the proposed boiler firing oil and bagasse (SO_2 concentrations only), and bagasse only (SO_2 and TSP concentrations), respectively. In addition to the hourly concentrations predicted under building downwash conditions, concentrations are presented assuming building downwash conditions do not occur (i.e. Gaussian dispersion). In general, the highest concentrations for each stability occur under building downwash conditions for moderate to high wind speeds and at the nearest plant property. Under unstable and neutral conditions, the maximum 1-hour concentrations under building downwash conditions increase by up to a factor of two from those predicted without building downwash assumptions. For stable conditions, maximum 1-hour concentrations under building downwash conditions are much higher than those predicted without downwash conditions. However, the results for stable conditions are suspect since the building downwash algorithm in the IS model was developed for unstable and neutral stabilities.

Table 1: Building Downwash Analysis of 1-hour SO_2 Concentrations for Proposed Boiler 4 Firing Oil Bagasse at 225×10^6 Btu/hr with Remainder of Steam from Firing.*

Stability Class	Wind Speed (m/s)	With Building Downwash Assumptions		Without Building Downwash Assumptions	
		Concentration (ug/m^3)	Downwind Distance** (Km)	Concentration (ug/m^3)	Downwind Distance** (Km)
Very Unstable	1	256	0.80	256	0.80
	3	274	0.52	274	0.52
Unstable	1	154	1.70	154	1.70
	3	213	0.80	213	0.80
	5	236	0.58	215	0.62
Slightly Unstable	1	77	2.00	77	2.00
	3	227	1.10	190	1.40
	5	254	0.70	198	1.00
	10	248	0.43	170	0.80
Neutral	1	0	---	0	---
	3	142	2.00	79	2.00
	5	198	0.80	123	2.00
	10	282	0.43	116	1.50
	20	217	0.43	85	1.20
Slightly Stable	1	6	2.00	6	2.00
	3	128	0.43	20	2.00
	5	265	0.43	24	2.00
Stable	1	0	---	0	---
	3	252	0.43	1	2.00
	5	358	0.43	2	2.00

* SO_2 emission rate of 649.2 lb/hr

** Concentrations predicted for receptors at plant property out to 2 km downwind from the proposed boiler's stack.

Table 2: Building Downwash Analysis of 1-hour SO_2 and TSP Concentrations for Proposed Boiler 4 Firing Bagasse Only*

Maximum TSP conditions

Stability Class	Wind Speed (m/s)	With Building Downwash Assumptions: Concentrations (ug/m^3) SO_2	TSP	Downwind Distance** (Km)	Without Building Downwash Assumptions: Concentrations (ug/m^3) SO_2	TSP	Downwind Distance** (Km)
Very Unstable	1	43	26	0.80	43	26	0.80
	3	46	28	0.58	46	28	0.58
Unstable	1	23	14	2.00	23	14	2.00
	3	34	20	1.00	34	20	1.00
	5	39	23	0.62	36	22	0.70
Slightly Unstable	1	6	4	2.00	6	4	2.00
	3	30	18	1.60	30	18	1.60
	5	40	24	0.80	33	20	1.20
	10	46	28	0.43	31	19	0.80
Neutral	1	0	0	----	0	0	----
	3	8	5	2.00	8	5	2.00
	5	28	17	1.40	18	11	2.00
	10	51	31	0.43	20	12	1.70
	20	43	26	0.43	16	10	1.20
Slightly Stable	1	1	1	2.00	1	1	2.00
	3	21	13	2.00	3	2	2.00
	5	40	24	0.43	4	2	2.00
Stable	1	0	0	----	0	0	----
	3	34	20	0.43	0	0	----
	5	58	35	0.43	0	0	----

* SO_2 emissions = 136.4 lb/hr, Particulate emissions =81.8 lb/hr

** Concentrations predicted for receptors at plant property out to 2 Km downwind from the proposed boiler´s stack.

May 10, 1984

83-172-0100

U.S. Sugar Corporation Boiler No. 4

Expanded Building Downwash Analysis

The Good Engineering Practice (GEP) stack height analysis presented in Section 2.3.2 of the PSD report indicated that the stack for the proposed Boiler No. 4 will be less than GEP height. This evaluation demonstrated that the only structure at the Clewiston mill which has the potential to influence the proposed boiler's stack is the Boiling House building. This building is 90 feet high, 153 feet by 220 feet in width, and located about 300 feet from the proposed stack. Because of the Boiling House's orientation in relation to the proposed stack location, the stack is influenced by this building for only certain wind directions. These directions are approximately 110^{o} clockwise to 150^{o} and 290^{o} clockwise to 330^{o} (directions from north).

To further evaluate the potential effects of building downwash on the proposed boiler, a building downwash screening analysis was performed based on U.S. EPA's latest guidance (i.e. Regional Workshops on Air Quality Modeling: A Summary Report, December 1983). This consisted of evaluating the potential maximum ground-level concentrations within the cavity and wake regions of the Boiling House building.

According to EPA guidance, the cavity region extends up to a distance of 3L downwind from a building, where L is the lesser of the building height or projected width. Since the height of the Boiling House is 90 feet, which is less than either the length or width of the building, the cavity region extends up to 270 feet (i.e. 3 x 90 feet) downwind from the Boiling House. Therefore, the cavity region will not extend to the proposed boiler's stack, which is 300 feet away. Therefore, no further analysis is required because the stack will not be located within the cavity region of the Boiling House.

ATTACHMENT "F"

The wake region extends from 3L to 10L downwind from a building. Similar to the cavity region analysis, with L equal to 90 feet, the wake region extends from 270 to 900 feet from the Boiling House. The stack is located 300 feet from the Boiling House, and therefore, within that building's wake region. Based on the procedures presented in the EPA Summary Report, the following screening approach was used to evaluate building downwash effects on the proposed stack within the wake region:

1. Concentrations were calculated for a building height and projected width of 90 and 268 feet, respectively. The projected width is based on the diagonal of the building. For modeling purposes, the projected width was adjusted because the ISC model uses an effective building diameter for the building width.

2. The transitional plume rise option in the IS model was selected.

3. Receptors were located at plant property out to 2000 meters. The following distances were included: 426, 462, 522, 578, 623, and every 100m from 700 to 2000 m downwind from the proposed stack.

4. Hourly, ground-level plume centerline concentrations were calculated for a set of representative meteorological conditions, which consisted of 20 combinations of wind speed and atmospheric stability, mixing height of 5000m, and ambient temperature of 293 K.

The maximum hourly concentrations for each combination of meteorological condition are presented in Tables 1 and 2 for the proposed boiler firing oil and bagasse (SO_2 concentrations only), and bagasse only (SO_2 and TSP concentrations), respectively. In addition to the hourly concentrations predicted under building downwash conditions, concentrations are presented assuming building downwash conditions do not occur (i.e. Gaussian dispersion). In general, the highest concentrations for each stability occur under building downwash conditions for moderate to high wind speeds and at the nearest plant property. Under unstable and neutral conditions, the maximum 1-hour concentrations under building downwash conditions increase by up to a factor of two from those predicted without building downwash assumptions. For stable conditions, maximum 1-hour concentrations under building downwash conditions are much higher than those predicted without downwash conditions. However, the results for stable conditions are suspect since the building downwash algorithm in the IS model was developed for unstable and neutral stabilities.

Table 1: Building Downwash Analysis of 1-hour SO_2 Concentrations for Proposed Boiler 4 Firing Oil Bagasse at 225 X 10^6 Btu/hr with Remainder of Steam from Firing.*

Stability Class	Wind Speed (m/s)	With Building Downwash Assumptions: Concentration (ug/m^3)	With Building Downwash Assumptions: Downwind Distance** (Km)	Without Building Downwash Assumptions: Concentration (ug/m^3)	Without Building Downwash Assumptions: Downwind Distance** (Km)
Very Unstable	1	256	0.80	256	0.80
	3	274	0.52	274	0.52
Unstable	1	154	1.70	154	1.70
	3	213	0.80	213	0.80
	5	236	0.58	215	0.62
Slightly Unstable	1	77	2.00	77	2.00
	3	227	1.10	190	1.40
	5	254	0.70	198	1.00
	10	248	0.43	170	0.80
Neutral	1	0	---	0	---
	3	142	2.00	79	2.00
	5	198	0.80	123	2.00
	10	282	0.43	116	1.50
	20	217	0.43	85	1.20
Slightly Stable	1	6	2.00	6	2.00
	3	128	0.43	20	2.00
	5	265	0.43	24	2.00
Stable	1	0	---	0	---
	3	252	0.43	1	2.00
	5	358	0.43	2	2.00

* SO_2 emission rate of 649.2 lb/hr

** Concentrations predicted for receptors at plant property out to 2 km downwind from the proposed boiler's stack.

Table 2: Building Downwash Analysis of 1-hour SO_2 and TSP Concentrations for Proposed Boiler 4 Firing Bagasse Only*

Stability Class	Wind Speed (m/s)	With Building Downwash Assumptions: Concentrations (ug/m^3) SO_2	TSP	Downwind Distance** (Km)	Without Building Downwash Assumptions: Concentrations (ug/m^3) SO_2	TSP	Downwind Distance** (Km)
Very Unstable	1	43	26	0.80	43	26	0.80
	3	46	28	0.58	46	28	0.58
Unstable	1	23	14	2.00	23	14	2.00
	3	34	20	1.00	34	20	1.00
	5	39	23	0.62	36	22	0.70
Slightly Unstable	1	6	4	2.00	6	4	2.00
	3	30	18	1.60	30	18	1.60
	5	40	24	0.80	33	20	1.20
	10	46	28	0.43	31	19	0.80
Neutral	1	0	0	----	0	0	----
	3	8	5	2.00	8	5	2.00
	5	28	17	1.40	18	11	2.00
	10	51	31	0.43	20	12	1.70
	20	43	26	0.43	16	10	1.20
Slightly Stable	1	1	1	2.00	1	1	2.00
	3	21	13	2.00	3	2	2.00
	5	40	24	0.43	4	2	2.00
Stable	1	0	0	----	0	0	----
	3	34	20	0.43	0	0	----
	5	58	35	0.43	0	0	----

* SO_2 emissions = 136.4 lb/hr, Particulate emissions =81.8 lb/hr

** Concentrations predicted for receptors at plant property out to 2 Km downwind from the proposed boiler´s stack.

No. 0156521

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED— NOT FOR INTERNATIONAL MAIL

(See Reverse)

SENT TO Mr. A. R. Mayo	
STREET AND NO.	
P.O., STATE AND ZIP CODE	
POSTAGE	$
CERTIFIED FEE	¢
SPECIAL DELIVERY	¢
RESTRICTED DELIVERY	¢
SHOW TO WHOM AND DATE DELIVERED	¢
SHOW TO WHOM, DATE, AND ADDRESS OF DELIVERY	¢
SHOW TO WHOM AND DATE DELIVERED WITH RESTRICTED DELIVERY	¢
SHOW TO WHOM, DATE AND ADDRESS OF DELIVERY WITH RESTRICTED DELIVERY	¢
TOTAL POSTAGE AND FEES	$
POSTMARK OR DATE 6/21/84	

CONSULT POSTMASTER FOR FEES — OPTIONAL SERVICES — RETURN RECEIPT SERVICE

PS Form 3800, Apr. 1976

PS Form 3811, Jan. 1979

RETURN RECEIPT, REGISTERED, INSURED AND CERTIFIED MAIL

SENDER: Complete items 1, 2, and 3.
Add your address in the "RETURN TO" space on reverse.

1. The following service is requested (check one.)
   - [x] Show to whom and date delivered.............. ¢
   - [ ] Show to whom, date and address of delivery... ¢
   - [ ] RESTRICTED DELIVERY
     Show to whom and date delivered.............. ¢
   - [ ] RESTRICTED DELIVERY.
     Show to whom, date, and address of delivery.$____

   (CONSULT POSTMASTER FOR FEES)

2. **ARTICLE ADDRESSED TO:**
   Mr. A. R. Mayo
   Post Office Box 1207
   Clewiston, FL 33440

3. **ARTICLE DESCRIPTION:**

REGISTERED NO.	CERTIFIED NO.	INSURED NO.
	0156521	

(Always obtain signature of addressee or agent)

I have received the article described above.

SIGNATURE ☐Addressee ☐Authorized agent

4. Blake Wilson

DATE OF DELIVERY 6/25/84

POSTMARK CLEWISTON, FL JUN 25 1984 USPO

5. **ADDRESS (Complete only if requested)**

6. **UNABLE TO DELIVER BECAUSE:**

CLERK'S INITIALS

☆GPO : 1979-300-459

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

June 22, 1984

CERTIFIED MAIL - RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
United States Sugar Corporation
P. O. Box 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

The department has reviewed the June 1, 1984, response by your attorney to our March 3, 1984, letter requesting additional information on the proposed No. 4 bagasse boiler. Although your response answered most of the questions asked, there are several outstanding issues that need clarification before we process this application. Please submit the information listed below at your earliest convenience.

1. To determine what regulations are applicable, the department needs to know what components (and their cost) of the boiler system were purchased from Central Illinois Gas & Electric Company, what components were purchased new (and their total cost), and what would be the cost of a equivalent new boiler system?

2. To provide assurance that the heat input from fossil fuel cannot exceed 250 million Btu/hr, the department needs drawings and specifications on the oil guns and their nozzles along with a piping diagram, which includes the pipe size, of the proposed gun installations. What is the maximum capacity (GPM) of each oil gun at the maximum pressure that can be developed by the fuel oil pumps? Will two of the four oil gun ports be welded shut or altered to prevent the installation of more than two oil burners in the boiler?

3. What method is used by your plant to determine percent moisture in the bagasse?

4. What is the lowest moisture content measured or anticipated in the reclaim bagasse storage pile? Does your Company take any precautions to minimize fugitive dust when bagasse is reclaimed from the storage pile?

5. Please furnish a drawing of the peripheral nozzle venturi that shows the details of the adjustable weirs along the bottom edge of the venturi and note the number of these weirs that will be in the venturi.

As soon as we receive the information requested above, we will resume processing your application. If you have any questions on this matter, please write me or call Willard Hanks at (904)488-1344.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/WH/s

cc: P. Cunningham
D. Buff
D. Knowles

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTH FLORIDA
DISTRICT

**2269 BAY STREET
FORT MYERS, FLORIDA 33901-2896**

DEPARTMENT OF ENVIRONMENTAL REGULATION
STATE OF FLORIDA

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PHILIP R. EDWARDS
DISTRICT MANAGER

April 18, 1984

CERTIFIED MAIL #P566 417 381
RETURN RECEIPT REQUESTED

DER
APR 20 1984
BAQM

A. R. Mayo, Vice President
U. S. Sugar Corporation
Post Office Drawer 1207
Clewiston, FL 33440

Re: Hendry County - AP
Boiler #4
OGC Case No. 84-0225

Dear Mr. Mayo:

Enclosed is the signed and entered Consent Order to resolve the above referenced case. This copy is for your records.

Please note that all compliance dates begin from the date of entry of this Order which is April 18, 1984.

Upon receipt of the settlement mentioned and satisfactory completion of all conditions of the Order, we will close this case and place it in our inactive file.

Your cooperation in resolving this case is appreciated.

Sincerely,

Langley Adair

Langley Adair
Enforcement Officer

Enclosure

LA/jw

cc: File
Wali Kharif

BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION	)	
Complainant,	)	
vs.	)	OGC CASE NO.: 84-0225
U. S. SUGAR CORPORATION,	)	
Respondent.	)	

CONSENT ORDER

This Consent Order is made and entered into between the State of Florida Department of Environmental Regulation ("Department") and U. S. Sugar Corporation, ("Respondent"), Post Office Drawer 1207, Clewiston, Florida 33440.

The Department finds and Respondent admits the following:

1. The Department is the administrative agency of the State of Florida responsible for the protection of air and water resources and for the administration and enforcement of the Florida Air and Water Pollution Control Act, Chapter 403, Florida Statutes, and the rules promulgated thereunder, Florida Administrative Code Chapter 17.

2. Respondent is a Florida corporation engaged in the business of harvesting and processing sugar cane. Respondent operates a sugar cane processing facility at W. C. Owens Avenue and Clewiston Street in Clewiston, Florida. This facility (known as the "Clewiston Mill") currently utilizes (among other units) two steam generating boilers (Units No. 5 and No. 6) with combined steam capacity of 150,000 lb/hr fired by bagasse; both of these boilers have valid operating permits from the Department.

3. On February 3, 1984, the Department received from Respondent an application for a permit to construct a new bagasse/oil-fired boiler with a steam generating capacity of 250,000 lb/hr (Unit No. 4.).

4. While the permitting procedure was still pending and before receiving a construction permit, Respondent began site preparation and foundation work on Unit No. 4 at the Clewiston Mill. Commencing construction of a new source without a valid permit from the Department is in violation of Section 403.087, Florida Statutes, and Florida Administrative Code Rule 17-2.210(1).

The Department and the Respondent having met to discuss the violation and having reached a mutually agreeable settlement of the above referenced matters, pursuant to Florida Administrative Code Rule 17-1.58(3), it is therefore

AGREED AND ORDERED

5. Within ten days from the effective date of this Consent Order, Respondent shall pay to the Department the sum of $20,000 in the form of a cashier's check or money order made payable to the Department's Pollution Recovery Fund. Payment shall be submitted to the Department's South Florida District Office, 2269 Bay Street, Fort Myers, Florida 33901.

6. Respondent may continue construction of the new steam generating boiler at the Clewiston Mill under the following conditions:

a. Respondent shall not operate the new boiler, even for purposes of testing, without having received a valid construction permit from the Department. Routine operation will require receipt of a valid operation permit from the Department.

b. Assuming that Respondent has the appropriate permits to operate the new source, Respondent shall not operate Units No. 5 and No. 6 simultaneously with the new boiler during the sugar cane processing season beginning in the fall of 1984 (approximately October 1984 through April 1985), except for periods of limited performance evaluation or emission testing. In addition, any simultaneous operation of Units No. 5 and No. 6 during this same sugar cane processing season with the new boiler shall not result in combined steam generating capacity exceeding 250,000 lb/hr.

c. Construction of the new steam boiler without having received a construction permit from the Department will be entirely at the risk of Respondent. In allowing construction to proceed, the Department does not make any inference that the Respondent's construction permit application will be approved. Denial of the construction permit or issuance of the construction permit with conditions may require substantial expenditures by Respondent to either remove or modify the new steam boiler.

d. Respondent shall submit any additional required information necessary to complete the permit application to the Central Air Permitting Sections (CAPS) within a reasonable time. Failure to submit said information in a timely manner may constitute grounds to deny the permit application.

7. Respondent shall allow authorized representatives of the Department access to the property at reasonable times for purposes of determining compliance with this Consent Order and the rules of the Department.

8. The Department hereby expressly reserves the right to initiate appropriate legal action to prevent or prohibit the future violation of applicable statutes, or the rules promulgated thereunder.

9. The Department, for and in consideration of the complete and timely performance by Respondent of the obligations agreed to in this Consent Order, hereby waives its right to seek judicial imposition of damages, or civil or criminal penalties for the alleged violation outlined in this Consent Order. Respondent waives its right to a hearing or judicial review of the terms of this Order.

10. Entry of this Consent Order does not relieve Respondent of the need to comply with applicable federal, state, or local laws, regulations, or ordinances. The entry of this Consent Order does not abrogate the rights of substantially affected persons who are not parties to this Order, pursuant to Chapter 120, Florida Statutes.

11. The terms and conditions set forth in the Consent Order may be enforced in a court of competent jurisdiction pursuant to Sections 120.69 and 403.121, Florida Statutes. Failure to comply with terms of this Consent Order shall constitute a violation of Section 403.161(1)(b), Florida Statutes.

12. Respondent is fully aware that a violation of the terms of this Consent Order may subject Respondent to judicial imposition of damages, civil penalties of up to $10,000 per offense, and criminal penalties.

13. This Consent Order shall take effect upon the date of filing and acknowledgement by the Clerk of the Department and shall constitute final agency action by the Department pursuant to Section 120.69, Florida Statutes and Florida Administrative Code Rule 17-1.58(3).

FOR THE RESPONDENT:

April 17, 1984
DATED

A. R. Mayo
A. R. MAYO
Vice President

Post Office Drawer 1207
Clewiston, Florida 33440

DONE AND ORDERED this 18th day of April, 1984, in Fort Myers, Florida.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to S 120.52 (9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Jo Witte
CLERK

04-18-84
DATE

FOR THE DEPARTMENT:

Philip R. Edwards
PHILLIP R. EDWARDS
District Manager

South Florida District
2269 Bay Street
Fort Myers, Florida 33901

DRAFT 3/28/84

U.S. SUGAR CORPORATION'S RESPONSE TO DER QUESTIONS ON AIR PERMIT APPLICATION FOR PROPOSED BOILER NO. 4 AT CLEWISTON SUGAR MILL

Response to Questions 1 and 8

As stated in the permit application, the maximum fuel oil heat input to the proposed boiler will not exceed 250 x 10^6 BTU/hr. The design of the boiler will preclude the exceedance of this rate. The fuel oil firing system, including burner guns, piping, pumps, controls and oil heater, will limit the heat input to 250 x 10^6 BTU/hr and the boiler will not be capable of firing fossil fuel at a rate greater than 250 x 10^6 BTU/hr. Similar circumstances were present in connection with Bryant Boiler No. 5 when it was permitted, and it was determined by DER that if such limitations were placed on the boiler, the Subpart D NSPS would not apply. U.S. Sugar will accept permit restrictions on the maximum fossil-fuel heat input to the proposed boiler to ensure the non-applicability of the Subpart D NSPS.

Response to Question 2

The additional steam capacity from the new boiler will be used to burn the surplus bagasse from the Clewiston mill which is now being sold to the Quaker Oats Co. at Belle Glade. This surplus bagasse is now being used by Quaker Oats in the manufacture of furfural and the resulting bagasse residue is then sent to Sugar Cane Grower's Cooperative's Glade Mill and burned as sulfur containing residue at that Mill's boilers. Our contract with Quaker Oats has now terminated. The additional steam capacity from the new boiler will also provide for possible additional milling capacity at U.S. Sugar's Clewiston Mill in the future.

Response to Question 3

No additional process equipment is initially intended to be installed in connection with this boiler.

Response to Question 4

This boiler is intended primarily to provide additional process steam to improve factory recovery performance in the extraction of sucrose. It will also provide additional power generating capacity as its steam is reduced from boiler operating pressure to process pressure in existing turbine generator sets. The new boiler will provide steam to produce an estimated 4 to 5 thousand kilowatts of additional electricity for sale. Rated electrical generating capacity for the entire Clewiston mill is currently 17,500 kilowatts. Actual maximum electrical generating capacity based upon steam availability is currently about 11,500 kilowatts. The addition of a new boiler will increase the actual maximum capacity to about 16,000 kilowatts.

Response to Question 5

Components of this unit are presently located at the Clewiston mill site. It was originally installed and operated at the Central Illinois Gas and Electric Co. at Rockford, Illinois. It was built in 1953 and, according to information provided to U.S. Sugar Coop., was operated initially on gas and coal and later was converted to fuel oil. As far as we know there was no emission control equipment on this boiler at Central Illinois. We have no information regarding environmental permits or emission levels for this boiler when operated in Illinois.

Response to Question 6

The varying combustion qualities of bagasse, resulting from changes in its moisture content and varying amount of soil and other extraneous material present in the cane, make it impossible to maintain a given level of efficiency in a bagasse burning boiler. This and the great difficulty of measuring bagasse flow have caused DER to previously agree with the sugar cane industry in the use of 55% as a reasonable boiler efficiency for the determination of heat input. An efficiency range of 50% to 60% is expected for this unit, when burning bagasse.

Response to Question 7

250,000 lbs of steam per hour or 545.5 million Btu/hr heat input is the anticipated maximum capacity of this boiler. It is not anticipated that this capacity will be exceeded. Steam production for the new boiler will be monitored to ensure that the 250,000 lb per hour level is not exceeded.

Response to Question 8

See response to Question 1.

Response to Question 9

The 375,000 gallon per year of fuel oil usage for the Clewiston mill, cited on page 1-6, is an approximate figure for all of the boilers. As shown in Table 2-5, the actual average oil consumption for all boilers in 1981 and 1982 was 378,050 gallons. This figure does not include the pellet plants. The pellet plants did not operate in 1982, and averaged 91,440 gallons per year of fuel oil consumption during their last two years of operation, 1980-1981, with 134,576 gallons burned in 1981 (See Appendix I of PSD Report). Total fuel oil consumption at the entire plant for 1981-1982, including the pellet plants, averaged 445,338 gallons per year. The variation in the pellet mill's fuel useage for 1979 versus 1982 was due to an increase in production reflecting the operation of either one or two dryers at one time. As stated in the application, the pellet plants will not be operated in the future.

Response to Question 10

The average cost per gallon of No. 6 oil containing 2.5 percent sulfur for 1979 thru 1984: 1979 - 50¢, 1980 - 58¢, 1981 - 69¢, 1982 - 64¢, 1983 - 65¢, and 1984 - 72¢.

Response to Question 11

According to price quotations recently obtained from Belcher Oil Co., the current delivery cost of No. 6 fuel oil is:

Containing 2.5 percent sulfur - 72¢/gallon
Containing 2.0 percent sulfur - 79¢/gallon
Containing 1.5 percent sulfur - 83¢/gallon
Containing 1.0 percent sulfur - 80¢/gallon

Response to Question 12

Information requested on the fuel meters for the different boilers is as follows:

Boilers 1 & 2 - Bailey Meter Co.
Type - JR. 1323A - Style IA22
Model AO-1, S/N 633015-16
Purchased - 1968
Last Calibration - November 1983

Boiler 3 - Bailey Meter Co.
Type CS1, WSC - S/N-100335T&R
Purchased - 1944
Last Calibration - November 1983

All fuel meters function as designed. Daily records of oil consumption are recorded and logged by boiler.

Response to Question 13

There are by-passes on the fuel oil meters. A sketch is being provided.

Response to Questions 14 & 15

The 1974 manufacturer's guarantee indicates that the scrubber should be 95 percent efficient for particulate matter (PM), but this is contingent upon an inlet grain loading to the scrubber of 1 gr/DSCF. Very few test results are available for bagasse burning boilers at the inlet to the scrubber, or for uncontrolled boilers. As a result, it is not possible to substantiate the stated efficiency for the industry scrubbers. A theoretical efficiency can be estimated using the EPA AP-42 uncontrolled emission factor for PM and the proposed PM emission limit. The EPA factor is 16 lb/ton of wet bagasse fired, or for the proposed boiler, 1212 lb/hr. Based upon the proposed 0.2 lb/10^6 BTU emission limit, actual emissions are 109.1 lb/hr. This equates to a 91 percent efficiency. The spray impingement scrubbers in the sugar cane industry have not met the original warranty level of 0.05 gr/DSCF. This fact was acknowledged by DER when it first evaluated this control device for the industry and accepted it as BACT. U.S. Sugar Corporation was the first mill to install this type scrubber, and was therefore intimately involved in the initial design, installation, operation and maintenance of the scrubbers. The proposed spray impingement scrubber will be the same design as presented in the manufacturers literature contained in the application. It will be built by an independent shop according to drawings provided by U.S. Sugar Corporation. It will be equal in size to the Bryant #5 scrubber. As such, no warranty is available. The proposed emission limit is based upon years of operating experience, which is much more useful than a paper guarantee based upon theoretical conditions which may never be experienced under field conditions.

There exists no known method of increasing the efficiency of the spray impingement scrubber. In regard to increasing the pressure drop, the first point is that the manufacturer has recommended that the scrubber be operated between 5 inches and 9 inches pressure drop. Secondly, U.S. Sugar has been recording scrubber pressure drops during PM compliance tests since 1981 at the request of DER. The data show no relationship between pressure drop and PM emissions at pressure drops above 5 inches H_2O. Higher emission rates (lb/MMBtu heat input) have been exerienced at pressure drops of 7.5 inches than have been recorded at 5.0 inches of pressure drop.

The venturi scrubber as an alternate PM control method was discussed thoroughly in the permit application. Several such scrubbers are in operation in the industry. Despite much higher pressure drops on these scrubbers (i.e. 25 inches), test data demonstrate the venturi does not achieve any greater removal efficiency then the impingement scrubber design.

Response to Question 16

The scrubber will be equipped with an adjustable overflow weir for continuous overflowing to regulate the water level in the scrubber. Since more water is normally added through the sprayer than is evaporated, the overflow will control the level within the scrubber. Additionally, a low level alarm for abnormal low water conditions will be provided. Water flow to the sprays is determined by the water pressure on the header. This pressure will be monitored. A water manometer will be installed on the scrubber to monitor pressure drop across the scrubber.

Response to Question 17

The scrubber water will not be recirculated. Fresh makeup water will be drawn from the mill supply channel, and scrubber bleed-off water will be discharged to a settling pond. In order to assure that the scrubber inlet water remains at a pH of about 7 or above 8, U.S. Sugar will periodically measure the scrubber inlet pH. During the first crop season of operation of the new boiler, it is proposed that the measurement be made weekly, and if these measurements indicate a relatively constant level, that the measurement frequency be reduced to monthly for subsequent crop seasons. However, it is emphasized that the alkaline nature of the bagasse fly ash acts to increase or maintain the pH of the scrubber water. Therefore, the inlet water to the scrubber is not necessarily an accurate indication of SO_2 removal potential of the scrubber.

Response to Question 18

It is feasible to add an alkaline solution to the water. However, there is no evidence that doing this would increase SO_2 removal. As discussed in the response to Question 17, the scrubber water is already very alkaline in nature. The available test data, presented in the application, indicate that better than 95 percent SO_2 removal is already obtained by the proposed BACT system (impingement scrubber). A 50 percent SO_2 removal efficiency was assumed in the application to be conservative. There is no need to add a costly alkaline solution to the scrubber liquid when removal efficiencies are already extremely high for bagasse burning. The small amount of fuel oil anticipated to be burned in the proposed boiler does not justify additional measures to reduce SO_2 emissions from fuel oil burning.

Response to Question 19

This scrubber will be equipped with a rotating water spray in its demister section to wash the spin vanes. Additionally, manholes and handholes will be provided at specific areas (spin vane section, bottom core, around periphery of the scrubber throat) for rodding and unplugging while the scrubber is in service. It should be noted that the location proposed for installation of this scrubber, before the induced draft fan, will allow cleaning and unplugging while operating due to the fact that it is under sub-atmospheric pressure. A scrubber construction drawing was submitted with the application with all pertinent information. It should be emphasized that the applicant has very great interest and motivation to avoid plugging of the scrubber, as it reduces the boiler efficiency and impedes the steam production capacity of the boiler. The scrubber for the proposed boiler will be identical in size and design to the Bryant Boiler No. 5 scrubber and will differ from other existing scrubbers only in size. Dimensions for the existing scrubbers are as follows:

Clewiston Boilers 1 & 2	- 17' diameter, 39' height
Clewiston Boiler 3	- 14' diameter, 32.5' height
Bryant Boiler 5	- 19' diameter, 42' height

Response to Question 20

None of the scrubbers in operation at the Clewiston mill have bypass around the scrubbers. Therefore, when the boilers are in operation the exhaust gasses must pass through the scrubber. Therefore, no boiler has been operated without a scrubber being in service.

Response to Question 21

Engineering of the stack has not yet been completed. Suitable access to the sampling platform (i.e. caged ladder) will be provided in accordance with OSHA requirements and Florida Administrative Code Rule 17-2.700(4). The location of the sampling ports will meet the criteria of eight stack diameters downstream from the nearest flow disturbance and two stack diameters upstream from the nearest flow disturbance.

Response to Question 22

The average moisture content of the bagasse (55%) will in itself minimize any fugitive emissions of bagasse due to bagasse handling operations. As such, emissions of fugitive bagasse are expected to be minimal. Fugitive particulate emission factors for bagasse handling have not been developed, and therefore quantification is not possible. As a result of the operation of proposed Boiler 4, bagasse handling operations will actually decrease and the on-site bagasse storage pile will be reduced significantly. This is because excess bagasse which currently cannot be used at the Clewiston mill is conveyed to an outside storage pile, then loaded by payloader into trucks for shipment to Quaker Oats Company. Quaker Oats manufactures furfural from the bagasse and sends the resulting bagasse residue to Sugar Cane Growers Coop. for burning in their boilers. In 1983, approximately 40,000 tons of bagasse was shipped to Quaker Oats. Upon start-up of the proposed boiler, shipment of excess bagasse to Quaker Oats will be discontinued, and bagasse will be routed from the sugar cane mills directly to the boiler. This will eliminate the conveying, storage, reclaiming, and shipping operations currently necessary for the excess bagasse. Thus, fugitive bagasse emissions will be reduced as compared to present operations.

Response to Question 23

Latitude and longitude are correct as stated.

Response to Question 24

The plant site is completely surrounded by a fence except to the southeast, where sugar cane fields border the site. The point of nearest public access is approximately 400 meters west of the boilers outside the fence.

Response to Question 25

The SO_2 and ozone air quality data collected by FSCL is not available at this time. Ambient air quality concentrations of ozone were not assumed in the application, since ozone impacts cannot be accurately estimated. Since SO_2 data are not available, no comparisons can be made between these data and the SO_2 air quality levels assumed in the application.

Response to Question 26

We are enclosing fan performance data in lieu of the curve requested.

Response to Question 27.

See attached letter from Florida Sugar Cane League dated March 21, 1984.

Response to Question 28

The maximum SO_2 impacts for Boiler No. 4 presented in the PSD report reflect maximum fuel oil burning conditions for each day of the crop year (184 days). As stated in the report, these impacts are considered to be conservative since fuel oil burning in the boiler will be limited to 500,000 gallons per year, or less than 14 days per crop year at the maximum fuel oil burning rate. Fuel oil usage in the boiler will be minimized because of the costly nature of burning this fuel (bagasse is a waste product and represents free fuel). For this reason, SO_2 impacts while burning all bagasse in the boiler are considered to be more representative of actual ambient impacts. Under these conditions, highest, second-highest 24-hour SO_2 impacts are predicted to be 10 ug/m^3 (obtained by multiplying the maximum PM impact of 8 ug/m^3 by the ratio of SO_2 to PM emissions: 136.4 - 109.1). This SO_2 impact level is well below the PSD de minimis impact level of 13 ug/m^3, 24-hour average. Based upon these considerations, it is requested that U.S. Sugar Corporation be exempted from the PSD preconstruction monitoring requirements for SO_2. Ambient ozone data for the FSCL monitors are not presently available.

Response to Comment 29

Based upon the GEP analysis presented in Section 2.3.2 of the PSD report, the only structure at the Clewiston mill which has the potential to influence the Boiler No. 4 stack is the Boiling House. This building is 90 feet tall and 153 feet by 220 feet in width. Because of the Boiler House's orientation in relation to the proposed Boiler No. 4 stack location, only certain wind directions will influence the stack. These directions are approximately 110° to 150° and 290° to 330° (clockwise from North).

Although there is a potential for building downwash conditions to occur for these directions, several factors indicate that the frequency and magnitude of the maximum concentrations produced under building downwash conditions are expected to be minimal.

The proposed Boiler No. 4 stack will be located about 300 feet from the Boiling House, and, therefore, less likely to be under the influence of the building downwash effects than if it were located on or immediately adjacent to the building. Also, most air dispersion models that evaluate building downwash conditions, e.g. ISC model, assume that the stack is on or adjacent to a building. Therefore, application of these models to evaluate building downwash effects for stacks located away from a building is not appropriate for estimating maximum ground-level concentrations.

To estimate the frequency of potential building downwash conditions occurring at the plant site, meteorological data collected at the National Weather Service Station in West Palm Beach were reviewed. The frequency of meteorological conditions which are likely to produce building downwash conditions are low, occurring less than 6 percent of the time for a particular wind direction on an annual average basis. For example, the annual average frequencies of wind directions for all atmospheric stabilities from the east-southeast and southeast (which will influence the stack emissions for directions towards 110° to 150°) are 10.2 and 8.2 percent, respectively. However, because building downwash conditions are most likely to occur for neutral to slightly unstable stabilities, the annual average frequencies of these stabilities occurring for east-southeast and southeast wind directions are 6 and 5 percent, respectively. In fact, because building downwash conditions generally occur for moderate to high wind speeds, the potential for building downwash conditions to occur for these wind directions is even lower than the indicated frequencies.

For other wind directions for which building downwash conditions may occur (i.e., west-northwest and northwest), the annual average frequencies for all atmospheric stabilities are less than 6 percent and for neutral and slightly unstable stabilities (i.e. conditions conducive to building downwash) are less than 4 percent.

The maximum SO_2 emissions are emitted when Unit 4 is firing oil, an operating mode which will occur for a maximum duration equivalent to 14 days during the year. Therefore, the joint frequency of meteorological conditions that may produce building downwash effects and the occurrence of worst-case SO_2 emissions is extremely low. For example, the joint frequency of east-southeast wind directions for all atmospheric stability classes and worst-case SO_2 emissions is 0.23 percent on an annual average basis (i.e. 6 percent times 14/365 days). The joint frequency of building downwash conditions occurring for other wind directions and worst-case SO_2 emissions is even lower.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

DER
MAR 20 1984
BAQM

4AW-AM

Mr. C. H. Fancy, Deputy Chief
Bureau of Air Quality Management
Florida Division of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32307

Dear Mr. Fancy:

This letter is in reply to your letter of February 13, 1984, regarding application of NSPS to a 160 MW bagasse fired steam generator. As we understand the situation, a new 160 MW steam generator was originally designed and manufactured to fire coal or natural gas. Before being placed in service, the boiler is to be modified to fire bagasse and residual oil and the owner intends to limit residual oil consumption below 73 MW heat input.

This boiler would be considered subject to Subpart D of 40 CFR 60 if it has the capability of firing fossil fuel at a heat input rate of more than 73 megawatts. A limitation on the consumption rate of fossil fuel by way of a permit condition would not exempt the facility from NSPS. In order for the boiler to be exempted from NSPS, it would have to undergo a derating through a permanent physical change which would preclude it from operating at a fossil fuel input rate of more than 73 MW. It has previously been determined that solely limiting fossil fuel input by way of smaller pumps, pipes, or orifices does not qualify as a derating since it would be relatively easy to increase the feed rate to boiler at a later date. As stated above, we must emphasize that derating must be accomplished through a permanent physical change to the affected facility (boiler) which will preclude it from operating at a capacity greater than the derated value (under 73 MW heat input). An acceptable method of derating, for example, would involve a switch to a smaller fan whose capacity would be less than the gas flow corresponding to 73 MW. It should be noted that each derate is evaluated on an individual basis and we would be willing to review any derate proposal which is ultimately submitted to your agency. The above discussion covers questions A and C on page 2 of your letter.

With regard to question B, NSPS would still apply if an NSPS boiler is relocated and modified to burn non-fossil fuels, assuming it was still capable of firing more than 73 MW heat input of fossil fuel.

Although you did not specifically ask for guidance with respect to application of the specific emission limits in Subpart D, I would like to briefly clarify several points. You will note that the emission standards for particulate, sulfur dioxide and nitrogen oxides are expressed in lbs per million BTU derived from fossil fuel and wood residue. Therefore, when burning bagasse in conjunction with fossil fuel, the specific NSPS emission limits for the above pollutants would not be applicable since bagasse is not a fossil fuel or wood residue. Therefore, we suggest that separate emission limits for bagasse firing (alone or in conjunction with fossil fuel) be established and incorporated into the required PSD permit. A similar situation occurred at U.S. Sugar Corporation's Bryant Mill (Boiler #5) and we are enclosing EPA's Final Determination and letter of August 30, 1979, to U.S. Sugar for your information.

If you need additional assistance with regard to this matter, please call Brian Beals of my staff at 404/881-4901.

Sincerely yours,

James T. Wilburn, Chief
Air Management Branch
Air & Waste Management Division

AUG 30 1979

REF: 4AH-AP

Mr. A.F. Mayo
Vice President
U.S. Sugar Corporation
Post Office Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

Review of your May 11, 1978, application to construct Boiler No. 5 at your Bryant Mill has been completed. The construction is subject to rules for the Prevention of Significant Air Quality Deterioration (PSD), contained in 40 CFR 52.21.

We have determined that the construction, as described in the application, meets all applicable requirements of the PSD regulations, subject to the conditions in the Final Determination (enclosed). EPA performed a Preliminary Determination concerning the proposed construction, and published a request for public comment on June 20, 1979. No comments were received except for those from William H. Green, U.S. Sugar's Counsel. The permit conditions have been modified in response to some of the comments in Mr. Green's letter for the facility described above, subject to the conditions in the Final Determination. This Authority to Construct is based solely on the requirements of 40 CFR 52.21, the federal regulations governing significant deterioration of air quality. It does not apply to NPDES or other permits issued by this agency or permits issued by other agencies. Information regarding EPA permitting requirements can be provided if you contact Mr. Joe Franzmathes, Director, Office of Program Integration and Operations, at (404)881-4737. Additionally, construction covered by this Authority to Construct must be initiated within 18 months from the receipt of this letter.

The United States Court of Appeals for the District of Columbia Circuit issued a ruling in the case of Alabama Power Co. vs. Douglas M. Costle (78-1006 and consolidated cases) which has significant impact on the EPA prevention of significant deterioration (PSD) program and permits issued thereunder. Although the court has stayed its decision pending resolution of petitions for reconsideration, it is probable that the final decision will require modification of the PSD regulations and could affect permits issued under the existing program. Examples of potential impact areas include the scope of the best available control technology requirement (BACT), source applicability, the amount of increment available (baseline definition), and the extent of preconstruction monitoring that a source may be required to perform. The applicant is hereby advised that this permit may be subject to reevaluation as a result of the terms of the final court decision and its ultimate effect.

1 Please be advised that a violation of any condition issued as part of this approval, as well as any construction which proceeds in material variance with information submitted in your application will be subject to enforcement action.

Authority to Construct will take effect on the date of this letter. The complete analysis which justifies this approval has been fully documented for future reference, if necessary. Any questions concerning this approval may be directed to Mr. Ray Cunningham, Chief, Air Strategy Development Section (404/881-3286).

Sincerely yours,

Thomas W. Devine
Director
Air & Hazardous Materials Division

Enclosure

cc: Dr. J.P. Subramani, Chief
Division of Environmental Programs

BWagner:jh:3286:8/20/79

4AH-AP Wagner	4AH-AP Cunningham	4AH-AP W. Smith	4AH Devine
8/28		for 8/29	8/30/79

Final Determination

Review of a Proposed Air Pollution Source Pursuant to Environmental

Protection Agency Rules for the Prevention of Significant Deterioration (PSD)

40 CFR 52.21

Bagassee Boiler #5

U.S. Sugar Corporation-Bryant Mill

Palm Beach County, Florida

U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30308

August, 1979

I. Introduction

U.S. Sugar Corporation has applied to the U.S. Environmental Protection Agency to construct a bagasse/oil-fired steam boiler with a maximum rated capacity of 250,000 pounds of steam per hour while firing 145,000 lb/hr of bagasse at a heat input rate of 522.7 million BTU per hour. Although bagasse will be the primary fuel, about 500,000 gallons per year of #6 fuel oil will be burned. Surplus steam will be used to generate excess power which will be sold to an electric power utility. The boiler will be constructed at the Bryant Sugar Mill in Bryant, Florida. The proposed construction is subject to review under 40 CFR 52.21, Regulations for the Prevention of Significant Deterioration (PSD). Under these regulations, a new source or modification to a source of air pollution which will increase the emissions potential of that source by more than 250 tons per year of any pollutant is subject to review for each of those pollutants. The proposed bagasse boiler has the potential to emit greater than 250 tons per year of particulate matter.

Paragraph (r) of the PSD regulations requires, in part, that EPA issue a Final Determination whether the source should be approved, approved with conditions, or disapproved. It is the decision of EPA that the source should be approved with conditions. The conditions are included to insure that the applicant complies with emission control techniques and emission limits which are a part of the application. The conditions of approval follow on the next page.

Conditions of Approval

1. <u>For Particulate Emissions from the Boiler:</u>

A. The source must meet an emission limit, as measured under part (B) as follows:

Particulate matter emitted to the atmosphere from the boiler shall not exceed:

Mode of Firing	Pounds/Million BTU Heat Input
Bagasse	0.15
Oil	0.10
Oil/Bagasse	(0.15 x % bagasse(BTU basis) + 0.1 x % oil(BTU basis)) ÷ 100

B. Emission Testing

a. Within 60 days after achieving the maximum production rate at which the facility will be operated, but no later than 180 days after initial startup, the owner or operator shall conduct performance tests and furnish EPA a written report of the results of such performance tests. Performance tests shall be conducted for the 3 modes of boiler operation (i.e., bagasse, oil, oil/bagasse).

b. Performance tests shall be conducted and data reduced in accordance with methods and procedures specified by EPA. Reference Methods 1 through 5 as published in Appendix A of 40 CFR 60 will be used for particulate tests.

c. Performance tests shall be conducted under such conditions as EPA shall specify based on representative performance of the facility. The owner or operator shall make available to EPA such records as may be necessary to determine the conditions of the performance tests.

d. The owner or operator shall provide EPA 30 days prior notice of the performance test to afford the opportunity to have an observer present.

e. The owner or operator shall provide or cause to be provided, performance testing facilities as follows:

   i. Sampling ports adequate for test methods applicable to the facility

   i. Safe sampling platform(s).

   iii. Safe access to sampling platform(s).

   iv. Utilities for sampling and testing equipment.

f. Each performance test shall consist of three separate runs using the applicable test method. Each run shall be conducted for the time and under the conditions specified by EPA. For the purpose of determining compliance with an emission limitation, the arithmetic mean of results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances beyond the owner or operator's control, compliance may, upon the approval of EPA, be determined by using the arithmetic mean of the other two runs.

2. For Sulfur Dioxide Emission from the Boiler

A. The sulfur content of the fuel oil shall not exceed 0.7 percent by weight.

B. The boiler shall not burn more than 400,000 gallons of fuel oil per year and 226,500 tons of bagasse per year.

C. The boiler shall be restricted to 150,000 pounds of steam per hour while burning oil.

3. Miscellaneous Conditions

A. Accurate records of the hours the boiler is operated and the amount of bagasse and oil usage shall be kept at the plant and are to be available for inspection at all times.

B. In order to alert EPA when the limitations in Condition 2B are in jeopardy of being exceeded, the applicant shall notify EPA, in writing, within 5 calendar days after the total hours of operation of the boiler in any calendar year exceed 3500.

II. Background

On May 11, 1978, the U.S. Sugar Corporation submitted an application to EPA under the PSD regulations to construct the new bagasse boiler #5 at the Bryant Mill. The application was considered complete. However, further information concerning BACT was submitted (September 11, 1978 and February 12, 1979). Meetings with the applicant were held to discuss EPA's BACT determination. (August 31, 1978 and January 19, 1979).

On May 31, 1979, EPA issued a Preliminary Determination that the source could be approved with conditions. The Preliminary Determination was advertized in the "Belle Glade Herald" on June 20, 1979, and made available for inspection at the Belle Glade Courthouse. The only comments received were from the applicant, and are attached.

In response to the applicant's comments, the Conditions of Approval have been changed as follows:

1) The amounts of bagasse and oil allowed to be burned have been changed to allow for more bagasse, while still keeping the total SO_2 emissions below 250 tons per year.
2) The limit on hours of operation has been changed to a reporting requirement, because the limit on fuel usage is sufficient to limit the SO_2 emissions.

3) The limitation on the particulate emissions from existing boilers has been deleted in response to additional modelling results showing the ambient air standards can be protected when the boilers are operating at the allowable limit under State regulations.

III. Review Requirements

The pollutant for which potential emissions are greater than 250 tons per year, and therefore subject to review, is particulate matter. Review of control technology and ambient impacts is required. For sources applying after August 7, 1978, ambient monitoring is required.

Certain portions of the PSD review may not be required if (1) the proposed modification is subject to EPA's Interpretative Ruling, or if (2) the source is a nonprofit health or education institution, or if (3) the source has previously received approval under PSD and is only relocating. None of these exemptions applies in this case.

Other exemptions can apply to control technology review and ambient impact review. For control technology review, if (4) allowable emissions of any pollutant are less than 50 tons per year, 1000 pounds per day and 100 pounds per hour, or if (5) a modification is made to an existing facility and the emissions are offset by reductions elsewhere, review may not be required. None of these exemptions applies to the proposed bagasse boiler #5.

For ambient impact review and monitoring requirements, other exemptions are provided for. In addition to the allowable emission threshold, there are exemptions for (6) temporary sources and for (7) sources whose net emissions, after considering decreases, do not increase. None of these exemptions apply to the proposed bagasse boiler #5.

The one exemption which does apply is for (8) monitoring. Since a complete application was submitted before August 7, 1978, no preconstruction monitoring is required.

A. Control Technology Review

1. Particulates

The applicant is required to install best available control technology (BACT) for particulates, taking into account energy, environmental and economic impacts and other costs. EPA concludes that the system proposed by the applicant represents BACT for particulates.

The applicant will install a wet impingement scrubber system to control particulate emissions. EPA gathered data from U.S. Sugar Corporation and Zurn Industries for the purpose of setting a BACT emission limit. This information shows that an emission limit of 0.15 pounds of particulate matter per million BTU heat input from bagasse is achievable.

Based on particulate emissions tests at existing boilers at the Bryant Mill using impingement scrubbers to control particulates, particulate emissions ranged from 0.035 to 0.246 pounds of particulate matter per million BTU heat input from bagasse. The existing boilers can easily meet the Florida standard of 0.3 pounds of particulate matter per million BTU heat input from bagasse (not part of the Federally Approved State Implementation Plan). This limit should be considered as an upper limit in determining BACT for the new bagasse boiler #5.

Based on averaging tests results for existing boilers at the Bryant Mill, the arithmetic mean is 0.118 pounds of particulate matter per million BTU. To set a BACT emission limit using this test data, it is appropriate to set an emission limit slightly higher than 0.118 pounds of particulate matter per million BTU since it is only expected to be achieved 50 percent of the time. Using the Florida Department of Environmental Regulation's plot of particulate emissions the following results were obtained:

Candidate Emission Limit	Percent of Time in Compliance
.118 average	50
.130	66-68
.150	84-87
.200	>98

At the Talisman Sugar Plant (Boiler #6) in Belle Glade, Florida, a venturi scrubber is used to control particulate emissions from a bagasse boiler. The following test results were obtained:

Test Date	Particulate Emissions (Pounds/million BTU)
1/76 3(runs)	0.156
1/78 3(runs)	0.106
Average	0.131

Zurn Industries, the manufacturer of the scrubber for the proposed bagasse boiler #5, informed EPA in a letter (October 4, 1978) that in their opinion, the state of the art for applying air pollution control equipment to bagasse firing is the venturi scrubber. This type scrubber is capable of allowing no more than 0.1 pound of particulate matter per million BTU heat input from bagasse at a venturi pressure drop of ten inches water gauge.

An article in the July, 1978 issue of the Journal of the Air Pollution Control Association stated that the particulate emissions from the St. James Sugar Cooperative Environeering scrubber in Louisiana averaged 0.112 pounds of particulate matter per million BTU. Bagasse is the primary fuel with natural gas utilized as an auxilliary fuel. Correcting for the portion of heat input provided by natural gas (18%) the test results from firing bagasse are 0.144 pounds of particulate matter per million BTU heat input from bagasse. A field inspection of the scrubber was conducted by EPA on September 14, 1978.

The Florida Department of Environmental Regulation concluded that BACT for control of particulates from bagasse boilers should be 0.15 pounds of particulate matter per million BTU heat input from bagasse, which includes a margin of safety.

Discussions with industry representatives and other EPA Regional Offices indicate that baghouses and electrostatic precipitators are not currently being used to control particulates from bagasse fired boilers. Problems with plugging, fire hazards and high costs were cited.

After consideration of the review performed by the Florida Department of Environmental Regulation and the EPA review of available data and guidelines, BACT has been determined to be 0.15 pounds of particulate matter per million BTU heat input from bagasse. When oil is burned, BACT has been determined to be 0.1 pounds of particulate matter per million BTU heat input from fossil fuel, which is the same limit required by the Rules of the Florida Department of Environmental Regulation (not federally approved as part of State Implementation Plan).

When bagasse and oil are fired simultaneously, the emission limit will be determined by the following equation: (0.15 pounds/million BTU x percent of bagasse burned (BTU basis) + 0.1 pounds/million BTU x percent oil burned (BTU basis)) ÷ 100.

2. Sulfur Dioxide

U.S. Sugar Corporation has proposed to limit their #6 oil usage to 400,000 gallons per year. The boiler is restricted by design (firing sub-system, including guns, piping, pump controls, and oil heater) to 150,000 pounds of steam per hour when burning #6 fuel oil. Thus, the use of #6 oil with a sulfur content of 0.7 percent and the bagasse boiler restricted to burning 226,500 tons of bagasse per year will result in sulfur dioxide emissions of less than 250 tons per year. Therefore, PSD is not applicable to the sulfur dioxide emissions.

3. Applicability of NSPS

As of this date, EPA has not proposed New Source Performance Standards for bagasse-fired boilers. At this time, there are New Source Performance Standards for fossil-fuel fired boilers which apply to facilities over 250 million BTU's per hour. However, the design of the bagasse boiler limits the steam production while burning oil to 150,000 pounds of steam per hour or 215 million BTU's per hour, which is below the applicability cutoff.

B. Impact Review

The PSD regulations require the following air quality impacts to be assessed by the applicant:

1) National Ambient Air Quality Standards (NAAQS)

2) PSD increments

3) Visibility, soils and vegetation

4) Impacts due to growth caused by proposed source

All these impacts were assessed by the applicant. Air quality modelling showed no violations of the NAAQS with all sources in the area of the Bryant Mill in operation. Likewise, the PSD increment analysis showed no violations with the #5 bagasse boiler operating at maximum load.

1) The maximum predicted concentrations with the proposed bagasse boiler #5 in operation are presented in the following table:

	Concentrations(Ug/m^3) Particulates	
	Annual* Average	24-Hour* Average
Maximum predicted concentration in vicinity of Bryant Mill	37	145
Federal Secondary Standards	—	150
Federal Primary Standards	75	260

*Includes 35 Ug/m^3 as background

2) The maximum consumption of the particulate Class II PSD increments caused by the proposed bagasse boiler #5 is presented in the following table:

Increment	Consumption
Annual	1.6%
24 Hour	38%

The closest Class I area is the Everglades National Park over 120 KM from Bryant. There will be no impact from the proposed bagasse boiler #5 on this area.

3) & 4) Impacts on visibility, soils and vegetation and on air quality due to growth were judged to be minimal.

PS Form 3811, Jan. 1979

RETURN RECEIPT, REGISTERED, INSURED AND CERTIFIED MAIL

SENDER: Complete items 1, 2, and 3. Add your address in the "RETURN TO" space on reverse.

1. The following service is requested (check one.)
- [x] Show to whom and date delivered .... ¢
- [ ] Show to whom, date and address of delivery ... ¢
- [ ] RESTRICTED DELIVERY Show to whom and date delivered .... ¢
- [ ] RESTRICTED DELIVERY. Show to whom, date, and address of delivery. $

(CONSULT POSTMASTER FOR FEES)

2. ARTICLE ADDRESSED TO:
Mr. A.R. Mayo, V.P.
U.S. Sugar Corp.
P.O. Drawer 1207
Clewiston, Fl 3340

3. ARTICLE DESCRIPTION:

REGISTERED NO.	CERTIFIED NO.	INSURED NO.
	P 408 530 368	

(Always obtain signature of addressee or agent)

I have received the article described above.
SIGNATURE ☐ Addressee ☐ Authorized agent

4. DATE OF DELIVERY
3.5.84

POSTMARK

5. ADDRESS (Complete only if requested)

6. UNABLE TO DELIVER BECAUSE:

CLERK'S INITIALS

☆GPO : 1979-300-459

P 408 530 368

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED—
NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to: A.R. Mayo, VP	
Street and No.: US Sugar Corp	
P.O., State and ZIP Code: P.O. Drawer 1207	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date	

PS Form 3800, Feb. 1982

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

March 3, 1984

CERTIFIED MAIL - RECEIPT REQUESTED

Mr. A. R. Mayo, Vice President
United States Sugar Corporation
P. O. Drawer 1207
Clewiston, Florida 33440

Dear Mr. Mayo:

A preliminary review of your application for permit to construct bagasse boiler No. 4 has been made. Before this application can be processed, the Department will need the following information.

1. The applicability of NSPS is based on the maximum design capacity of the proposed boiler, not the operating rate. If the proposed boiler was designed to burn bagasse exclusively, 40 CFR 60.40, subpart D would not apply. However the proposed boiler is capable of burning greater than 250 million Btu per hour of a fossil fuel, therefore subpart D will apply. Please submit a new recommended BACT determination taking into account the requirements of subpart D.

2. Why does the mill need the additional steam capacity?

3. Will any new process equipment be added to the mill to use the steam produced by proposed boiler No. 4?

4. Will electricity be generated and sold by the mill and, if so, how much will be generated and sold?

5. Where is the proposed steam generating unit located at the present time as per the date of this letter? Has this unit ever been permitted? What date was it constructed? Has it ever operated? If so, what fuels were used in it and what type of control device was installed on it? If the emissions were measured, what were the results?

6. Some data in the application indicates that Bryant boiler No. 5 was over 63 percent efficient while burning bagasse. The application listed the proposed boiler efficiency as 80 percent on oil and 55 percent on bagasse. How accurate are

these estimates? What range of efficiencies are actually expected?

7. The application listed a rated and a higher maximum capacity for each existing boiler at the plant. What is the estimated maximum capacity of the proposed No. 4 boiler and does the Company plan on operating the boiler at a higher capacity than 545.5 million Btu/hr heat input? How will the heat input to the proposed boiler be limited to 545.5 million Btu/hr?

8. Is it possible for the proposed boiler to burn more than 250 million Btu per hour of fossil fuel? If so, what will prevent the heat input from fossil fuel from exceeding this value?

9. During 1981-82, the Clewiston mill averaged 375,000 gallons of oil usage (Page 1-6). Is the 48,303 gallons of oil used by the pellet mills (page 1-2) included in this amount? Why did the heat required for the pellet mills vary from an average of 130-180 GPH between 1979 and 1982?

10. What was the average delivered cost of No. 6 oil containing 2.5 percent sulfur for 1979, 1980, 1981, 1982 and 1983? Please use plant records to obtain this average cost.

11. What is the current delivered cost of No. 6 fuel oil containing 2.5, 2.0, 1.5 and 1.0 percent sulfur delivered to the plant?

12. What is the type, model number, manufacturer and date of purchase of each oil meter used to record oil consumption in boiler numbers 1, 2, and 3? What was the date of the last calibration check for each meter? Do all the meters presently function as designed? What records in oil consumption for each boiler are kept by the plant? How often are the meter readings recorded in the log?

13. Is there a by-pass line installed around any of the fuel oil meters or any other means of by-passing the meter during operation of the boiler? If so, please furnish a sketch showing the storage tank, boilers, meters and oil piping.

14. The 1974 guarantee for the design of the Joy scrubber implies it should perform better than is being proposed in

the application. Was the scrubber design modified? What is the estimated efficiency by the design engineer of the proposed scrubber? Please submit a copy of the design engineer's guarantee that the emission from the proposed scrubber will meet the applicant's proposed BACT standard (0.2 lb/10^6 Btu) when the boiler is firing the anticipated maximum amount of wet bagasse (150,000 lb/hr).

15. The data from Bryant No. 5 boiler indicates that a scrubber efficiency of 91 percent would be required to meet the particulate emission limit of 0.2 lbs per million Btu heat input. If the particulate limit were to be 0.15, the scrubber efficiency required would be 93 percent. A standard of 0.10 will require even a higher efficiency. Will the proposed scrubber meet this requirement? If not, what modifications (higher pressure drop, etc.) or alternate controls (venturi scrubber, etc.) would be necessary? What would be the cost of this modification? Please submit supporting data.

16. How will the proposed scrubber be monitored to assure the pressure drop is maintained at the required differential and the volumetric flow of scrubber water is within specifications? Will the proposed scrubber be equipped with an automatic liquid level system as recommended by the designer?

17. Will the scrubber water be recirculated? If so, how will the scrubber water be monitored to assure the pH remains in the range of 7 to 8 (Page 3-11), which is the basis for the SO_2 emissions calculated on Page G-2?

18. Please address the feasibility of adding an alkaline solution to the scrubber water to increase SO_2 absorption.

19. Department field personnel have reported problems with plugging in the Joy impingment scrubber. What modifications are being made to this scrubber to minimize the plugging and any other problems that have been observed with the Joy design scrubber? How will the new scrubber be different from the existing scrubbers at the plant? Include dimensions of the proposed and existing scrubbers at the plant. Will the proposed scrubber contain adjustable weirs, gas-lock release mechanism and centrifugal type spray eliminators identical to the Joy design?

20. Can the boilers be operated without the scrubbers being in service? Has any boiler been operated without the scrubber

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee		
To:	Loctn.:	
To:	Loctn.:	
To:	Loctn.:	
From:	Date:	
Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due:	Date Due:	

TO: Clair Fancy

THROUGH: Bill Thomas
David Knowles DK

FROM: Mirza Baig MB

DATE: February 3, 1983

SUBJECT: U.S. Sugar Corp., Clewiston - Boiler #6

DER
FEB 06 1984
BAQM

We have reviewed the construction permit application for the above referenced project and following are our comments:

1. Latitude and longitude coordinates appear to be incorrect.

2. Since this plant is located in populated area, the use of 2.5% sulfur oil is not appropriate.

3. Page 4-3; TSP standard violated at Section 19.

4. Page 4-4, paragraph 4-3. SO_2 data from Belle Glade is needed.

5. Page 4-5, paragraph 4.4 Ozone data from Belle Glade is needed.

6. Page C-19, dimension from last flow disturbance to stack test ports not given (Distance A and Distance B).

7. Page 1-7, a fan curve for the exhaust I.D. fan is needed.

8. Stack height, According to the application, the stack height is 100 feet. The location of the boiler is such that an opacity observation is not possible at this stack height during certain hours of the day. We recommend that the stack height be a minimum of 175 feet or twice the height of the nearest building/structure. The stack height for the new boiler #8 at Sugar Cane Growers Cooperative is 155 feet.

9. We recommend that a one-time boiler efficiency test be required at maximum steam capacity fired with at least 1400 gal/hour of fuel oil.

10. Page 2-17, paragraph 2.3.3. The applicant is seeking exemption from ambient monitoring requirements. We strongly recommend that TSP and SO_2 monitoring be required at suitable locations, for at least two seasons after this new boiler has been placed in operation. Florida Sugar Cane League currently operates and maintains a PSD-approved ambient monitoring network in Florida Sugar industry.

11. It has been our experience that all new boiler scrubbers when operated properly meet the 0.150 lb/10^6 BTU particulate requirement. If the Sugar industry has trouble meeting this standard, we suggest a 0.1750 #/10^6 BTU heat input limitation instead of 0.020 #/10^6 BTU.

?

0.2

/db

being in service? If so, what was the cause of the scrubber outage, how long was it down, and how often does this occur?

21. How will the stack test personnel get to the sampling platform on the stack? The drawing does not show a "caged" ladder or other form of access to the platform. Also, what are the dimensions from the last flow disturbance and top of the stack to the test ports for the 150 foot stack?

22. What will control fugitive emissions from the bagasse during dry periods? Please quantify these emissions and any other fugitive emissions and estimate their ambient impacts.

23. Is the correct latitude/longitude for the proposed boiler 26° 44' 30" N/ 80° 56' 15" W?

24. What is the distance and direction to the nearest public access to the plant? What will prevent the public from getting nearer to the plant?

25. How does the ambient air quality concentrations for ozone and sulfur dioxide assumed in the application compare to the data collected by the Florida Sugar Cane League? Please send a copy of this ambient air quality data.

26. Please furnish a copy of the fan curve for an American Standard model 537 DI 2/3 DW, Series 2014 fan or explain why one is not available.

27. Please provide us with the locations of cane fields in which sugar cane burning occurred on the three days when FSCL TSP Monitor #19 recorded its highest values.

28. As stated in the PSD report, SO_2 and VOC (ozone) require an ambient monitoring analysis under PSD regulations. Please provide us with at least one year of SO_2 and ozone monitoring data from the FSCL monitors located in Belle Glade. Please provide us with all quality assurance requrements as per 40 CFR 58, Appendix B for the ozone monitor.

29. Since the height of the proposed stack for boiler #4 is less than the "good engineering practice" GEP stack height of 225 feet based upon the Boiling house dimensions, please provide a downwash anlaysis for TSP and SO_2 emissions.

As soon as we receive answers to the above questions, we will resume processing your application. If you have any questions about our letter, please call Cleve Holladay (modeler) or Willard Hanks (review engineer) at 904-488-1344.

Sincerely,

E. J. Palagyi
for C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality
Management

CHF/WH/s
cc: David Knowles, SW District
David Buff, ESE

UNITED STATES SUGAR CORPORATION
P. O. Drawer 1207
CLEWISTON, FLORIDA 33440

January 9, 1984

Original Applic. for Boiler No. 4 Revised 2/1/84

Mr. David Knowles, Engineer
Department of Environmental Regulation
2269 Bay Street
Fort Myers, Fl. 33901

RE: Hendry County - AP
USSC Clewiston

Dear Mr. Knowles:

Enclosed please find Construction Permit Application in quadruplicate for a proposed additional bagasse boiler for our Clewiston sugar mill - Bagasse Boiler No. 4, that has been prepared by Environmental Science and Engineering, Inc., together with our check for $1,000.00 covering the application fee. It is our understanding that this application is complete with the exception of the air dispersion model result computer print-out that Environmental Science and Engineering will be forwarding to you directly.

We will appreciate your expeditious handling of this application since we need to have this boiler completed by the beginning of the 1984-85 season in early November 1984.

Sincerely,

UNITED STATES SUGAR CORPORATION

A. R. Mayo

A. R. Mayo
Vice President, Sugar Houses

ARM:jt
Enclosures
cc: Mr. David Buff, ESE
Mr. William H. Green

RECEIVED
JAN 10 1984
DISTRICT

AC 26-80930

RECEIVED
JAN 10 1984
DER SO FLA. DISTRICT

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

ST. JOHNS RIVER DISTRICT

3319 MAGUIRE BOULEVARD
SUITE 232
ORLANDO, FLORIDA 32803

Paid 1-10-84 $1000

1205

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

ALEX SENKEVICH
DISTRICT MANAGER

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Bagassé/Oil-Fired Boiler [XX] New[1] [ ] Existing[1]

APPLICATION TYPE: [XX] Construction [ ] Operation [ ] Modification

COMPANY NAME: U.S. Sugar Corporation, Clewiston Mill COUNTY: Hendry

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Boiler 4

SOURCE LOCATION: Street W.C. Owens Avenue and Clewiston Street City Clewiston

UTM: East 506.1 North 2956.9

Latitude 26 ° 44 ' 30 "N Longitude 81 ° 56 ' 15 "W

APPLICANT NAME AND TITLE: A.R. Mayo, Vice President

APPLICANT ADDRESS: P.O. Drawer 1207, Clewiston, Florida 33440

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of U.S. Sugar Corporation

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: A. R. Mayo

A.R. Mayo, Vice President
Name and Title (Please Type)

Date: Jan. 9, 1984 Telephone No. 813-983-8121

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

DAVID A. BUFF CERTIFICATE NO. 19011 STATE OF FLORIDA REGISTERED ENGINEER

Signed David A. Buff

David A. Buff
Name (Please Type)

Environmental Science and Engineering, Inc.
Company Name (Please Type)

P.O. Box ESE, Gainesville, Florida 32602
Mailing Address (Please Type)

Florida Registration No. 19011 Date: Feb. 1, 1984 Telephone No. 904/332-3318

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See PSD Report

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction March 1984 Completion of Construction January 1985

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Spray Impingement Scrubber: $200,000

Stack: $25,000

Fan: $15,00

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

See PSD Report for permits for existing boilers

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 26 ;

if power plant, hrs/yr _____ ; if seasonal, describe: Normally from November thru March; maximum season would be October 15 thru April 15 (182 days/yr)

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? _____

   b. If yes, has "Lowest Achievable Emission Rate" been applied? _____

   c. If yes, list non-attainment pollutants. _____

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? _____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

See PSD Report for Source Applicability

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Not Applicable

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 545.5×10^6 Btu/hr on bagasse or bagasse/oil
   225.0×10^6 Btu/hr maximum from oil

2. Product Weight (lbs/hr): 250,000 lb/hr Steam

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Particulates	109.1	238	0.2 lb/10^6Btu	109.1	1212	2647	C
Sulfur Dioxide	642.9	382	-	-	697.4	667	C
Nitrogen Oxides	136.8	206	-	-	136.8	206	C
Carbon Monoxide	136.4	298	-	-	136.4	298	C
Vol. Org. Comps.	128.8	281	-	-	128.8	281	C

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Spray Impingement Scrubber Joy Turbulaire	Particulate	90+%	See PSD Report	See PSD Report
Type D, Size 150 or	SO_2 from bagasse	50%	N/A	"
equivalent				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Bagasse		68,182 lb/hr dry 151,528 lb/hr wet	545.5
No. 6 Fuel Oil		1,499 gal/hr	225.0

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: See PSD Report

Percent Sulfur: ______ Percent Ash: ______

Density: ______ lbs/gal Typical Percent Nitrogen: ______

Heat Capacity: ______ BTU/lb ______ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average Not Applicable Maximum Not Applicable

G. Indicate liquid or solid wastes generated and method of disposal.

Water from Scrubbers used to sluice cane juice mud. Scrubber water discharges to holding ponds.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 150 ft. Stack Diameter: 7.25 ft.

Gas Flow Rate: See PSD Report ACFM ____ DSCFM Gas Exit Temperature: 153 °F.

Water Vapor Content: 30 % Velocity: See PSD Report FPS

SECTION IV: INCINERATOR INFORMATION

Not Applicable

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patholog-ical)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (lbs/hr)							

Description of Waste ____

Total Weight Incinerated (lbs/hr) ____ Design Capacity (lbs/hr) ____

Approximate Number of Hours of Operation per day ____ day/wk ____ wks/yr. ____

Manufacturer ____

Date Constructed ____ Model No. ____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ____ ft. Stack Diamter: ____ Stack Temp. ____

Gas Flow Rate: ____ ACFM ____ DSCFM* Velocity: ____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ____

Brief description of operating characteristics of control devices: ______________________

____

____

____

____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

____

____

____

____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

See PSD Report

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [XX] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[XX] Yes [ ] No

Contaminant	Rate or Concentration
Particulate	0.15 $lb/10^6$ Btu (bagasse): 0.1 $lb/10^6$ Btu (oil
SO_2	1.0% Sulfur oil
Other pollutants	Uncontrolled emission rate

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
Particulate - bagasse: oil	0.2 $lb/10^6$ Btu: 0.1 $lb/10^6$ Btu
Sulfur Dioxide - Bagasse: oil	0.25 $lb/10^6$ Btu: 2.5% S oil and 500,000 gal/y
Other pollutants	Maximum emission rate shown in Section III.C

D. Describe the existing control and treatment technology (if any). See PSD Report

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary). See PSD Report

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected: See PSD Report

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data

1. FSCL no. sites 2 TSP ( ) SO^2* Wind spd/dir

Period of Monitoring 10 / 1 / 82 to 12 / 8 / 83
month day year month day year

Other data recorded

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [XX] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[XX] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. 5 Year(s) of data from 1 / 1 / 70 (month day year) to 12 / 31 / 74 (month day year)

2. Surface data obtained from (location) West Palm Beach Airport

3. Upper air (mixing height) data obtained from (location) Miami

4. Stability wind rose (STAR) data obtained from (location) West Palm Beach Airport

C. Computer Models Used

1. Industrial Source Complex Modified? If yes, attach description.

2. ______ Modified? If yes, attach description.

3. ______ Modified? If yes, attach description.

4. ______ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	See PSD Report	grams/sec
SO^2	See PSD Report	grams/sec

E. Emission Data Used in Modeling See PSD Report

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review. See PSD Report

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources. See PSD Report

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology. See attached supportive information

PREVENTION OF SIGNIFICANT DETERIORATION REPORT

U.S. SUGAR CORPORATION
CLEWISTON MILL
BOILER NUMBER 4

Prepared By:

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

January 1984

ESE No. 83-172-0100

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1.0 PROJECT DESCRIPTION

1.1 EXISTING MILL OPERATIONS

U.S. Sugar Corporation currently owns and operates a sugar cane processing mill in Clewiston, Hendry County, Florida (Figures 1-1 and 1-2). The mill is fairly isolated from other significant air pollution sources, the nearest such sources being the Gulf & Western Foods sugar mill, located 17 kilometers (km) southeast, and the Sugar Cane Growers Cooperative, Inc. sugar mill, located 29 km to the east. The plant is located near the southwestern edge of Lake Okeechobee in a rural setting and is almost totally surrounded by sugar cane fields.

A flow diagram of the operations at the Clewiston mill is shown in Figure 1-3. Sugar cane from the surrounding fields is harvested and brought to the mill where the cane is crushed, and the juice is extracted. Steam generated in the mill boilers is used to power the grinding mills. The juice is concentrated and separated into sugar crystals and molasses. Bagasse is cane from which the juice has been extracted and is a waste product of the extraction process. Process steam for the mill is provided by burning bagasse in five boilers (Nos. 1, 2, 3, 5, and 6). A small amount of oil is sometimes burned in Boilers 1, 2, and 3 to supplement steam production and to stabilize boiler operation. Boilers 5 and 6 are equipped to burn bagasse only. The total plant steam generating capacity is currently 720,775 pounds per hour (lb/hr) when all boilers are operating at maximum capacity (total rated capacity is 490,000 lb/hr).

Bagasse is fed to the existing boilers by conveyors and feeders. The inherent moisture content of the incoming bagasse, normally 55 percent, effectively minimizes potential fugitive particulate matter (PM) emissions from bagasse handling. Fuel oil is supplied to each boiler by means of a piping and metering system. A single fuel oil storage tank of 400,000-gallon capacity feeds all of the existing boilers. Individual boiler supply lines are routed from the main supply line, and each individual boiler line is fitted with a metering device to measure

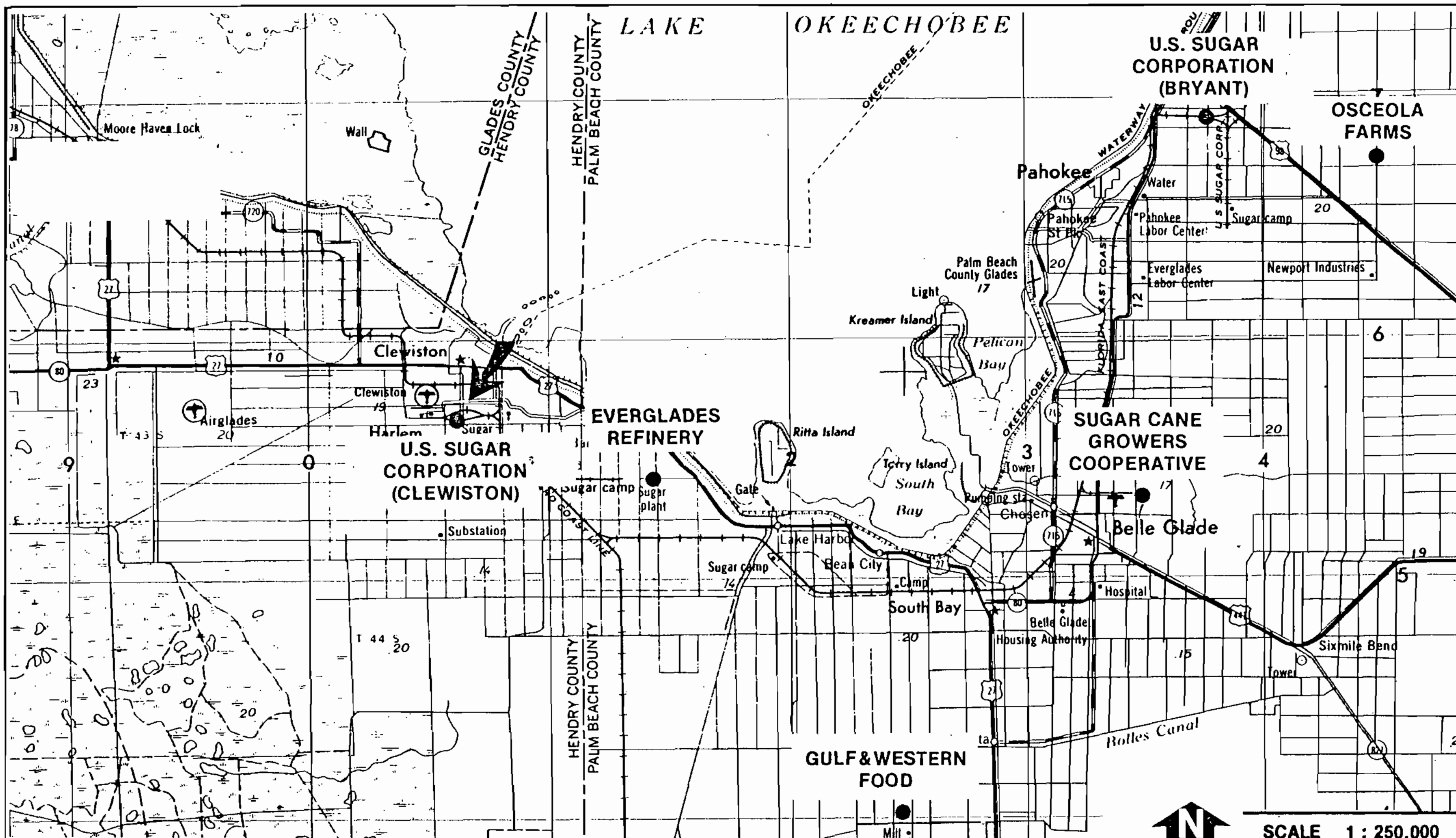

Figure 1-1
LOCATION OF U.S. SUGAR CORPORATION
WITH RESPECT TO SURROUNDING AREA

SOURCE: ESE, 1983.

U.S. SUGAR CORPORATION
Clewiston, Florida

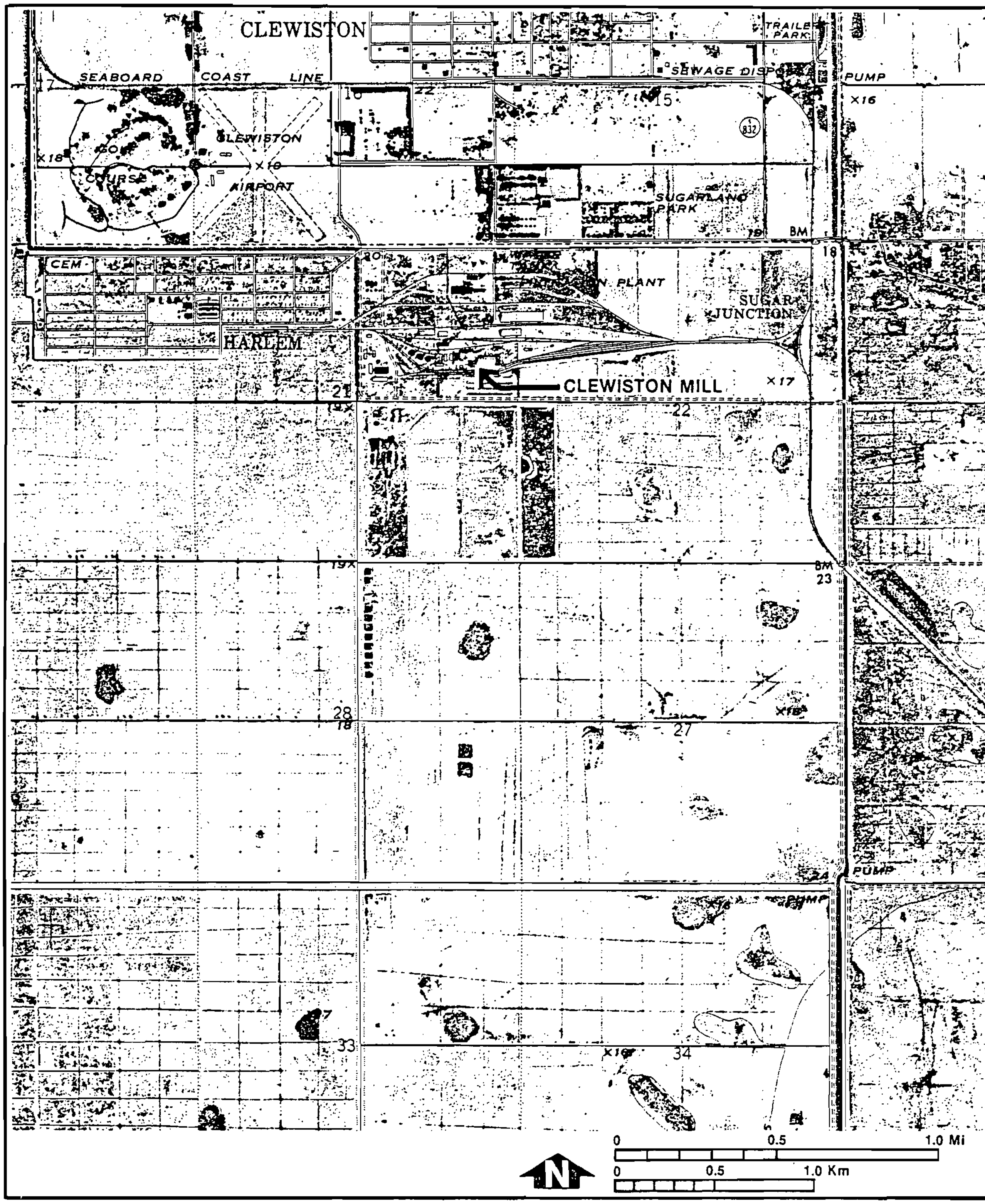

Figure 1-2
VICINITY MAP OF U.S. SUGAR CORPORATION'S CLEWISTON MILL

SOURCE: USGS, 1970.

U.S. SUGAR CORPORATION
Clewiston, Florida

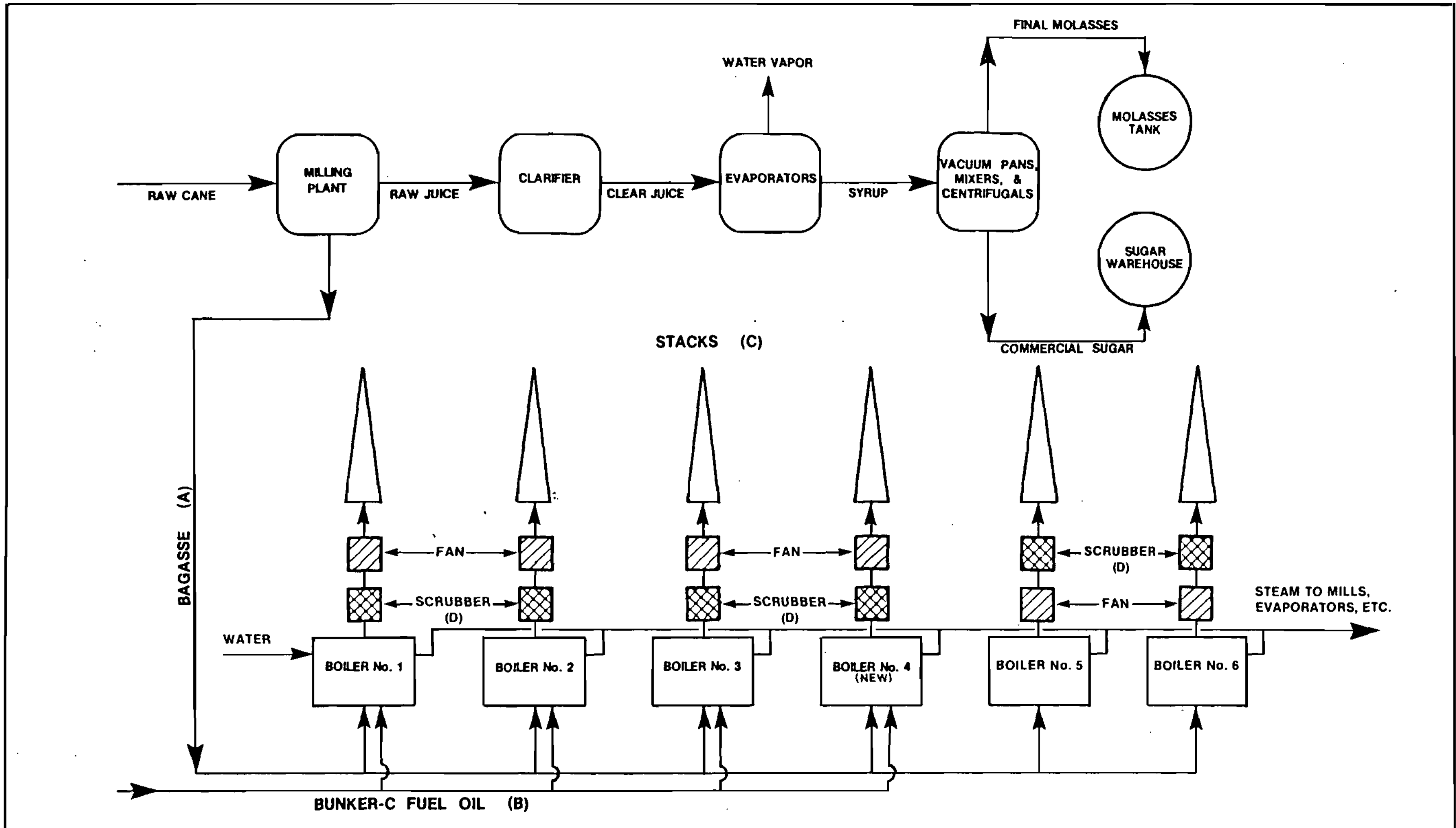

Figure 1-3
SCHEMATIC PROCESS FLOW DIAGRAM

SOURCE: ESE, 1983.

U.S. SUGAR CORPORATION
Clewiston, Florida

the amount of oil fed to the boiler. No additives are used in the oil; oil is burned as received from Belcher Oil Company.

The amount of bagasse fed to each boiler is not directly measured. However, steam temperature and pressure, boiler feedwater temperature and pressure, and steam flow rate are measured. Bagasse consumption is determined through the following procedure:

1. The enthalpy of the steam and the boiler feedwater is calculated from the temperature and pressure measurements.
2. Total heat input to the steam is calculated from the enthalpy difference and the steam flow.
3. Heat input to the boiler due to oil firing is calculated from the oil consumption data and the fuel heating value, this latter parameter provided by the oil supplier (see Appendix A for representative fuel analysis). An 80-percent boiler efficiency is assumed when firing oil and is used to determine the heat input to the steam.
4. The remaining required heat input to the steam due to bagasse firing is then calculated as the difference between total heat input to the steam (Item 2 above) and the heat input due to oil firing (Item 3 above).
5. Heat input to the boiler from bagasse firing is then determined based on 55-percent efficiency, and the amount of bagasse required is calculated based upon an average of 8,000 British thermal units per pound (Btu/lb) of bagasse (dry basis) (see Appendix A for fuel analysis).

All the boilers at the Clewiston mill are equipped with spray impingement scrubbers to control PM emissions. Exhaust gases from each boiler pass through a scrubber, a fan, and finally the exhaust stack, as shown in Figure 1-3. All the existing boilers at the mill must meet a PM emission limit of 0.3 lb/10^6 Btu when burning bagasse and 0.1 lb/10^6 Btu when burning oil.

The sugar cane industry is seasonal: the Clewiston mill typically operates 150 days per year, from November through March. To be conservative, all analyses presented in this report are based on a 182-day crop year (October 15 through April 15).

1.2 PROPOSED MODIFICATION

To meet anticipated steam demands at the Clewiston mill, U.S. Sugar Corporation must install a new bagasse/oil-fired boiler of 250,000 lb/hr steam capacity. The new boiler (Boiler 4) must be operational by the 1984-1985 crop year (i.e., by November 1984); therefore, construction of the new boiler will commence as soon as a construction permit is obtained. The boiler, initially designed to burn coal or gas, was manufactured by Foster Wheeler Corporation and is capable of generating the rated amount of steam by burning bagasse only. The boiler will be of the traveling gate type. Steam production due to fuel oil firing will be limited to 150,00 lb/hr, or a heat input of 225.0 million Btu per hour (10^6 Btu/hr). Specifications for the new boiler are presented in Appendix B.

Since all existing boilers at the Clewiston mill currently use No. 6 fuel oil of about 2.4-percent sulfur and the mill has a single fuel oil storage tank and supply system, it is proposed to use this same oil (maximum of 2.5-percent sulfur) in the new boiler. Since fuel oil is expensive compared to bagasse (a waste product), every attempt is made to minimize fuel oil usage in boilers at the mill. U.S. Sugar Corporation will limit total fuel oil consumption in the new boiler to 500,000 gallons per year. Actual usage is expected to be far below this level. The entire Clewiston mill averaged 375,000 gallons of fuel oil consumption per year in 1981 and 1982.

The proposed Boiler 4 will be equipped with a spray impingement scrubber similar to the other scrubbers at the Clewiston mill. The scrubber will be capable of controlling PM emissions to a level of 0.2 lb/10^6 Btu heat input from bagasse firing and 0.1 lb/10^6 Btu heat input from oil firing. These levels represent the State of Florida emission

standards for carbonaceous fuel burning equipment (i.e., bagasse boilers). U.S. Sugar Corporation considers the spray impingement scrubber to be the Best Available Control Technology (BACT) for bagasse boilers considering their proven ability in the Florida sugar cane industry, economics, energy considerations, and environmental impacts.

The spray impingement scrubber will be manufactured by U.S. Sugar Corporation. The design will be equivalent to a Western Precipitation (Joy) Turbulaire scrubber, Type D, Size 150, and will operate at a pressure drop of approximately 5.5 inches of water (in. H_2O) and at a water usage rate of 200 to 300 gallons per minute (gpm). Details of the scrubber design, Joy manufacturing literature, and Joy's performance guarantee for this scrubber design are presented in Appendix C.

The exhaust fan, also to be manufactured by U.S. Sugar Corporation, will be of American Standard design, equivalent to Model 537 DI 2/3 DW, Series 2014. The fan will operate at approximately 1,000 revolutions per minute (rpm) and 800 to 1,000 horsepower at a static pressure of about 18 in. H_2O. The fan will be electrically driven. A fan curve in not available.

In addition to the fuel oil usage limitations placed on the new boiler, limitations will also be placed on operation of the existing boilers. These limitations will ensure that all ambient air quality standards are not exceeded in the vicinity of the Clewiston mill due to mill operation. The limitations, itemized below, are discussed in more detail in the remainder of this section.

1. Total mill fuel oil consumption will be limited to 6,300 gallons for a 3-hour period (average of 2,100 gallons per hour) and 40,800 gallons for a 24-hour period (average of 1,700 gallons per hour).
2. Allowable PM emissions for Boilers 1 and 2 will be reduced to 0.25 $lb/10^6$ Btu when burning bagasse.

Capacities and fixed stack parameters for both the existing boilers (Nos. 1, 2, 3, 5, and 6) and the proposed boiler (No. 4) at the Clewiston mill are shown in Table 1-1. Capacities are shown in terms of pounds of steam produced per hour (lb stm/hr) and heat input to the boilers (10^6 Btu/hr). "Rated capacity" represents the actual nameplate rating of the boiler. "Maximum capacity" represents the highest capacity attained during any particulate compliance test of the boiler (see Appendix D for compilation of data). As shown, Boilers 1, 2, and 3 have achieved steam production rates significantly in excess of their rated capacities. The air quality analysis presented in Section 5.0 was based on the boilers operating at their maximum capacities.

The fixed stack parameters presented in Table 1-1 do not vary according to boiler operation. Stack height and diameter, of course, are fixed according to design of the stack. The stack temperature does not vary appreciably for any of the boilers, even when fuel oil is fired, as demonstrated by the source test data presented in Appendix D. Stack temperatures shown in Table 1-1 are based on the average temperature measured during source tests on each boiler during the last 3 crop years. The exhaust gas flow rate and velocity can vary depending on the combination of fuels being fired in the boilers.

Ambient air quality standards for PM exist for the annual and 24-hour averaging times. As a result, it is necessary to determine worst-case 24-hour operating conditions for PM for the Clewiston mill. The current PM emission limits for the existing boilers are 0.3 lb/10^6 Btu when firing bagasse and 0.1 lb/10^6 Btu when firing oil. Similarly, the proposed boiler must meet a PM emission limit of 0.2 lb/10^6 Btu for bagasse and 0.1 lb/10^6 Btu for oil. After the proposed Boiler 4 begins operation, Boilers 1 and 2 will emit no more than 0.25 lb/10^6 Btu of PM when burning bagasse. The worst-case operating condition for PM emissions is the firing of 100-percent bagasse in all of the boilers.

Table 1-1. Capacities and Fixed Stack Parameters for Existing and Proposed Boilers at U.S. Sugar Corporation's Clewiston Mill

Boiler No.	Rated Capacity		Maximum Capacity		Stack Height (m)	Stack Diameter (m)	Stack Temperature (°K)
	lb stm/hr	10^6 Btu/hr*	lb stm/hr	10^6 Btu/hr*			
Existing							
1	150,000	286.0	236,250	462.3	22.86	1.86	344
2	150,000	286.0	214,817	453.2	22.86	1.86	343
3	100,000	191.0	128,483	275.0	27.43	2.29	342
5	70,000	134.0	70,667	136.0	19.81	1.83	338
6	70,000	134.0	70,588	138.1	19.81	1.83	340
Proposed							
4	250,000	545.5	--	--	45.72	2.21	340

* When firing bagasse only.

Source: U.S. Sugar Corporation, 1983.

Table 1-2 summarizes Clewiston mill operating conditions for the case of total bagasse firing.

Three-hour and 24-hour ambient air quality standards for sulfur dioxide (SO_2) require that worst-case short-term operating conditions be identified for the mill. To ensure that the standards are met, U.S. Sugar will limit total No. 6 fuel oil consumption in the mill to 6,300 gallons for a 3-hour period (average of 2,100 gal/hr) and 40,800 gallons per day (gpd) (average of 1,700 gal/hr). Shown in Table 1-3 are the boiler and fuel usage parameters and SO_2 emissions associated with the 3-hour worst-case scenario. Data for the 24-hour worst-case scenario are presented in Table 1-4.

All of the existing boilers have similar stack heights (65 to 75 feet). The proposed Boiler 4 will have a greater stack height (150 feet); therefore, worst air quality impacts will occur when fuel oil is burned in the boilers with the shorter stacks (i.e., Boilers 1, 2, and 3: Boilers 5 and 6 burn bagasse only). The remainder of maximum steam capacity for each of the boilers is generated by burning bagasse.

The SO_2 emission rates shown in Tables 1-3 and 1-4 reflect a 50-percent reduction in the theoretical amount of SO_2 resulting from burning bagasse. No reduction in theoretical SO_2 is assumed for fuel oil burning. The 50-percent reduction for bagasse is assumed to be conservative for bagasse burning in boilers equipped with spray impingement type scrubbers, as substantiated by the analysis presented in Appendix E. The resulting worst-case 3-hour and 24-hour SO_2 emissions are 1,250.2 lb/hr and 1,108.0 lb/hr, respectively, total for all boilers.

Burning fuel oil in the boilers alters the boiler exhaust flow rate, which may, in turn, affect the plume rise of the exhaust gases and ground-level air quality impacts. To accurately simulate this situation, a theoretical combustion calculation for typical No. 6 fuel

Table 1-2. Clewiston Mill Emissions and Stack Parameters Used in PM Impact Analysis

Boiler	Fuel	Maximum Capacity (10^6 Btu/hr)	Particulate Emissions lb/10^6 Btu	Particulate Emissions lb/hr	Exhaust Flow Rate* (acfm)	Exhaust Gas Velocity (m/s)
1	Bagasse	462.3	0.25	115.6	147,022	25.5
2	Bagasse	453.2	0.25	113.3	149,671	25.9
3	Bagasse	275.0	0.3	82.5	101,931	11.7
5	Bagasse	136.0	0.3	40.8	63,620	11.4
6	Bagasse	138.1	0.3	41.4	61,294	11.0
4 (Proposed)	Bagasse	545.5	0.2	109.1	205,180	25.2

Abbreviations: acfm = actual cubic feet per minute.
m/s = meters per second.

* Flow rate associated with source test during which maximum capacity of boiler was reached. For the proposed Boiler 4, source test data from U.S. Sugar Bryant Mill Boiler 5 was used (see Appendix D), since this boiler is essentially identical to the proposed boiler. Maximum capacity test was again used, but since this test was below rated capacity, exhaust flow rate was ratioed upwards to obtain flow for rated capacity of 250,000 lb stm/hr.

Source: ESE, 1983.

Table 1-3. Clewiston Mill Worst-Case 3-Hour SO_2 Emissions

Boiler	Maximum Capacity (lb stm/hr)	Fuel Oil gal/hr	Fuel Oil 10^6 Btu/hr	Fuel Oil lb stm/hr	Bagasse lb stm/hr	Bagasse 10^6 Btu/hr	Bagasse lb/hr (dry)	SO_2 Emissions (lb/hr)† Oil	SO_2 Emissions (lb/hr)† Bagasse	SO_2 Emissions (lb/hr)† Total
1	236,250	815	122.3	91,014	145,236	283.9	35,488	334.2	71.0	405.2
2	214,817	800	120.0	81,702	133,115	284.4	35,550	328.0	71.1	399.1
3	128,483	485	72.8	49,566	78,917	168.6	21,074	198.9	42.1	241.0
5	70,667	0	0	0	70,667	136.0	17,000	0	34.0	34.0
6	70,558	0	0	0	70,558	138.1	17,263	0	34.5	34.5
4(Proposed)	250,000	0	0	0	250,000	545.5	68,188	0	136.4	136.4
TOTAL	970,775	2,100*	315.1	222,282	748,493	1,556.5	194,563	861.1	389.1	1,250.2

* 6,300 gallons for a 3-hour period.
† Assumes 50-percent SO_2 removal efficiency in scrubber when burning bagasse; no removal when burning oil.

NOTES: No. 6 Fuel Oil - 2.5 percent sulfur
18,300 Btu/lb
8.2 lb/gal
80-percent boiler efficiency
Bagasse (dry) - 0.2 percent sulfur
8,000 Btu/lb
55-percent boiler efficiency
Steam - Boiler 1 - 1,075 Btu/lb
Boiler 2 - 1,175 Btu/lb
Boiler 3 - 1,175 Btu/lb
Boiler 5 - 1,058 Btu/lb
Boiler 6 - 1,076 Btu/lb
Boiler 4 (Proposed) - 1,200 Btu/lb

Source: ESE, 1983.

Table 1-4. Clewiston Mill Worst-Case 24-Hour SO_2 Emissions

Boiler	Maximum Capacity (lb stm/hr)	Fuel Oil gal/hr	Fuel Oil 10^6 Btu/hr	Fuel Oil lb stm/hr	Bagasse lb stm/hr	Bagasse 10^6 Btu/hr	Bagasse lb/hr (dry)	SO_2 Emissions (lb/hr)† Oil	SO_2 Emissions (lb/hr)† Bagasse	SO_2 Emissions (lb/hr)† Total
1	236,250	690	103.5	77,023	159,227	311.2	38,900	282.9	77.8	360.7
2	214,817	630	94.5	64,340	150,477	321.5	40,188	258.3	80.4	338.7
3	128,483	380	57.0	38,809	89,674	191.6	23,950	155.8	47.9	203.7
5	70,667	0	0	0	70,667	136.0	17,000	0	34.0	34.0
6	70,558	0	0	0	70,558	138.1	17,263	0	34.5	34.5
4(Proposed)	250,000	0	0	0	250,000	545.5	68,188	0	136.4	136.4
TOTAL	970,775	1,700*	255.0	180,172	790,603	1,643.9	205,489	697.0	411.0	1,108.0

* 40,800 gallons for a 24-hour period.
† Assumes 50-percent SO_2 removal efficiency in scrubber when burning bagasse; no removal when burning oil.

NOTES: No. 6 Fuel Oil - 2.5 percent sulfur
18,300 Btu/lb
8.2 lb/gal
80-percent boiler efficiency

Bagasse (dry) - 0.2 percent sulfur
8,000 Btu/lb
55-percent boiler efficiency

Steam - Boiler 1 - 1,075 Btu/lb
Boiler 2 - 1,175 Btu/lb
Boiler 3 - 1,175 Btu/lb
Boiler 5 - 1,058 Btu/lb
Boiler 6 - 1,076 Btu/lb
Boiler 4 (Proposed) - 1,200 Btu/lb

Source: ESE, 1983.

oil was performed, with the exhaust gases passed through the wet scrubber (see Appendix F).

In addition, the average acfm of exhaust gases produced per 10^6 Btu heat input from bagasse fuel was determined for Boilers 1, 2, and 3 from source test data (see Appendix F). Based on these calculations and the relative amounts of bagasse and oil burned in each boiler, an adjusted boiler exhaust flow rate was calculated for the worst-case 3-hour and 24-hour SO_2 emission scenarios (Table 1-5). The resulting flow rates are not affected greatly by the burning of fuel oil (see Table 1-2 for comparison).

Table 1-5. Exhaust Gas Parameters Associated with Worst-Case 3-Hour and 24-Hour SO_2 Emissions

Boiler	Fuel Oil Heat Input 10^6 Btu/hr	Fuel Oil lb oil/hr†	Fuel Oil acfm**	Bagasse Heat Input 10^6 Btu/hr	Bagasse acfm per 10^6 Btu/hr	Bagasse acfm	Total acfm	Exit Gas Velocity (m/s)
				3-HOUR CASE				
1	122.3	6,683	39,045	283.9	332.9	94,510	133,555	23.1
2	120.0	6,560	38,327	284.4	367.5	104,517	142,844	24.7
3	72.8	3,977	23,236	168.6	382.3	64,456	87,692	10.1
4 (New)*	0	0	0	545.5	--	205,180	205,180	25.2
5*	0	0	0	136.0	--	63,620	63,620	11.4
6*	0	0	0	138.1	--	61,294	61,294	11.0
				24-HOUR CASE				
1	103.5	5,658	33,057	311.2	332.9	103,598	136,655	23.6
2	94.5	5,166	30,182	321.5	367.5	118,151	148,333	25.6
3	57.0	3,116	18,205	191.6	382.3	73,249	91,454	10.5
4 (New)*	0	0	0	545.5	--	205,180	205,180	25.2
5*	0	0	0	136.0	--	63,620	63,620	11.4
6*	0	0	0	138.1	--	61,294	61,294	11.0

* Based upon values shown in Table 1-2 for bagasse burning.
† From Tables 1-3 and 1-4 with oil = 8.2 lb/gal.
** Based upon 350.55 acf/lb oil (see Appendix F).

Source: ESE, 1983.

2.0 AIR QUALITY REVIEW REQUIREMENTS AND SOURCE APPLICABILITY

The following discussions pertain to the regulatory requirements that must be met for the construction and operation of the proposed Boiler 4, as required by federal and state PSD regulations and other air quality regulations.

2.1 NATIONAL AND STATE AAQS

As a result of the requirements of the 1970 CAA Amendments, EPA enacted primary and secondary national AAQS (Federal Register, 1971) for six air pollutants. Primary national AAQS are required to protect the public health, and secondary national AAQS are required to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air.

Table 2-1 presents the existing applicable national and State of Florida AAQS. Since the original standards were issued in 1971, the following changes have been made to the national AAQS.

1. EPA eliminated the annual and 24-hour secondary AAQS for SO_2;
2. The AAQS for photochemical oxidants was redesignated as ozone, the concentration limit was increased, and the method for determining compliance was changed;
3. A new national AAQS for lead was promulgated; and
4. The hydrocarbon AAQS was rescinded.

Prior to these changes, the State of Florida promulgated the secondary national AAQS for SO_2 as the state AAQS. Since states have the authority to adopt AAQS more stringent than those established by EPA, the State of Florida has chosen to retain the secondary AAQS for SO_2 which were eliminated by EPA. Pollutants for which AAQS have been established are called "criteria" pollutants.

Areas of the country shown to be in violation of AAQS are designated as nonattainment areas, and new sources to be located in or near these

Table 2-1. Federal and State AAQS Applicable to the Proposed Project

Pollutant	Averaging Time	Federal Primary Standard	Federal Secondary Standard	State of Florida
Suspended Particulate Matter	Annual Geometric Mean	75	60	60
	24-Hour Maximum*	260	150	150
Sulfur Dioxide	Annual Arithmetic Mean	80	N/A	60
	24-Hour Maximum*	365	N/A	260
	3-Hour Maximum*	N/A	1,300	1,300
Carbon Monoxide	8-Hour Maximum*	10,000	10,000	10,000
	1-Hour Maximum*	40,000	40,000	40,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100
Ozone	1-Hour Maximum†	235	235	235
Lead	Calendar Quarter	1.5	1.5	1.5

* Maximum concentration not to be exceeded more than once per year.
† Maximum concentration not to be exceeded more than an average of 1 calendar day per year.

Sources: 40 CFR, Parts 50 and 52.
Ch 17-2, FAC.

areas may be subject to more stringent air permitting requirements. Areas of the state designated as nonattainment by EPA (Federal Register, March 3, 1978) and the State of Florida (Ch 17-2, FAC, 1982) are:

1. Sulfur Dioxide
   a. The northwest corner of Pinellas County
2. Ozone
   a. Duval County
   b. Orange County
   c. Pinellas County
   d. Hillsborough County
   e. Dade County
   f. Broward County
   g. Palm Beach County
3. Particulate Matter
   a. Downtown Jacksonville area
   b. A 7.5-mi radius circle in Hillsborough County

The U.S. Sugar Clewiston mill is located in Hendry County, which is designated as attainment for all pollutants. The closest nonattainment area to the mill is Palm Beach County, which is designated as nonattainment for ozone. It is noted that current Florida DER regulations provide that the Palm Beach County ozone nonattainment area will become attainment by March 31, 1984 (FAC, Chapter 17-2.410). This date is prior to the project start-up date of the new boiler of October 1984.

2.2 FEDERAL AND STATE PSD

2.2.1 General Requirements

Under federal PSD review requirements, all major new or modified sources of air pollutants regulated under CAA must be reviewed and approved by EPA (or in this case, reviewed by DER since review authority has been delegated to the state: Federal Register, Vol. 48, No. 226, November 22, 1983). A "major stationary source" is defined as any one of 28 named source categories which has the potential to emit 100 TPY or more, or any other stationary source which has the potential to emit 250 TPY or more, of any pollutant regulated under CAA. "Potential to emit" means the capability at maximum design capacity to emit a pollutant after the application of control equipment.

"Major modification" means any physical change in the design or operation of a major stationary source, or a series of contemporaneous changes in the design or operation of a major stationary source, that would result in a significant net emission increase of any pollutant regulated under CAA. "Significant" is defined as any increase in emissions in excess of specified levels (Table 2-2).

PSD review is used to determine whether significant air quality deterioration will result from the new or modified source. PSD requirements are contained in 40 CFR 52.21, Prevention of Significant Deterioration of Air Quality, and in the State of Florida PSD Regulations (Ch 17-2, FAC). Major sources are required to undergo the following reviews related to PSD for each pollutant emitted in significant amounts:

1. Control technology review,
2. Source impact analysis,
3. Air quality analysis (monitoring), and
4. Additional impact analyses.

Requirements for each of these areas are discussed in more detail below.

2.2.2 Increments/Classifications

Congress, in promulgating the 1977 CAA Amendments, specified that certain increases above an air quality "baseline concentration" level of SO_2 and PM concentrations would constitute significant deterioration. The magnitude of the increment that cannot be exceeded depends on the classification of the area in which a new source (or modification) will

Table 2-2. Federal and State of Florida PSD Significant Emission Rates

Pollutant	Regulated Under	Federal and State Significant Emission Rate (TPY)
Sulfur Dioxide	NAAQS, NSPS	40
Particulate Matter	NAAQS, NSPS	25
Nitrogen Oxides	NAAQS, NSPS	40
Carbon Monoxide	NAAQS, NSPS	100
Ozone	NAAQS, NSPS	40*
Lead	NAAQS	0.6
Sulfuric Acid Mist	NSPS	7
Total Fluorides	NSPS	3
Total Reduced Sulfur	NSPS	10
Reduced Sulfur Compounds	NSPS	10
Hydrogen Sulfide	NSPS	10
Asbestos	NESHAP	0.007
Beryllium	NESHAP	0.0004
Mercury	NESHAP	0.1
Vinyl Chloride	NESHAP	1
Benzene	NESHAP	0
Radionuclides	NESHAP	0
Inorganic Arsenic	NESHAP	0
Any Regulated Pollutant	--	Class I Impact†

* Increase in Volatile Organic Compound emissions.
† Any emission rate for a source located within 10 km of a Class I area which causes impacts of 1 ug/m^3, 24-hour average, or greater.

Notes: TPY = Tons per year
NAAQS = National Ambient Air Quality Standards.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.

Source: Code of Federal Regulations, Title 40, Part 52.21.

have an impact. Three classifications were designated based on criteria established in the CAA Amendments. Initially, Congress promulgated areas as Class I (international parks, national wilderness areas, and memorial parks larger than 5,000 acres; and national parks larger than 6,000 acres) or Class II (all other areas not designated as Class I). No Class III areas, which would be allowed greater deterioration than Class II areas, were designated. However, the states were given the authority to redesignate any Class II area to Class III status, provided certain requirements were met. EPA then promulgated as regulations the requirements for classifications and area designations. The State of Florida has adopted the EPA class designations and allowable PSD increments (Table 2-3).

The term "baseline concentration" evolves from federal and state PSD regulations and denotes a fictitious concentration level corresponding to a specified baseline date and certain additional baseline sources. The baseline concentration is comprised of the predicted impact of the baseline emissions and a representative background concentration, which refers to concentration levels due to sources not accounted for in the point source emission inventories (i.e., natural and distant manmade sources).

Currently, EPA and DER have different methods for calculating baseline concentrations for short-term averaging periods. With 5 years of meteorological data, DER defines baseline concentration as the second-highest concentration predicted for each receptor point from the baseline sources and emission rates. EPA methodology does not calculate an actual baseline concentration, but bases increment consumption on the net effect of increment-consuming and increment-expanding emissions. Since EPA methodology results in higher increment consumption values, increment consumption will be calculated by the EPA method for this PSD application.

Within Florida, there are four Class I areas: Everglades National Park, Chassahowitzka National Wilderness Area, St. Marks National Wilderness

Table 2-3. Federal* and State† PSD Allowable Increments

Pollutant/Averaging Time	Allowable Increment (ug/m^3) Class I	Class II	Class III
Particulate Matter			
Annual Geometric Mean	5	19	37
24-Hour Maximum**	10	37	75
Sulfur Dioxide			
Annual Arithmetic Mean	2	20	40
24-Hour Maximum**	5	91	182
3-Hour Maximum**	25	512	700

* 40 CFR Part 52, Section 52.21.
† Ch 17-2, FAC.
**Maximum concentration not to be exceeded more than once per year.

Source: ESE, 1983.

Area, and Bradwell Bay Wilderness Area. All of these Class I areas are more than 62 mi (100 kilometers) from the Clewiston mill site. The Everglades National Park Class I area is the closest and is located approximately 69 mi (110 kilometers) to the south. All other areas of the state classified as attainment or unclassifiable are designated Class II areas.

2.2.3 Control Technology Review

The control technology review requirements of the federal PSD regulations stipulate that all applicable federal and state emission-limiting standards be met, and that BACT be applied to control emissions from the source. The BACT requirements are applicable to all pollutants for which the increase in emissions from the source or modification exceeds the significant emission rate (see Table 2-2).

The proposed Boiler 4 will fire bagasse up to 545.5 x 10^6 Btu/hr heat input and fuel oil up to 225.0 x 10^6 Btu/hr. As a result, the boiler will not be subject to any federal NSPS. State of Florida emission standards for carbonaceous fuel burners will apply. These standards limit PM emissions to 0.2 lb/10^6 Btu when burning bagasse and 0.1 lb/10^6 Btu for heat input due to oil burning. No other state emission standards apply, other than an opacity standard. Opacity is limited to 30 percent, except that up to 40 percent is allowed for no more than 2 minutes in any 1-hour period.

The federally promulgated NESHAP (40 CFR 61) does not apply to the Clewiston mill, since bagasse/oil-fired boilers are not regulated under NESHAP.

Under EPA's implementation of the CAA Amendments, the basic control technology requirement is the application and evaluation of BACT. BACT is defined as follows [40 CFR 52.21(b)(12)]:

> An emission limitation...based on the maximum degree of reduction for each pollutant...which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable... for control of such pollutant.

In December 1978, EPA's Office of Air, Noise, and Radiation published Guidelines for the Evaluation of BACT to assist states and EPA Regional Offices in making BACT determinations. The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with state emission limits. An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than NSPS, is also required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems as well as the environmental benefits derived from these systems.

2.2.4 Air Quality Analysis

In accordance with requirements of 40 CFR 52.21(m), any application for a PSD permit must contain, for each pollutant regulated under CAA, an analysis of continuous ambient air quality data in the area affected by the proposed major stationary source or major modification. For a new major source, the affected pollutants are those that the source would potentially emit in a significant amount.

According to CAA, ambient air monitoring for a period of up to 1 year generally is appropriate to complete the PSD requirements of CAA. Existing data from the vicinity of the proposed source may be utilized, if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in EPA's Ambient Monitoring Guidelines for Prevention of Significant Deterioration (EPA, November 1980).

The regulations include an exemption which excludes or limits the pollutants for which an air quality analysis is conducted. This exemption states that the Administrator may exempt a proposed major stationary source or major modification from the monitoring requirements of 40 CFR 52.21(m) with respect to a particular pollutant if the emissions increase of the pollutant from the source or modification would cause, in any area, air quality impacts less than the federal de minimis levels presented in Table 2-4.

The State of Florida has passed similar PSD air quality analysis requirements. EPA and State of Florida de minimis air quality impact levels are currently identical. However, it should be noted that, in February 1981, EPA revised the de minimis levels and average times for three of the pollutants in the "Ambient Monitoring Guidelines for PSD" (EPA, February 1981). The averaging period for the de minimis level for lead was changed to 3 months, and the de minimis impact levels for beryllium and hydrogen sulfide were changed to 0.001 microgram per cubic meter (ug/m^3) and 0.2 ug/m^3, respectively. Those revisions, however, have not been made in the Code of Federal Regulations, and, therefore, the original federal (and State of Florida) de minimis levels technically still apply.

2.2.5 Source Impact Analysis

A source impact analysis must be performed by a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rates (Table 2-2). The PSD regulations specifically require the use of atmospheric dispersion models in performing impact analysis, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models must normally be used in performing the impact analysis. Specific applications for other than EPA-approved models require EPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the EPA publication, "Guideline on Air Quality Models" (EPA, 1978).

Table 2-4. Federal and State of Florida PSD De Minimis Impact Levels

Pollutant	De Minimis Air Quality Impact Level (ug/m^3) Code of Federal Regulations	EPA Ambient Monitoring Guidelines	State of Florida
Sulfur Dioxide	13, 24-hour	13, 24-hour	13, 24-hour
Particulate Matter	10, 24-hour	10, 24-hour	10, 24-hour
Nitrogen Oxides	14, annual	14, annual	14, annual
Carbon Monoxide	575, 8-hour	575, 8-hour	575, 8-hour
Ozone	100 tons/yr*	100 tons/yr*	100 tons/yr*
Lead	0.1, 24-hour	0.1, 3-month	0.1, 24-hour
Sulfuric Acid Mist	†	†	†
Total Fluorides	0.25, 24-hour	0.25, 24-hour	0.25, 24-hour
Total Reduced Sulfur	10, 1-hour	†	10, 1-hour
Reduced Sulfur Compounds	10, 1-hour	†	10, 1-hour
Hydrogen Sulfide	0.04, 1-hour	0.2, 1-hour	0.04, 1-hour
Asbestos	†	†	†
Beryllium	0.0005, 24-hour	0.001, 24-hour	0.0005, 24-hour
Mercury	0.25, 24-hour	0.25, 24-hour	0.25, 24-hour
Vinyl Chloride	15, 24-hour	15, 24-hour	15, 24-hour
Benzene	†	†	†
Radionuclides	†	†	†
Inorganic Arsenic	†	†	†

* Increase in VOC emissions.
† No ambient air measurement method; no monitoring required.

Sources: 40 CFR 52.21(i)(8).
FAC, Chapter 17-2.500.
Ambient Monitoring Guidelines for Prevention of Significant Deterioration, EPA, November 1980.

Various lengths of record for meteorological data can be utilized for impact analysis. A 5-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If fewer than 5 years of meteorological data are used, the highest concentration at each receptor must be used.

2.2.6 Additional Impact Analysis

In addition to air quality impact analyses, federal PSD regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source. These analyses are to be conducted primarily for PSD Class I areas. Impacts due to general commercial, residential, industrial, and other growth associated with the source must also be addressed. These analyses are required for each pollutant emitted in significant amounts.

2.2.7 Good Engineering Practice (GEP) Stack Height

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds GEP or any other dispersion technique. On February 8, 1982, EPA promulgated final stack height regulations (EPA, February 8, 1982). Guidelines were published by EPA in July 1981 to assist in the determination of the GEP stack height.

GEP stack height is defined as the highest of:

1. 65 m, or
2. A height established by applying the formula:

   $H_g = H + 1.5L$

where: H_g = GEP stack height,
H = Height of the structure or nearby structure, and
L = Lesser dimension (height or projected width) of nearby structure(s).

"Nearby" is defined as a distance up to five times the lesser of the height or width dimension of a structure or terrain feature, but not greater than 0.5 mi. While GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height, the actual stack height may be greater.

The stack height regulations also allow increased GEP stack height beyond that resulting from the above formula in cases where "plume impaction" occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with "elevated terrain." "Elevated terrain" is defined as terrain which exceeds the height calculated by the GEP stack height formula. Because the terrain in the vicinity of the Clewiston mill site is flat, plume impaction was not considered in determining the GEP stack height for the Clewiston mill.

2.3 SOURCE APPLICABILITY

2.3.1 Pollutant Applicability

Current actual Clewiston mill emissions of PM, SO_2, NO_x, CO, and volatile organic compounds (VOCs) were estimated based on the average fuel usage at the mill for the last 2 calendar years (1981 and 1982). Both bagasse and No. 6 fuel oil were burned at the mill. The fuel usage figures, broken out by boiler, are shown in Table 2-5. Bagasse usage during 1981 and 1982 was similar, but fuel oil usage in 1982 was much lower than in 1981. Also shown in Table 2-5 are the average moisture content of the bagasse, the assumed sulfur content of the bagasse (no bagasse samples have been analyzed at the Clewiston mill), and the estimated sulfur

Table 2-5. Fuel Usage at Clewiston Mill, 1981 and 1982 Calendar Years

Boiler	Bagasse Usage (tons/yr)*			Fuel Oil Usage (gal/yr)		
	1981	1982	Average	1981	1982	Average
1	145,040	129,508	137,274	174,600	137,300	155,950
2	122,115	117,477	119,796	176,700	78,100	127,400
3	66,660	65,462	66,061	113,300	76,100	94,700
5	31,423	28,662	30,043	0	0	0
6	31,981	13,092	22,537	0	0	0
Total	397,219	354,201	375,711	464,600	291,500	378,050
Percent H_2O	52.3	52.0	52.2	--	--	--
Percent Sulfur	0.2†	0.2†	0.2†	2.4	2.4	2.4

* As-fired (wet) basis.
† Sulfur in bagasse not measured at Clewiston mill; assumed value is consistent with all calculations in this application.

Source: U.S. Sugar Corporation, 1981, 1982.

content of the fuel oil based on Belcher Oil information (see Appendix A for fuel analysis data).

Emissions of the criteria pollutants were estimated in a manner consistent with emission estimates for the proposed Boiler 4. Boiler 4 emission estimates are shown in Appendix G, and calculations of current emissions from Boilers 1, 2, 3, 5, and 6 are shown in Appendix H. The emissions are summarized in Table 2-6.

Contemporaneous emission decreases at the Clewiston mill will occur in conjunction with operation of Boiler 4. The east and west pellet mills did not operate in 1982 and 1983 and will remain shut down. Since this reduction in emissions has occurred within the last 5 years, it can be used as an offset in determining PSD applicability. Emission reductions were calculated from actual fuel usage and production rates for the last 2 years of operation (1980 and 1981 for the pellet plants). Supportive calculations are shown in Appendix I.

The estimated emission reductions, the net change in emissions, and PSD significant emission rates are shown in Table 2-6. The Clewiston mill is an existing major source, since emissions of any regulated pollutant exceed 250 tons/year. The net increase in emissions will exceed the PSD significant emission rates for PM, SO_2, NO_x, CO, and VOC. As a result, the proposed modification is a "major" modification under PSD regulations, and these pollutants are required to undergo PSD review, as described in Section 2.2.

Emission estimates for lead and the noncriteria regulated pollutants were not calculated for the current mill conditions. Estimated emissions of these pollutants for the proposed Boiler 4 only, shown in Table 2-7, are all below the PSD significant emission rate, except for arsenic. Any credit for emission reductions would only reduce these amounts. As a result, only arsenic need undergo PSD review. Boiler 4 emissions for these pollutants were calculated based on fuel oil

Table 2-6. Current Emissions, Emission Offsets, and Net Increases in Emissions for Regulated Criteria Pollutants

	Emissions (tons/yr)				
	PM	SO_2	NO_x	CO	VOC
Current Emissions					
Boilers 1, 2, 3, 5, and 6					
Bagasse	431	359	225	359	319
Fuel Oil	3	74	13	1	<1
Total	434	433	238	360	319
Emission Decreases					
Pellet Plants					
Fuel Oil	6	18	3	0.2	<1
Emission Increases					
Boiler 4 (proposed)	238	382	206	298	281
Net Change	+232	+364	+238	+298	+281
PSD Significant Emission Rate	25	40	40	100	40

Note: Does not account for increases for Boilers 1, 2, and 3 due to routine operation such as an increase in operating hours or fuel oil usage.

Source: ESE, 1983.

Table 2-7. Estimated Emissions of Lead and Noncriteria Pollutants for the Proposed Boiler 4

Pollutant	Estimated Emissions (tons/yr)	PSD Significant Emission Rate (tons/yr)
Mercury	0.00008	0.1
Beryllium	0.00017	0.0004
Fluorides	0.00024	3.0
Sulfuric Acid Mist	3.7	7.0
Arsenic	0.0016	0
Lead	0.007	0.6

Note: Emissions of all other regulated pollutants cannot be estimated since no emission factors exist.

Source: ESE, 1983.

consumption only (maximum of 500,000 gallons per year), since no emission factors are available for bagasse burning.

2.3.2 GEP Stack Height

Shown in Figure 2-1 is a layout of the Clewiston mill, detailing building dimensions and elevations. The Boiler House, which houses all of the existing boilers and will also house the proposed Boiler 4, is on the average about 60 feet in height and 101 feet by 303 feet in length. The GEP formula applied to this building yields:

$$HGEP = 1.5H + L = 1.5(60) + 60 = 150 \text{ feet.}$$

The height of the proposed Boiler 4 will be 150 feet and, therefore, will not exceed GEP based upon the Boiler House. Other than the Boiler House, the next most significant structure at the mill which could influence the proposed Boiler 4 stack is the Boiling House. This structure is 90 feet high and 217 feet by 220 feet in length. The GEP height for this building is:

$$HGEP = 1.5H + L = 1.5(90) + 90 = 225 \text{ feet.}$$

The proposed Boiler 4 stack will be less than this height. This building would only influence the boiler stacks for certain wind directions (i.e., from about 280° to 350° and from about 100° to 170° from north).

2.3.3 Ambient Monitoring Exemption

An exemption from the ambient monitoring requirements of PSD regulations may be granted if the net increase in impacts due to the major modification are less than the <u>de minimis</u> impact levels (see Table 2-4). Using the modeling methodology described in Section 5.0, impacts of the proposed Boiler 4 were predicted only for the pollutants subject to PSD and for which a <u>de minimis</u> level exists (i.e., PM, SO_2, NO_x, and CO). The maximum predicted impacts were as follows:

PM: 8 ug/m^3, 24-hour average

SO_2: 52 ug/m^3, 24-hour average

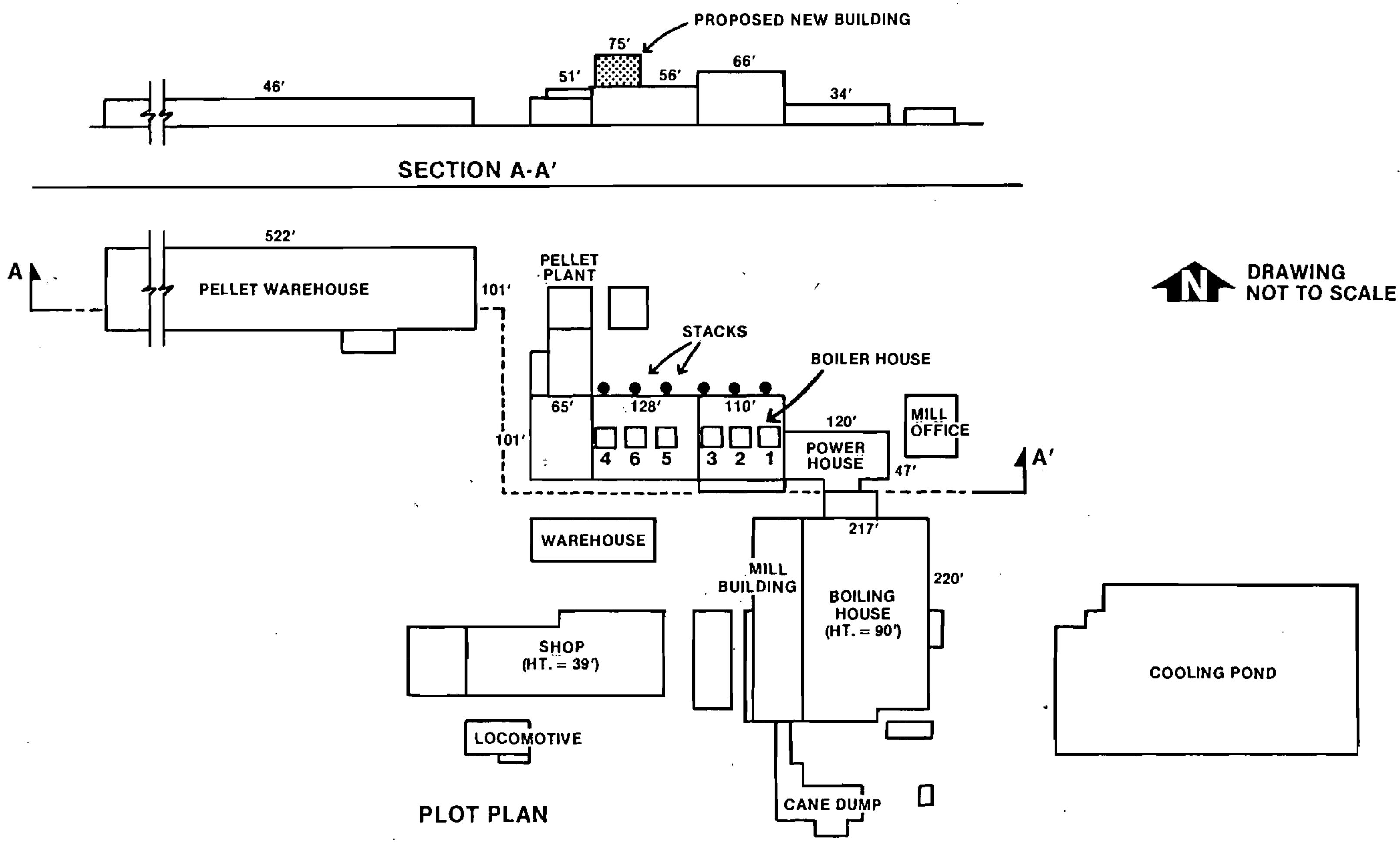

Figure 2-1
PLOT PLAN FOR CLEWISTON MILL

SOURCE: ESE, 1983.

U.S. SUGAR
CORPORATION
Clewiston, Florida

NO_x: 0.5 ug/m^3, annual average
CO: 17 ug/m^3, 8-hour average

For PM and CO, these impacts were estimated for total bagasse burning, which results in worst-case emissions. Maximum SO_2 and NO_x emissions and impacts for the proposed Boiler 4 only occur under maximum fuel oil burning conditions, i.e., 150,000 lb/hr steam (225 x 10^6 Btu/hr) due to oil burning with remaining steam capacity supplied by bagasse burning. The estimated exhaust gas flow rate for Boiler 4 burning the maximum amount of fuel oil is shown in Appendix F.

The annual averaging time is specified for the de minimis impact level for NO_x. Maximum actual NO_x emissions from the proposed Boiler 4 are estimated at 206 tons/yr. The SO_2 model run for Boiler 4 only simulates 642.9 lb/hr for Boiler 4, equivalent to 1,404 tons/yr (at 182 days per year operation). Therefore, the annual SO_2 impacts from this model run were ratioed by 206/1,404 to obtain annual NO_x impacts from Boiler 4 only.

As shown above, only SO_2 impacts due to Boiler 4 operation exceed the de minimis impact level. However, total estimated VOC emissions (281 tons/yr) will also exceed the 100 tons per year de minimis level. These pollutants will require an air quality monitoring analysis according to PSD requirements. Impacts of PM, NO_x, and CO are below the de minimis levels and may be granted an exemption from the preconstruction monitoring requirements.

3.0 BEST AVAILABLE CONTROL TECHNOLOGY EVALUATION

The source applicability analysis for the proposed Clewiston Boiler 4, presented in Section 2.0, identified the following emitted air pollutants as requiring a BACT review under federal and state PSD regulations:

Particulate Matter (PM)
Sulfur Dioxide (SO_2)
Nitrogen Oxides (NO_x)
Carbon Monoxide (CO)
Volatile Organic Compounds (VOC)
Arsenic (As)

The State of Florida has received review authority for the federal PSD program (Federal Register, Vol. 48, No. 226, November 22, 1983). In addition, Florida has passed PSD regulations and BACT requirements similar to EPA. DER defines BACT as follows [Ch 17-2.100(22), FAC]:

> An emission limitation, including a visible emissions standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of each such pollutant . . . Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.

The remainder of this section describes the proposed BACT and emission limit for each pollutant subject to BACT. An analysis of alternative control technologies, including economic, energy, and environmental considerations, is also presented.

3.1 PARTICULATE MATTER

3.1.1 Proposed Particulate Matter BACT

On the basis of environmental, energy, and economic impacts, the Western Precipitation (Joy) Turbulaire impingement scrubber, Type D, Size 150, or equivalent design, was selected as BACT for the proposed bagasse/

oil-fired boiler. This system is well demonstrated on existing bagasse/oil-fired boilers in the industry, has a proven operational record with high reliability and low maintenance, and displays low-energy requirements (ΔP = 5 to 9 inches H_2O). The proposed scrubber will operate at a pressure drop of about 5.5 inches H_2O, which is in the range recommended by the manufacturer. Above this range, increased wear of scrubber surfaces, increased particulate entrainment, increased fan capacity, and increased energy input reduce the effectiveness of the system. Water flow rate through the scrubber will be in the range of 200 to 300 gallons per minute (gpm).

In an impingement scrubber, the gas to be cleaned passes through a peripheral nozzle and is guided downward at high velocity into a liquid bath. The level of the liquid bath is maintained slightly below the nozzle by means of an adjustable weir. Collection of flue gas particles is by both direct impaction with the liquid bath and by collision with droplets atomized by the action of the gas stream upon the liquid bath. Mist elimination, achieved by centrifugal action and swirl vanes, precedes gas discharge.

The proposed BACT emission limit for PM when burning bagasse was determined by a source-specific analysis of impingement scrubber performance at the U.S. Sugar Clewiston and Bryant mills. Boilers 1, 2, and 3 at the Clewiston mill were considered in the analysis since these have the same scrubber configuration as the proposed boiler (i.e., scrubber before the I.D. fan). Boilers 5 and 6 at Clewiston have the I.D. fan before the scrubber, and the data from these installations are not considered to be representative of the proposed boiler because the I.D. fan may create smaller particles, making them harder to capture.

Boiler 5 at the U.S. Sugar Bryant mill was also evaluated since the boiler is of the same size as the proposed Boiler 4 (250,000 lb stm/hr) and has an identical spray impingement scrubber (Type D, Size 150). All source tests conducted at Bryant Boiler 5 to date, including those which failed to meet the allowable PM emission rate of 0.15 $lb/10^6$ Btu, were considered.

Boilers 1 and 2 at Clewiston have also reached steam production capacities near 250,000 lb/hr. Prior to the 1980-81 crop season, Boiler 3 at Clewiston had the I.D. fan ahead of the scrubber, and therefore these data were not included in the analysis.

A compilation of PM source tests from the identified boilers is presented in Appendix D. All of these tests were conducted while the boilers were burning bagasse with no fuel oil or minimal amounts of fuel oil. The results of a statistical analysis of the PM emission compliance tests are shown in Table 3-1. Compliance tests are the average of three consecutive individual tests. Compliance emission tests at the three Clewiston boilers have ranged from 0.12 to 0.22 $lb/10^6$ Btu, and averaged 0.17 $lb/10^6$ Btu. For Bryant 5, the compliance tests results ranged from 0.08 $lb/10^6$ Btu to 0.23 $lb/10^6$ Btu, with an average of 0.16 $lb/10^6$ Btu, close to that of the Clewiston boilers. These wide variations in emission rates make it difficult to define an emission limit which can be met all of the time.

As a minimum, the new boiler must meet an emission limit of 0.2 $lb/10^6$ Btu when firing bagasse, which is the State of Florida emission limit. This level of emission was therefore used as a starting point in defining the BACT emission limit. To determine the expected frequency of occurrence of exceedance of the 0.2 $lb/10^6$ Btu level by the new boiler, the statistical data shown in Table 3-1 were utilized. The correlation coefficients shown are for the lines of best fit passed through the data as plotted on a log-probability graph, according to the method of Larsen (1971). The extremely high correlation coefficients (1.0 = perfect correlation) show that the data are essentially log-normally distributed. Therefore, according to Larsen, the following equation is used to relate the value at a particular frequency of occurrence to the geometric mean and standard geometric deviation values:

$$C = MgSg^{Z}$$

Table 3-1. Analysis of Particulate Compliance Tests, U.S. Sugar Clewiston and Bryant Mills

Mill/ Boiler	No. of Tests	Particulate Emissions ($lb/10^6$ Btu) Maximum	Minimum	Average	Geometric Mean	Standard Geometric Deviation	Correlation Coefficient
Clewis-ton/1-3	18	0.22	0.12	0.17	0.17	1.17	0.992
Bryant/5	12	0.23	0.08	0.16	0.16	1.40	0.965

Source: ESE, 1983.

where: C = parameter value at frequency Z,
Mg = geometric mean,
Sg = standard geometric deviation, and
Z = number of standard deviations between the particular frequency and the median.

Rearranging the equation to solve for Z, and using the data in Table 3-1 and a parameter value of C = 0.20 lb/10^6 Btu, results in the following:

Clewiston 1-3: Z = 1.04 (85th percentile)
Bryant 5: Z = 0.66 (75th percentile)

This shows that an emission level of 0.2 lb/10^6 Btu for the proposed Boiler 4 would be expected to be exceeded 15 percent of the time based upon Clewiston Boilers 1-3 data, and 25 percent of the time based upon Bryant 5 data. These expected frequencies of exceedance are considered marginally acceptable by U.S. Sugar; a lower BACT emission limit is not justified. Therefore, the proposed BACT emission limit for PM when burning bagasse is equal to the State of Florida emission standard of 0.2 lb/10^6 Btu. The proposed PM BACT limit when burning fuel oil is 0.1 lb/10^6 Btu and is equal to the Florida emission standard for oil burning.

The environmental impact of the proposed Boiler 4 is considered to be small at the proposed BACT emission levels. Maximum PM impacts due to the new boiler are predicted to be 0.4 ug/m^3, annual average, and 8 ug/m^3, 24-hour average. These impacts represent less than 6 percent of the Florida AAQS and less than 25 percent of the allowable Class II PSD increments.

3.1.2 Alternative Particulate Control Technologies

Wet Scrubber Alternatives

Wet scrubbers are the only control devices currently in operation on bagasse/oil-fired steam boilers in the Florida sugar industry. These scrubbers are mainly of the spray impingement type. Venturi scrubbers are also utilized on a few bagasse/oil-fired boilers in Florida. The recently published Background Information document for Nonfossil Fuel-Fired Industrial Boilers (EPA, 1982) shows that wet scrubbers are the only PM control devices currently in use on bagasse-fired boilers in the United States, other than low-efficiency centrifugal collectors. Wet scrubbers are also employed on most wood-fired boilers in the United States. The following is a summary of current scrubber installations on bagasse/oil-fired boilers in Florida.

Mill	No. of Bagasse/ Oil Boilers	No. of Spray Impingement Scrubbers	No. of Venturi Scrubbers
U.S. Sugar Clewiston	5	5	0
U.S. Sugar Bryant	4	4	0
Sugar Cane Growers Coop.	6	6	0
Osceola Farms	5	5	0
Atlantic Sugar Association	5	5	0
Gulf & Western Foods	8	5	3
Talisman	3	0	3
TOTAL	36	30	6

Spray impingement scrubbers represent 83 percent of all scrubbers currently in use, with venturi scrubbers accounting for the remaining 17 percent.

The most important design parameters for scrubbers are the liquid-to-gas ratio (amount of water used per unit volume of gas treated) and the intimacy of contact between the liquid and gas phases. The venturi scrubber and spray impingement scrubber were the wet scrubber designs considered for the Clewiston Boiler 4. These two scrubber types are currently the only types operating in the Florida sugar industry.

In the venturi scrubber, the gases are passed through a venturi throat where low-pressure water is added. Extreme turbulence in the venturi throat atomizes the water into small droplets and promotes intimate contact. The wetted particles and droplets are then collected in a mist elimination device. For a given collection efficiency, these devices normally require a greater pressure drop than the impingement scrubber. In addition, pretreatment mechanical collectors are normally necessary to remove the larger abrasive particles in order to decrease wear on the venturi surfaces.

Fabric Filter

Particulate emission controls via fabric filtration techniques (baghouse) have not been installed on any bagasse-fired boiler. Few full-scale baghouses have been installed on any types of nonfossil-fuel-fired boilers (EPA, 1982). Seven baghouses have been installed on wood-fired boilers, and one on a municipal incinerator. Two of the baghouses on wood-fired boilers have experienced baghouse fires. The principal drawback foreseen by potential users of baghouses is a fire danger resulting from collection of combustible carbonaceous fly ash. The fire potential could possibly be reduced by extensive modifications and precautions, but most such measures have not been demonstrated in actual application, and particularly not on bagasse-fired boilers.

Additional problems with baghouses are plugging, solid waste disposal of a dry product, and potential high maintenance costs for filter replacement. A disadvantage to fabric filtration is its inability to remove other primary gaseous pollutants from the gas stream (i.e., SO_2). Another control device would be required to remove soluble pollutants such as SO_2. Because of the unproven ability of baghouses to operate reliably and effectively on bagasse-fired boilers, they were not considered further in the BACT analysis.

Electrostatic Precipitators

Electrostatic precipitators (ESP) are in operation on wood- and solid-waste-fired boilers. However, they have not been applied to bagasse-fired boilers. Precipitator vendors contacted recently and a study conducted several years ago indicate that electrostatic precipitation of bagasse ash would probably not be feasible. The vendors also caution against possible fire hazard and explosion potential. Information does not exist on the resistivity of bagasse fly ash, and, therefore, the difficulties in collecting the fly ash cannot currently be defined. The Background Information document (EPA, 1982) makes no mention of the suitability of applying ESPs to bagasse boilers.

Particulate collection in an ESP is accomplished by first imparting an electrical charge to the particles, allowing the charged particles to migrate to a collecting electrode, and dislodging the collected particles from the collecting electrodes. Particle charging is normally accomplished with a high-voltage DC corona. Particle removal is performed by rapping or vibrating the collecting electrodes.

ESPs, which must be guarded against corrosion, have the inherent disadvantage of removing only particulate matter. Another control device would be needed to remove soluble pollutants such as SO_2. Disposal of a dry solid waste product would also be required.

Because of the lack of any pilot-plant or full-scale test data on ESPs applied to bagasse boilers, this technology is considered to be unproven and was not considered further in the BACT analysis.

Gravel-bed and Electrostatic Gravel-bed Filtration
The Background Information document (EPA, 1982) identifies gravel-bed filters and electrostatic gravel-bed filters as potentially applicable to bagasse boilers for PM control. These devices remove PM from the gas stream by means of a moving bed of filter media. Electrostatic filters augment the gravel-bed by electrostatically precipitating particles and enhancing collection. However, no such devices have been applied to bagasse boilers in the United States. Since the fly ash is collected in the dry state, the explosion and fire potential exists with this technology as with the baghouse technology. In addition, the effectiveness of an electrostatic filter to enhance PM collection is questionable. The Background Information document states that "very little data are available to assess the factors affecting the

performance of gravel-bed filters and electrostatic gravel-bed filters" (pg. 4-41). Because of the unproven ability of these devices on bagasse boilers, they were not considered further in the BACT analysis.

3.1.3 Alternatives Analysis

The preceding section (3.1.2) showed that, of the alternative control technologies, only the venturi scrubber has been proven on bagasse-fired boilers. A venturi scrubber was not chosen for BACT because it has not proven to be a more efficient control device than the spray impingement scrubber. BACT guidelines do not require further analysis of alternative control systems which cannot achieve a greater degree of emission reduction than the proposed BACT. The venturi is also considerably more expensive to install and operate, requires a greater pressure drop (2 to 3 times that of the impingement scrubber), with a correspondingly greater energy consumption, and requires more water. The higher maintenance costs are due to the abrasive nature of the fly ash and high gas velocities encountered in the venturi and across the exhaust fan, which accelerates wear of exposed surfaces. Venturis must be preceded by mechanical collectors to reduce wear, which further increases capital and operating costs of the system.

Venturi scrubbers are currently operating on a total of six boilers in the Florida sugar industry. Table 3-2 summarizes annual compliance tests for each of these scrubbers. At both Gulf & Western and Talisman, mechanical cyclone collectors precede the venturi scrubbers in order to remove larger particles. At Gulf & Western, the venturi scrubber typically operates at a pressure drop of 16 inches H_2O. At Talisman, the venturis operate typically at 14 inches H_2O pressure drop. As shown, test results have varied widely, ranging from 0.09 $lb/10^6$ Btu to 0.30 $lb/10^6$ Btu. The average of all tests for all boilers is 0.20 $lb/10^6$ Btu. Boiler 6 at Talisman has displayed below average test results, ranging from 0.09 to 0.15 $lb/10^6$ Btu and averaging 0.13 $lb/10^6$ Btu. The data show that the venturi scrubbers have not achieved a greater degree of emission reduction than that achieved with the impingement scrubber.

Table 3-2. Florida Sugar Industry Venturi Scrubber Compliance Tests

		Particulate Emissions			
		lb/hr		$lb/10^6$ Btu	
Boiler	Test Date	Actual	Allowable	Actual	Allowable
		GULF & WESTERN FOODS			
10	1979-80	43.1	39.2	0.22	0.3
10	1980-81*	31.2	46.2	0.14	0.2
10	1-6-82	53.3	45.8	0.23	0.2
11	1979-80	35.4	45.1	0.16	0.2
11	1980-81	53.0	51.1	0.21	0.2
11	1980-81	34.7	47.7	0.15	0.2
11	12-10-81	53.5	44.1	0.24	0.2
11	12-14-82	39.3	48.0	0.16	0.2
15	1-10-83	44.6	54.0	0.17	0.2
		TALISMAN			
4	1-6-76	58.0	61.5	0.28	0.3
4	2-2-77	54.4	61.2	0.27	0.3
4	1-25-78	64.6	66.6	0.29	0.3
4	12-18-78	25.7	44.7	0.17	0.3
4	2-13-80	49.6	56.0	0.27	0.3
4	1-28-81	42.7	59.1	0.22	0.3
4	1-27-82	51.1	68.0	0.23	0.3
4	2-21-83	26.8	67.4	0.12	0.3
5	1-6-76	56.9	63.5	0.27	0.3
5	2-25-77	43.7	50.7	0.26	0.3
5	1-20-78	38.0	38.3	0.30	0.3
5	12-20-78	38.6	44.2	0.26	0.3
5	2-7-80	46.8	59.0	0.24	0.3
5	2-2-81	52.4	57.3	0.27	0.3
5	2-12-82	58.8	72.6	0.24	0.3
5	2-12-83	43.9	77.2	0.17	0.3
6	1-26-76	31.5	73.5	0.09	0.2
6	1-27-78	45.2	86.0	0.11	0.2
6	1-3-79	43.9	72.7	0.12	0.2
6	2-11-80	59.3	84.6	0.14	0.2
6	2-4-81	61.2	80.2	0.15	0.2
6	2-11-82	64.0	110.9	0.12	0.2
6	2-11-83	76.2	99.1	0.15	0.2

* Modified to vertical orientation this season.

Source: ESE, 1983.

3.2 SULFUR DIOXIDE

The analysis presented in Appendix E shows that the spray impingement scrubber, which is the selected PM BACT control device, will also remove 60 percent or more of the SO_2 in the boiler exhaust gas system. The pH of the scrubber water used at the Clewiston mill has been measured in the range of 7 to 8, which is alkaline to neutral, and theoretically should absorb SO_2 from the gas stream.

The SO_2 test data from bagasse boilers also show a significant reduction in theoretical SO_2 emissions elsewhere in the process, resulting in overall reduction of greater than 90 percent of the theoretical amount of SO_2. This additional reduction probably takes place in the boiler, where the bottom ash and fly ash absorb the SO_2.

Because of the high inherent removal efficiency of the spray impingement scrubber (when scrubber water of about pH 7 or above is used and the fact that the scrubber is already required for PM removal, this technology is chosen as BACT for SO_2 when firing bagasse in the proposed Boiler 4. The corresponding BACT emission limit is 0.25 lb/10^6 Btu due to bagasse firing.

No other available SO_2 control techniques, such as flue gas desulfurization (FGD), can reliably reduce SO_2 flue gas concentrations by 90 percent and greater. An FGD system applied to the proposed boiler would have a capital cost of greater than $2 million and annual operating and maintenance costs of greater than $1 million. Such a system would have little air quality benefit, owing to the relatively low impacts of the proposed Boiler 4 only, would create a significant solid and liquid waste problem, and would consume a a significant amount of energy.

A 50-percent SO_2 control efficiency due to the spray impingement scrubber was assumed in developing emission rates and air quality impacts for the new boiler. When burning bagasse, actual SO_2 emissions are expected to be much lower. A conservative 50-percent SO_2 reduction was also assumed for the existing boilers at Clewiston.

The proposed BACT for fuel oil firing is the minimization of the use of No. 6 fuel oil with a maximum sulfur content of 2.5 percent. The intent of U.S. Sugar Corporation has and always will be to minimize the burning of fuel oil in the existing boilers as well as the proposed Boiler 4. For example, during 1982 fuel oil provided less than 2 percent of the Clewiston mill's total heat input requirements. Oil is normally required for starting up the boilers at the beginning of the crop-year (generally requires less than 24 hours). After startup, oil will only be fired when the supply of bagasse to the boiler is interrupted.

Bagasse is a waste product and is free fuel. Oil is very costly; therefore, pure economics dictate an absolute minimization of fuel oil usage. The permit application allows for up to 500,000 gallons per year of fuel oil to be burned in the proposed boiler. Actual fuel oil usage is expected to be well below this level. The fuel oil usage in 1982 for the entire Clewiston mill was only 291,500 gallons.

The SO_2 emissions due to oil firing are also conservatively estimated in the application, since no SO_2 removal across the spray impingement scrubbers was assumed. Only limited test data currently exist for the Florida sugar cane industry on SO_2 removals while burning oil (see Appendix E), partly because such tests are very costly in terms of fuel cost. But owing to the alkaline nature of the scrubber water, it is likely that significant SO_2 removal does occur when firing oil.

The firing of a lower sulfur content fuel oil in the proposed boiler (i.e., 1.0 percent) is an alternative control technology for SO_2 when firing fuel oil. Such a control technology would be more costly to U.S. Sugar Corporation, owing to the differential between 2.5- and 1.0-percent sulfur fuel oil, which is currently $3/bbl, but could be substantially higher in the future. Such a technology also would not result in significant environmental benefits, since the amount of fuel oil in the proposed boiler will be minimized, and because the existing bagasse/oil-fired boilers at the Clewiston mill (Boilers 1, 2, and 3) will continue to use 2.5-percent (maximum) fuel oil in the future.

3.3 NITROGEN DIOXIDE

3.3.1 Proposed Nitrogen Dioxide BACT

The proposed BACT for NO_x is good firing and operational practices applied to the bagasse/oil-fired boiler. The boiler U.S. Sugar Corporation is procuring for Boiler 4 was originally developed to burn coal and gas (see Appendix B). As a result, modifications to the boiler must be made to accommodate bagasse and oil. The stoker will be of the traveling-grate type. The proposed BACT emission limit is 0.17 lb/10^6 Btu when firing bagasse and 0.45 lb/10^6 Btu due to oil firing, which are the estimated uncontrolled emissions when burning these fuels.

3.3.2 Available Nitrogen Oxides Control Techniques

Several techniques for controlling NO_x formation in boilers are currently available. These include:

1. Low excess air firing,
2. Staged combustion,
3. Flue gas recirculation,
4. Low NO_x burners, and
5. Ammonia injection.

Most of these techniques are not applicable to bagasse-fired boilers. Low NO_x burners cannot be used when burning material such as bagasse in a spreader-stoker or traveling- grate boiler. Excess air, typically in the range of 30 to 50 percent for these boilers, is required to aid in drying of the moisture-laden carbonaceous material and to ensure complete combustion. The low combustion temperatures encountered in bagasse-fired boilers inherently limit potential NO_x formation, as does the low nitrogen content of bagasse (typically 0.3 percent).

The Background Information document (EPA, 1982) states that NO_x controls have not been applied to nonfossil fuel boilers because of their relatively low NO_x emissions. Further, comprehensive test data substantiating the performance of NO_x control techniques for bagasse boilers and bagasse/oil-fired boilers are not available.

Some limited NO_x test data are available from the Florida sugar industry boilers (Table 3-3). One test, performed by Monsanto Research Corporation (1980) at the U.S. Sugar Bryant mill, showed very low levels of NO_x, averaging 0.0018 lb/10^6 Btu when burning bagasse. Tests conducted on Sugar Cane Growers Cooperative Boiler 8, when deducting NO_x contributions due to oil burning, resulted in higher bagasse NO_x emissions, averaging 0.084 lb/10^6 Btu. NO_x testing has also been conducted at Osceola Farms Boiler 6, but these test data were not available for this analysis. However, the available data indicate that the AP-42 emission factor used in this application for Clewiston Boiler 4 is very conservative.

Based upon the above considerations, good firing and operational practices are considered to be best BACT for reducing NO_x emissions. Therefore, no other technologies were considered further.

3.4 CARBON MONOXIDE AND VOLATILE ORGANIC COMPOUNDS

The selected BACT for the control of CO and VOC emissions from the boilers are good boiler design and operation and good firing practices. There are no known feasible, economic post-combustion controls for these pollutants for fossil or nonfossil-fuel-fired boilers. Promoting complete combustion in the boiler is the only feasible method for reducing VOC and CO emissions. However, it is cautioned that such measures, which include high excess air firing, tend to increase NO_x emissions. The boiler will be designed for maximum efficiency, which is directly related to the most complete combustion possible.

Table 3-3. Summary of NO_x Emission Tests on Bagasse Boilers in the Florida Sugar Industry

Boiler	Date	Steam Load (lb/hr)	NO_x Emissions lb/hr	NO_x Emissions lb/10^6 Btu
		U.S. SUGAR BRYANT		
2	12-17-79	142,000	0.23	0.0013
2	12-18-79	151,000	0.38	0.0020
2	12-18-79	144,000	0.42	0.0022
		SUGAR CANE GROWERS COOP		
8	2-4-83	246,429	43.1 (65.5)*	0.104
8	2-4-83	243,250	29.2 (53.4)*	0.072
8	2-4-83	254,211	32.3 (55.8)*	0.076

* Figures shown are NO_x attributable to bagasse firing. Number in parentheses is total NO_x attritable to bagasse and oil firing. Approximately 55 x 10^6 Btu/hr due to oil firing during tests, and 415 x 10^6 Btu/hr due to bagasse firing. NO_x due to oil firing based upon AP-42 factor of 67 lb/10^3 gal is deducted from total NO_x.

Source: ESE, 1983.

The proposed BACT emission limits for CO are 0.25 $lb/10^6$ Btu when firing bagasse and 0.033 $lb/10^6$ Btu when firing oil. For VOC, the limits are 0.24 $lb/10^6$ Btu when firing bagasse, and 0.0070 $lb/10^6$ Btu when firing oil. These emission factors are based on data for wood-waste and oil firing (see Appendix G).

3.5 ARSENIC

Because arsenic is a trace substance and is emitted as a solid particulate from oil burning, the proposed wet spray impingement scrubber which controls PM emissions will also control arsenic emissions. The wet scrubber is the proposed BACT, and the small emissions of this pollutant do not justify a more stringent control. The proposed BACT emission rate is 41.9 $lb/10^{12}$ Btu heat input due to oil.

4.0 AIR QUALITY (MONITORING) ANALYSIS

4.1 MONITORING REQUIREMENTS

The Clean Air Act Amendments of August 1977 require that the owner of any proposed major air pollution source conduct ambient air monitoring for applicable pollutants for a period of 1 year prior to submission of a construction permit application. The use of existing representative data may be permitted in lieu of monitoring, provided the data meet EPA PSD monitoring criteria.

As determined by the source applicability analysis, SO_2 and VOC (ozone) require an ambient monitoring analysis under PSD regulations. However, PM monitoring data are also needed to estimate a background PM air quality concentration level. The background concentration will be added to modeled impacts in Section 5.0 to determine total maximum PM air quality levels. Each of these pollutants is addressed in the following sections.

4.2 TOTAL SUSPENDED PARTICULATE (TSP)

The Florida Sugar Cane League (FSCL) operates and maintains a PSD-approved ambient monitoring network in the Florida sugar industry area. The monitoring network was approved by the Florida DER in September 1982 (see Appendix J) and began collecting PSD acceptable data in October 1982. The two PSD stations located within 10 km of the Clewiston mill (#7 and #19) are shown in Figure 4-1.

Station #7 is located atop the FSCL offices in Clewiston, about 2 km north of the Clewiston mill. Station #19 is located about 10 km due south of the mill, surrounded by sugar cane fields. These two stations are considered appropriate for determining a representative background TSP concentration.

The TSP data collected through December 8, 1983, at the two stations are summarized in Table 4-1. Station #7 reflects moderate maximum 24-hour concentrations, but a rather high arithmetic mean and geometric mean,

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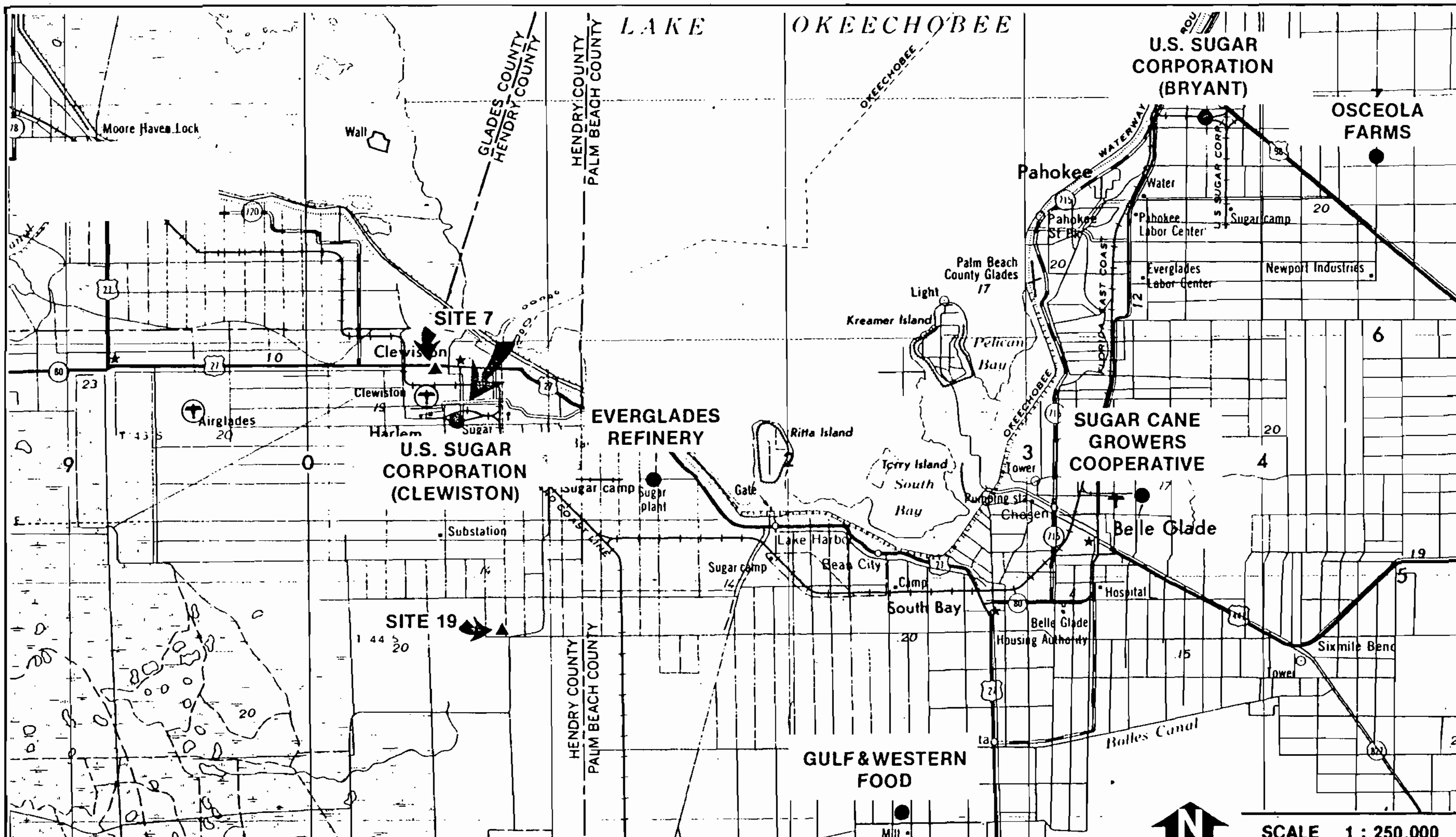

Figure 4-1
LOCATIONS OF TSP MONITORING SITES WITHIN 10 KILOMETERS OF CLEWISTON MILL

SOURCE: ESE, 1983.

U.S. SUGAR CORPORATION
Clewiston, Florida

Table 4-1. Summary of 24-hour TSP Monitoring Data (ug/m^3), FSCL Stations #7 and #19, October 1982 to December 1983

Station	No. of Obs.	Maximum	Second Highest	Arithmetic Mean	Geometric Mean
7	71	113	107	50	47
19	61	214	194	49	41

Source: ESE, 1983.

likely an effect of the vehicular traffic in the Clewiston area. This station also should experience influence from the Clewiston mill, since it is located only 2 km away.

Station #19, located in a remote area about 10 km south of the Clewiston mill, experienced two TSP values above the Florida AAQS of 150 $ug/^3$. A third value close to the standard was also experienced (142 ug/m^3), but all other 24-hour concentrations were less than 100 ug/m^3. The two highest measured values were attributed to sugar cane field fires. The third high value (142 ug/m^3) is also thought to be due to field fires. The station should not be influenced significantly by the Clewiston mill due to its distance from the mill. Since the station is located in an area devoid of human residences, the high measured levels are not of as much concern as if they had occurred in Clewiston.

If the three highest values recorded at Station #19, all believed to be due to cane fires, are discarded from the data set, the resulting arithmetic mean concentration becomes 42 ug/m^3. A representative background concentration was considered to be the average of this value and the arithmetic mean recorded at Clewiston (50 ug/m^3), or 46 ug/m^3. This concentration was used for both the annual average background and the 24-hour background concentration. The estimated background concentrations will be added to dispersion modeling results in Section 5.0. The dispersion models considered all significant PM sources located within 50 km of the Clewiston mill.

4.3 SULFUR DIOXIDE (SO_2)

SO_2 monitoring has been conducted by the FSCL as part of the PSD monitoring network described in Section 4.2. The network consists of one continuous monitor located in Belle Glade. The data obtained from the station were not available for this report, but could be made available in the near future if deemed necessary by the Florida DER. No other PSD acceptable data are known to be available for the sugar industry area.

For modeling purposes, an SO_2 background concentration of 20 ug/m^3 was assumed. Because the emission inventory used in the dispersion modeling analysis considered all significant SO_2 sources within 50 km of the Clewiston mill, this background level is considered to be conservative.

4.4 OZONE (O_3)

Ambient ozone monitoring has been conducted by the FSCL as part of the PSD-approved monitoring network. The network consists of one continuous O_3 monitor located in Belle Glade. The data obtained for this station were not available for this report, but could be made available in the near future if deemed necessary by the Florida DER.

No recognized techniques exist for estimating impacts upon O_3 levels due to VOC emissions from the proposed Boiler 4. Therefore, it is not necessary to develop a background O_3 concentration.

5.0 SOURCE IMPACT ANALYSIS

5.1 EMISSIONS INVENTORY

The area within 50 km of the Clewiston mill was inventoried for point sources of particulate and SO_2 emissions. The basis for this inventory was the 1981 Air Permit Inventory System (APIS); information on file at ESE's offices in Gainesville, Florida; previous PSD impact studies performed by ESE for other sugar mills; and information on file at DER's Ft. Myers office. Maximum allowable or permitted emission rates were used in the inventory.

The inventory includes all the sugar mills and sugar refineries in Palm Beach and Hendry Counties, the Florida Power & Light Martin generating station (Units 1 and 2), and additional sources in Belle Glade. All sources located in West Palm Beach were excluded from the inventory because they were well beyond the 50-km distance. The emission inventory for the Clewiston mill was presented in Section 1.0 for PM and SO_2 emissions.

5.2 DISPERSION MODELS AND METEOROLOGY

Both short-term (i.e., 24-hours or less) and long-term (crop-season) impacts were predicted with the Industrial Source Complex short-term model. The model is a DER- and EPA-approved Gaussian dispersion model. Rural dispersion characteristics and default input parameters were used in the model.

Five years (1970 to 1974) of historical surface meteorological data recorded at West Palm Beach Airport were used in the model analysis. Upper atmosphere observations were recorded at Miami for the same time period. Only the period from 15 October through 15 April was modeled to reflect the seasonal operation of the plant (182 crop-days per year).

The 182-day average impact results produced by the model were divided by two to reflect the annual average impact. Appropriate background air quality levels, developed in Section 4.0, were added to modeled concentrations to predict total air quality impacts. Since 5 years of meteorological data were used, highest, second-highest short-term impacts were identified for comparison to air quality standards.

Initial modeling with 5 years of meteorological data was performed for emissions from the Clewiston mill only. The critical meteorology and approximate location of highest, second-highest concentrations were determined with a radial receptor grid covering 36 directions every 300 meters from the plant center, with all Clewiston boilers portrayed as colocated. The impacts were refined with receptors within a 1-km square grid and placed at 100-meter intervals. All sources in the emission inventory were included in all refined modeling runs.

5.3 IMPACT ANALYSIS RESULTS

5.3.1 Particulate Matter

The results of the PM source impact analysis are summarized in Table 5-1. Maximum annual and highest, second-highest 24-hour impacts are shown for the proposed Boiler 4 only, for the Clewiston mill with Boilers 1 through 4 operating, for all modeled sources, and for the total predicted impacts due to all modeled sources plus the background air quality level. Maximum Boiler 4-only impacts, reflecting total bagasse burning and maximum PM emissions, are shown to be relatively low, representing less than 6 percent of the Florida AAQS.

The maximum 24-hour "all sources" impact is only slightly higher than the "Clewiston mill" impacts, indicating that other modeled sources do not contribute significantly under the worst-case meteorologial conditions. The maximum total predicted 24-hour PM impact is predicted to be 149 ug/m^3, which is below the Florida AAQS of 150 ug/m^3. The maximum total annual average impact is 52 ug/m^3, which is well below the AAQS of 60 ug/m^3. These impacts reflect the worst-case Clewiston mill PM emissions scenario described in Section 1.0.

Table 5-1. Particulate Matter Impact Analysis Results

	Averaging Time						
	Annual*			24-Hour†			
Scenario	Concentration (ug/m^3)	Distance (m)	Direction (degrees)	Concentration (ug/m^3)	Year/Day	Distance (m)	Direction (degrees)
Proposed Boiler 4 Only	0.4	1,800	260, 270	8	1971/319	1,800	260
Clewiston Mill with Boiler 4 Operating	5.9	900	260	102	1971/327	900	260
All Modeled Sources with Boiler 4 Operating	—	—	—	103	1971/327	900	260
Total Impacts with Boiler 4 Operating**	51.9	900	260	149	1971/327	900	260
Interaction Cases††							
Gulf & Western/Talisman				75	1973/21	900	320
U.S. Sugar Bryant/ Osceola Farms				99	1972/306	900	250
Sugar Cane Growers/ Florida Refinery				65	1970/61	900	280
Atlantic/Everglades Refinery				86	1973/65	1,200	290
FPL Martin				82	1974/314	900	230

* 1982-day average, as predicted by model, divided by 2.
† Highest, second-highest impacts from 5 years of meteorological data.
** Includes a 46-ug/m^3 background concentration; see Section 4.0 for derivation.
†† Does not include estimated background concentration

Source: ESE, 1983.

The possibility of 24-hour interaction of the Clewiston mill with surrounding sources to produce higher concentrations was also investigated. The critical meteorology in the directions aligning the significant sources was determined. Maximum concentrations were determined in these interacting directions with the critical meteorological conditions. Table 5-1 also gives the results of this investigation. It is seen that no source interactions occur which produce higher concentrations than those due to the Clewiston mill alone.

5.3.2 Sulfur Dioxide

The results of the SO_2 impact analysis are shown in Table 5-2. As for the PM analysis, results are shown for various source scenarios. Maximum predicted Boiler 4 impacts are only 20 percent of the Florida AAQS for SO_2. These impacts were predicted assuming maximum fuel oil burning for each day of the crop season, which is a very conservative assumption since Boiler 4 will be limited to 500,000 gal/yr of fuel oil consumption.

As with the PM results, highest, second-highest 24-hour "all sources" impacts are only slightly higher than the "Clewiston mill" impacts, indicating negligible contribution from other modeled sources during the specified meteorological conditions. These impacts reflect the worst-case Clewiston mill 24-hour and 3-hour SO_2 emission scenarios described in Section 1.0. The total predicted 24-hour SO_2 impact, including background, is 248 ug/m^3, compared to the AAQS of 260 ug/m^3. The predicted maximum total annual average SO_2 impact is 32.5 ug/m^3, which is roughly one- half of the AAQS of 60 ug/m^3. The predicted maximum total 3-hour SO_2 impact, including background, is 590 ug/m^3, compared to the AAQS of 1,300 ug/m^3.

SO_2 interaction case results are also shown in Table 5-2. As in the case of the PM interactions, the SO_2 interaction concentrations are all below those produced due to the Clewiston mill alone.

Table 5-2. Sulfur Dioxide Impact Analysis Results

	Averaging Time										
	Annual*			24-Hour†				3-Hour†			
Scenario	Concentration (ug/m^3)	Distance (m)	Direction (°)	Concentration (ug/m^3)	Year/Day	Distance (m)	Direction (°)	Concentration (ug/m^3)	Year/Day/Period	Distance (m)	Direction (°)
Proposed Boiler 4 Only Maximum Impact***	3.1	1,500	260	52	1974/74	1,600	270	161	1972/297/5	900	280
Clewiston Mill with Boiler 4 Operating	12.5	900	260	227	1971/327	900	260	569	1971/105/1	900	270
All Modeled Sources with Boiler 4 Operating	—	—	—	228	1971/327	900	260	570	1971/105/1	900	270
Total Impacts with Boiler 4 Operating**	32.5	900	260	248	1971/327	900	260	590	1971/105/1	900	270
Interaction Cases††											
Gulf & Western/ Talisman				163	1973/21	900	320	593	1973/329/5	900	320
U.S. Sugar Bryant/ Osceola Farms				212	1972/306	900	250	562	1972/94/5	900	250
Sugar Cane Growers/ Florida Refinery				147	1970/61	900	280	553	1972/297/5	600	280
Atlantic/Everglades Refinery				190	1973/65	1,500	290	495	1972/57/5	900	290
FPL Martin				187	1974/314	1,200	230	565	1973/294/8	1,200	230

* 182-day average, as predicted by model, divided by 2.
† Highest, second-highest impacts from 5 years of meteorological data.
** Includes estimated background concentration of 20 ug/m^3; see Section 4.0 for derivation.
†† Does not include estimated background concentration of 20 ug/m^3.
*** Reflects maximum fuel oil burning and maximum SO_2 emissions.

Source: ESE, 1983.

5.3.3 Nitrogen Dioxide

Only the annual averaging time must be considered for NO_x impact analysis, since the only NO_x AAQS is an annual standard. Maximum annual emissions of NO_x are estimated at 206 tons per year for the proposed Boiler 4, and occur due to maximum fuel oil burning conditions with the remainder of steam capacity from bagasse firing (see Appendix G). To estimate the annual average NO_x impact due to Boiler 4 only, the SO_2 annual impacts of Boiler 4 only were adjusted by the ratio of SO_2 to NO_x emissions. The modeled SO_2 emissions were 642.9 lb/hr or 1,404 tons (for 182-day crop-year). The resulting maximum annual average NO_x concentration due to Boiler 4 operation is 0.5 ug/m^3 (3.1 x 206 ÷ 1,404). This impact is less than the NO_x significance level of 1 ug/m^3, annual average; therefore, no further impact analysis is required for NO_x.

5.3.4 Carbon Monoxide

CO impacts from the proposed Boiler 4 only were determined with the ISCST model. Worst-case CO emissions occur under total bagasse burning (136.4 lb/hr). Both the 1-hour and 8-hour averaging times were assessed. Maximum predicted impacts were determined to be 39 ug/m^3, 1-hour average, and 17 ug/m^3, 8-hour average. These impacts are well below the significance levels of 2,000 ug/m^3, 1-hour average, and 500 ug/m^3, 8-hour average. Therefore, these impacts are minimal, should not cause or contribute to violations of the CO AAQS, and no further impact analysis is required.

5.3.5 Increment Consumption

Both federal and state PSD regulations require a demonstration that a proposed source will not cause or contribute to increases in ambient concentrations of PM or SO_2 greater than a specified amount over a baseline concentration. Since January 1, 1975 (the baseline date for major sources as established by EPA and Florida DER), construction permits were issued for PM scrubbers for Boilers 5 and 6 at the Clewiston mill (Table 5-3). This means that for the baseline situation,

Table 5-3. Permit History of U.S. Sugar Corporation--Clewiston Mill

Unit	Permit No.	Date Issued	Comments
Boiler 1	A026-2028	5/16/73	Operating permit
	AC26-2028A	7/12/74	Added Joy scrubber
Boiler 2	AO-26-2029	5/16/73	Operating permit
	AC26-2029A	7/12/74	Added Joy scrubber
Boiler 3	A026-2030	5/16/73	Operating permit
	AC26-2030A	7/15/74	Added Joy scrubber
Boiler 5	A026-2031	5/16/73	Operating permit
	AC26-2031A	1/15/75	Added Joy scrubber
Boiler 6	A026-2032	5/16/73	Operating permit
	AC26-2032A	1/15/75	Added Joy scrubber
East Pellet Plant	AC502	11/07/72	
	A026-2035A	4/15/76	Operating permit--changed furnace type
	A026-50204	9/16/82	Operating permit renewal
West Pellet Plant	AC26-2141	11/18/74	Upgrade dryer and add scrubber
	A026-2141	5/27/75	Operating permit for scrubber
	A026-50205	9/16/82	Operating permit renewal

Source: ESE, 1983.

these boilers were uncontrolled for PM and SO_2 emissions, and baseline emissions for PM would be on the order of 10 times the controlled amount, and for SO_2 two times the controlled amount.

The East and West Pellet plants will be shut down in conjunction with the proposed Boiler 4 operation. These changes will provide increment expansion and will act to offset the increment consumption due to the proposed Boiler 4 only. The maximum impacts of Boiler 4 only will be less than 25 percent of the Class II PSD increments for PM and less than 20 percent of the Class II PSD increments for SO_2 under normal operating conditions (i.e., total bagasse burning). These relatively small increment-consuming impacts, the increment expansion provided by the East and West Pellet plants, the high baseline emissions for Boilers 5 and 6, and the lack of any other increment-consuming emissions in the vicinity of the Clewiston mill demonstrate that the proposed Boiler 4 will not cause or contribute to violation of any PSD Class II allowable increments.

6.0 ADDITIONAL IMPACT ANALYSIS

6.1 IMPACTS UPON VEGETATION

The site of the proposed U.S. Sugar facility at Clewiston is less than 3 miles southwest of Lake Okeechobee and approximately 10 miles north of the Everglades border. The major crops grown in the vicinity of the site are sugar cane, vegetables, and some pasture grasses. Maximum concentrations of criteria pollutants are predicted to occur approximately 1 km from the source.

6.1.1 Total Suspended Particulates

Predicted maximum levels of total suspended particulates (TSP) are a 24-hour average concentration of 149 ug/m^3 and an annual average concentration of 52 ug/m^3. Plants are adversely affected by particulate matter only at grossly high concentrations that result in surface depositions of 1 to 4 g/m^2/day (Lerman and Darley, 1975). Surface deposition from the predicted maximum levels of particulates would be a small fraction of the levels known to impact plant growth and will have no significant effect on vegetation in the region of the site. The wet scrubbers controlling particulate matter emissions at the Clewiston mill will effectively capture large particles in the exhaust gas streams of the boilers. Particulates which are not collected by the scrubbers will be primarily of small particle size and will tend to remain suspended in the atmosphere.

6.1.2 Nitrogen Oxides

The predicted maximum increase in annual concentrations of nitrogen oxides due to the proposed Boiler 4 is less than 1 ug/m^3. No information is available on the sensitivity of sugar cane to nitrogen oxides; however, Ashenden (1979) reported no effect on orchard grass after exposure to 127 ug/m^3 NO_2 for 20 weeks. Bluegrass, in contrast, showed growth reduction when exposed to the same doses. These concentrations are much greater than those expected from the proposed facility, and no adverse impacts on vegetation from nitrogen oxides are expected.

6.1.3 Sulfur Dioxide

The total maximum predicted 3-hour average concentration of SO_2 is 590 ug/m^3; the total maximum predicted 24-hour average is 248 ug/m^3. Concentrations which are at or near the maximum levels will occur infrequently during the year. Concentrations will decrease sharply beyond the distance to the maximum concentrations (i.e., about 1 km). The predicted maximum annual average SO_2 concentration is 32.5 ug/m^3.

No information is available on the sensitivity of sugar cane to SO_2. There has been no discernible damage to cane surrounding the present facilities. Table 6-1 presents concentrations of SO_2 known to adversely affect grasses which have been tested. Concentrations of SO_2 which affect sweet corn and tomatoes are also provided in Table 6-1, since these crops are grown in the region. Orchard grass exhibited reduced growth at concentrations approximating the predicted annual average, but all other species were adversely affected at SO_2 doses much higher than those predicted. At worst, localized growth reduction of cane may occur about 1 km from the facility.

6.2 IMPACTS UPON SOILS

Soils in the vicinity of the site consist primarily of peats and mucks. Mucks near the rim of Lake Okeechobee are organic soils mixed with silt and clay; they contain microelements which the peats lack and are highly valued for agriculture. Sandy soils also occur in the region.

Organic soils act as nutrient traps and can adsorb sulfates, nitrates, and any metals resulting from deposition of sulfur dioxide, nitrogen oxides, and particulates with little change in pH. Deposition of these gases can increase acidity of sandy soils; however, the low concentrations resulting from the proposed source will have a negligible effect on soil pH. Soils in this area that are utilized for agriculture are commonly amended with lime, thus any tendency towards lower pH would be neutralized. Area crops may benefit from the additional sulfur and nitrogen in the soil.

Table 6-1. Lowest Doses of SO_2 Reported to Affect Growth of Sweet Corn, Tomato, and Some Grasses

Species	Lowest SO_2 Dose Known to Affect Species (ug/m^3)	Reference
Rye Grass	367, for 131 days reduced growth	Ayazloo and Bell, 1981
Orchard Grass	37 to 62, for 72 days reduced growth	Crittenden and Read, 1979
Oats	1,048, for 3 hours four times during life cycle reduced growth	Heck and Dunning, 1978
Sweet Corn	812, for 7 days causes chlorosis, but no yield effects	Mandl _et al._, 1975
Tomato	1,258, for 5 hours on each of 57 days reduced growth	Kohut _et al._, 1982

Source: ESE, 1983.

6.3 VISIBILITY IMPACTS

A Level I visibility screening analysis (EPA, 1980) was conducted which confirmed that no visibility impairment should occur in the Everglades National Park Class I area. The absolute values of the three Level I contrast parameters (C1--plume contrast against the sky, C2--plume contrast against terrain, and C3--change in the sky/terrain contrast caused by primary and secondary aerosol) are well below 0.10. Thus, it is highly unlikely that the emissions source would cause adverse visibility impairment in Class I areas. Locally, the emissions from the proposed Boiler 4 must meet the State of Florida opacity standard of 20 percent. Compliance with this standard should ensure no significant impacts to local visibility conditions.

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APPENDIX A

FUEL ANALYSIS INFORMATION
U.S. SUGAR CORPORATION

file
WC 6

U.S. Sugar Corp (Mr. T. Brinson - Superintendent
Bryant Sugar House)

(Mr. J.R. Orsenigo)

A.N. (PID) Raw Lab TJG

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613
A SUBSIDIARY OF THE RILEY COMPANY

FUELS LABORATORY

TEST REPORT

Laboratory No. 22,318 Sample of Bagasse Date Rec'd 2/9/79

Received From U.S. Sugar Corp. Bryant Sugar House Clewiston, Fla

Sample Data Bagasse Sample #1 2/6/79 1 pm Bourne Plantation Field #18 - B - 19
Variety CL - 59 - 1052 Hand Cut

Contract No. (641-91110) P.O. #82566 Field Sample By Customer

Air Drying Loss 30.6 %

Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	33.2 %	------	Moisture	%	-------
Volatile	57.6 %	86.3 %	Carbon	%	48.6
Ash	0.5 %	0.7 %	Hydrogen	%	6.1
Fixed Carbon	8.7 %	13.0 %	Nitrogen *	%	0.3
	100.0 %	100.0 %	Oxygen (diff.)	%	44.1
British Thermal Units	5,444	8,150	Sulfur	%	0.2
Fusibility of Ash			Ash	%	0.7
Initial Deformation		F		100.0 %	100.0
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

(*Skinner & Sherman)

Date March 20, 1979 Thomas J. Gallagher

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FUELS LABORATORY

TEST REPORT

Laboratory No. 22,319 Sample of Bagasse Date Rec'd 2/9/79

Received From U.S. Sugar Corp. Bryant Sugar House Clewiston, Fla

Sample Data Bagasse Sample #2 2/6/79 4 pm Bryant Plantation Field #17-L-26 Variety CL-49-172 Hand Cut

Contract No. (641-91110) P.O. #82566 Field Sample By Customer

Air Drying Loss		13.2 %			
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	16.2 %	------	Moisture	%	--------
Volatile	74.9 %	89.4 %	Carbon	%	48.5 %
Ash	0.2 %	0.2 %	Hydrogen	%	6.0 %
Fixed Carbon	8.7 %	10.4 %	Nitrogen *	%	0.24 %
	100.0 %	100.0 %	Oxygen (diff.)	%	44.86 %
British Thermal Units	6,922	8,260	Sulfur	%	0.2 %
Fusibility of Ash			Ash	%	0.2 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

(*Skinner & Sherman)

Date March 20, 1979 Thomas J. Gallagher

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A SUBSIDIARY OF THE RILEY COMPANY

FUELS LABORATORY

TEST REPORT

Laboratory No. 22,320 Sample of Bagasse Date Rec'd 2/9/79

Received From U.S. Sugar Corp. Bryant Sugar House Clewiston, Fla

Sample Data Bagasse Sample #3 2/7/79 9:20 am South Okeechobee Grower
Field #46-PJ-10W Variety CP-57-603 Hand Cut

Contract No. (641-91110) P.O. #82566 Field Sample By Customer

Air Drying Loss	20.1 %				
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	23.3 %	-----	Moisture	%	--------
Volatile	66.1 %	86.1 %	Carbon	%	47.2 %
Ash	2.5 %	3.3 %	Hydrogen	%	5.8 %
Fixed Carbon	8.1 %	10.6 %	Nitrogen *	%	0.31 %
	100.0 %	100.0 %	Oxygen (diff.)	%	43.29 %
British Thermal Units	5,979	7,795	Sulfur	%	0.1 %
Fusibility of Ash			Ash	%	3.3 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

(*Skinner & Sherman)

Date March 20, 1979 Thomas J. Gallagher

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PM-10-11777

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FUELS LABORATORY

TEST REPORT

Laboratory No. 22,321 Sample of Bagasse Date Rec'd 2/9/79

Received From U.S. Sugar Corp. Bryant Sugar House Clewiston, Fla

Sample Data Bagasse Sample #4 2/7/79 10:00 AM Runyon Plantation Field #37-L-8 Variety CL - 41 - 233 Machine Cut

Contract No. (641-91110) P.O. #82566 Field Sample By Customer

Air Drying Loss	0.4 %				
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	2.9 %	-----	Moisture	%	-------
Volatile	82.2 %	84.7 %	Carbon	%	47.5 %
Ash	3.1 %	3.2 %	Hydrogen	%	6.0 %
Fixed Carbon	11.8 %	12.1 %	Nitrogen *	%	0.34 %
	100.0 %	100.0 %	Oxygen (diff.)	%	42.86 %
British Thermal Units	7,593	7,820	Sulfur	%	0.1 %
Fusibility of Ash			Ash	%	3.2 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

(*Skinner and Sherman)

Date March 20, 1979 Thomas J. Gallagher

RILEY | RILEY STOKER CORPORATION

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FUELS LABORATORY

TEST REPORT

Laboratory No. 22,322 Sample of Bagasse Date Rec'd 2/9/79

Received From U.S. Sugar Corp. Bryant Sugar House Clewiston, Fla

Sample Data Bagasse Sample #5 2/7/79 11:50 AM Bryant Plantation
Field #17-C-34 Variety CL-65-260 Hand Cut

Contract No. (641-91110) P.O. # 82566 Field Sample By Customer

Air Drying Loss		18.2 %			
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	21.1 %	------	Moisture	%	-------
Volatile	68.6 %	86.9 %	Carbon	%	47.8 %
Ash	1.3 %	1.7 %	Hydrogen	%	5.9 %
Fixed Carbon	9.0 %	11.4 %	Nitrogen *	%	0.26 %
	100.0 %	100.0 %	Oxygen (diff.)	%	44.24 %
British Thermal Units	6,391	8,100	Sulfur	%	0.1 %
Fusibility of Ash			Ash	%	1.7 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

(*Skinner & Sherman)

Date March 20, 1979 Thomas J. Gallagher

Belcher

ANALYSIS OF 2.5% BUNKER "C"

TANK #201

AT PORT EVERGLADES, FLORIDA

OCTOBER 29, 1981

API, GRAVITY @ 60* F.	12.0
SULFUR, TOTAL WT.	2.41%
VISCOSITY, CTS @ 50* C.	390 SFCS
VANADIUM, PPM	204
B S & W	0.1%
FLASH, POINT *F.	+200
POUR, POINT *F.	+40
HEAT OF COMBUSTION, BTU/GAL.	147,258

Carl Bloomberg

Carl Bloomberg
Area Manager

BELCHER OIL COMPANY, P.O. BOX 8296, 1733 HILL AVENUE, MANGONIA PARK,
WEST PALM BEACH, FLORIDA 33407 PHONE(305) 848-1495

Belcher

ANALYSIS OF 2.5% BUNKER "C"

TANK #201

AT PORT EVERGLADES, FLORIDA

NOVEMBER 3, 1981

API, GRAVITY @ 60*F.	12.5
SULFUR, TOTAL WT.	2.39%
VISCOSITY, CTS @ 50* C.	452 SECS.
VANADIUM, PPM	250
B S & W	0.1%
FLASH, POINT *F.	+200
POUR, POINT *F.	+45
HEAT OF COMBUSTION, BTU/GAL.	146,760

Carl Bloomberg
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WEST PALM BEACH, FLORIDA 33407 PHONE(305) 848 1495

Belcher

OCTOBER 29, 1982

ANALYSIS OF BUNKER C TANK #201 AT
PORT EVERGLADES FOR WEST PALM BEACH

API GRAVITY, @ 60* F.	10.5
SULPHUR	2.36%
FLASH POINT, * F	+200
POUR POINT, * F	+35
BS&W	0.2%
VISCOSITY, CTS@50 * C	429
VANADIUM, PPM	380
BTU'S PER GALLON	148,805
BTU'S PER POUND	17,970

Carl Bloomberg

CARL BLOOMBERG
Area Manager

BELCHER OIL COMPANY, P.O. BOX 8296, 1733 HILL AVENUE, MANGONIA PARK,
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APPENDIX B

SPECIFICATIONS FOR PROPOSED BOILER 4

Note: The manufacturer data presented herein is for the 250,000 PPH Bryant mill, Boiler No. 5 (Permit A-050-7096 - dated Oct. 16, 1980) which is of similar furnace and boiler configuration and overall heat transfer surface since no data is available for the boiler for this permit application when fired with bagasse.

Attached are comparison data and general arrangement drawings for each boiler showing the similarity in general design between these two boilers.

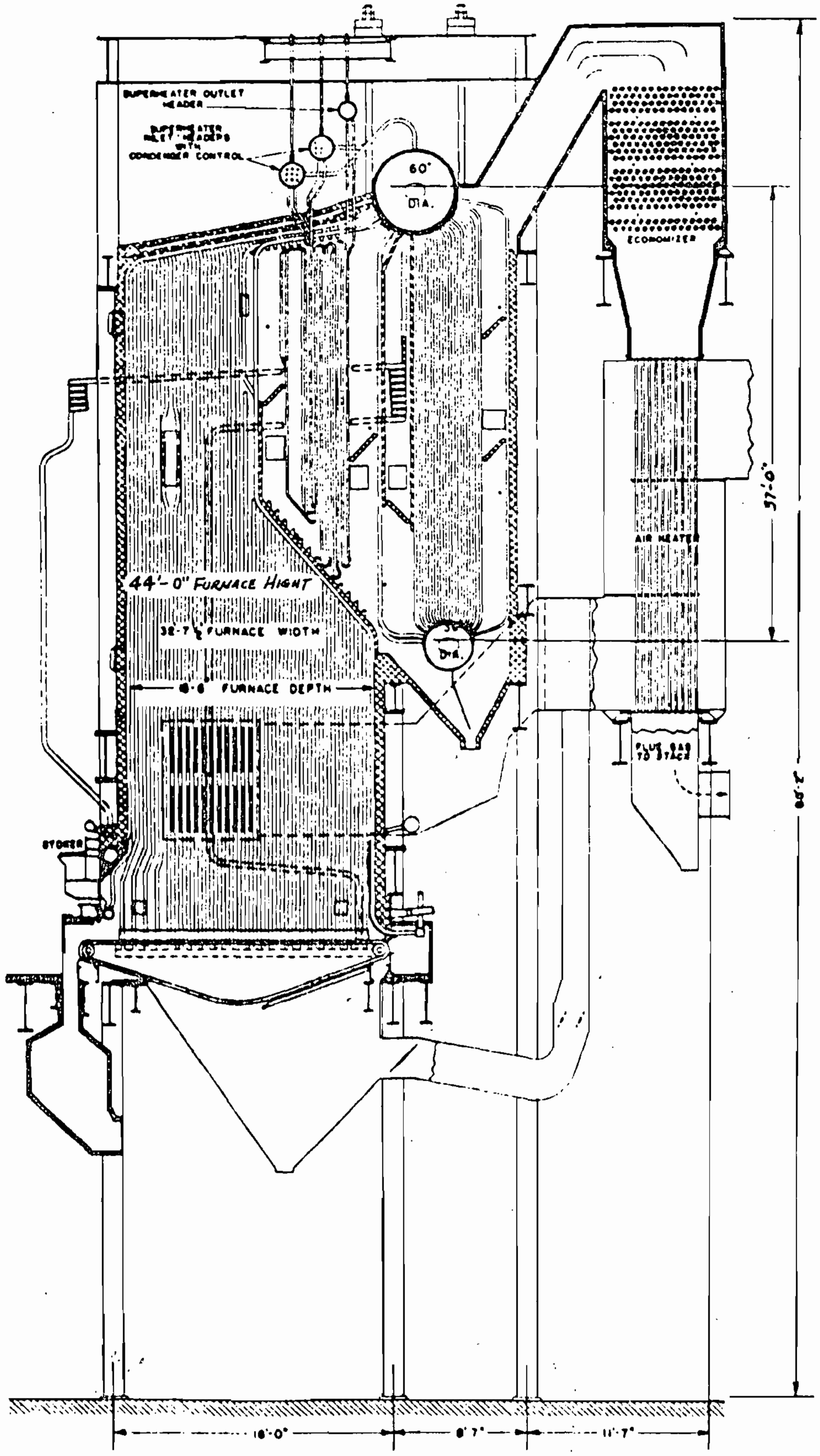
PROJECTED PERFORMANCE ON BAGASSE
FOR CONVERTED COAL FIRED FOSTER WHEELER BOILER

This boiler is similar in furnace design and overall configuration to the 250,000 T/Hr. No. 5 Boiler at the Bryant mill.

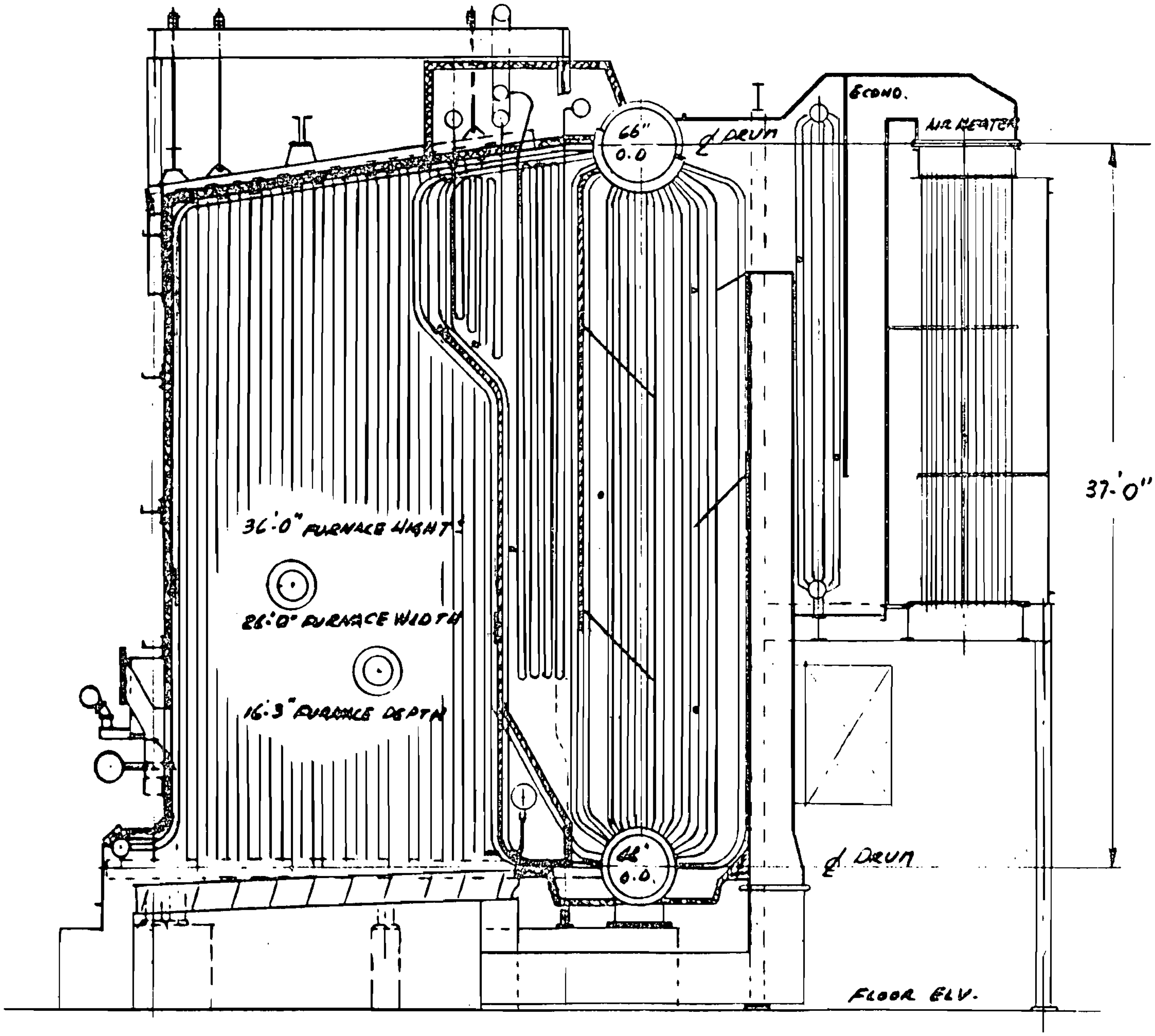
	Bryant #5 Boiler	Foster Wheeler Boiler
Boiler Bank H.S.- ft^2	28,150	24,635
Water Wall H.S.- ft^2	1,850	2,300
Superheater H.S.- ft^2	6,594	10,800
Overall Boiler H.S.- ft^2	36,594	37,735
Furnace Volume - ft^3	14,600	17,200
Grate Area - ft^2	406	506
Capacity - #/hr	250,000	Approx 250,000

Based on the above primary parameters and controlled as to capacity by the overall boiler heating surface the capacity of this boiler is expected to be similar to the No. 5 boiler at Bryant, or approximately 250,000 #/hr.

– CLEWISTON –
PROPOSED BOILER NO. 4



BRYANT BOILER NO. 5



250,000 #/hr. Bigelow Boiler

Best Available Copy

U. S. SUGAR CORPORATION, CLEWISTON, FLORIDA

BRYANT BOILER NO. 5

Item TYPE FUEL		Bagasse w/55% Moisture		
1. Output @ 900 Deg. F.T.T. Steam	Lbs./Hr.	100,000	200,000	150,000
2. Operating Pressure	Psig	875	875	875
3. Feed Water Temperature	Deg. F	250	250	250
4. Excess Air	%	35	35	35
5. CO_2	%	15.16	15.16	15.16
6. Boiler Draft Loss Incl. Suphtr.	"H2O		2.05	
7. Furnace Pressure	"H2O	0.20	0.20	0.20
8. Flue Gas Temperature Exit from Air P	Deg. F	400	400	400
9. Moisture in Steam	%	0.50	0.50	0.50
10. Temp. of Combustion Air	Deg. F.	415	450	430
11. Fuel Burned @ 3722 BTU/Lb	Lbs/Hr.	51,936	105,964	78,027
12. Efficiency	%	63.82	62.56	63.71
13. HEAT BALANCE				
14. Loss Due to Dry Gas	%	8.06	8.06	8.06
15. Loss Due to H2, Moist. in air & Fuel	%	24.98	24.98	24.98
16. " " "Carbon in Ash	%	1.00	2.50	1.25
17. " " " Radiation	%	0.64	0.40	0.50
18. " " " Unaccountables	%	1.50	1.50	1.50
19. Total Losses	%	36.18	37.44	36.29
20. MISCELLANEOUS DATA				
21. Input	M BTU/Hr	193,306	394,399	290,418
22. Output 1452.16 - 218.48 = 1233.68 BTU/# Stm	M Btu/Hr	123,368	246,736	185,052
23. Heat Release	BTU/CuFt.Hr			
24. Combustion Air @ 3.73#s/#Fuel	Lbs/Hr	193,721	395,246	291,011
25. " " @ 13.6 CuFt/#	CFM	43,910	89,589	65,969
26. Flue Gas 4.69#s/#Fuel	Lbs/Hr	243,580	496,971	365,947
27. " " Exit Temp. @23.01CuFt/#	CFM	81,234	190,589	122,043

Suggest plus 15% capacity and 32% static be added for fan ...

Best Available Copy

Foster Wheeler Boiler

COMBINED PERFORMANCE DATA

Data marked with an asterisk (*) furnished by ~~Bidder—Seller~~ Contractor

The predicted performance of the steam generating equipment in continuous commercial operation shall be as follows with guaranteed items marked with a cross (+):

Steam Generating Unit

Fuel burned	Coal	Coal	Coal	
Steam generated, M lb per hr -Continuous	150	225	300	
Working steam pressure at superheater outlet, psi gage	875	875	+875	
Working drum pressure, psi gage	* 880	* 885	* 894	*
Temperature, steam at ~~boiler~~ superheater outlet, F	* 870	900	+900	
~~Steam reheated, M lb per hr~~	-	-	-	
~~Working steam pressure at reheater outlet, psi gage~~	* -	* -	* -	*
~~Working steam pressure at reheater inlet, psi gage~~	-	-	-	
~~Temperature steam from reheater, F~~	* -	* -	* -	*
~~Temperature steam to reheater, F~~	-	-	-	
†Temperature feed water to unit, F	300	325	+3[illegible]0	
Fuel to ~~burners~~ stoker, M lb per hr	* 19.25	* 28.50	* [illegible]8.00	*
Excess air leaving, Economizer %	* 39	* 33	* 33	*
Overall efficiency of unit, %	* 85.89	* 85.[illegible]1	+* 84.17	*
Furnace heat release, M Btu per cu ft per hr	* 12.0	* 17.[illegible]	* 23.4	*
Flue gas from ~~unit~~ economizer, M lb per hr	* 232.0	* 331.0	* 434.0	*
†‡Flue gas from air heater, M lb per hr	* 232.0	* 331.0	* 434.0	*
Air to ~~burners~~ Plenum Chamber, M lb per hr at F	* 196.0 22[illegible] F	* 270.0 257 F	* 348.0 285 F	*
Air to ~~wind-box~~, % of total required for combustion	* 94%	* 9[illegible]%	* 9[illegible]%	*
†‡Air to air heater, M lb per hr at 60 F	* 202.9	* 285.3	* 375.7	*
Working water pressure at economizer inlet, psi gage	* -	* -	* [illegible]	*
CO_2 in flue gas at economizer exit, %	* 13.2	1[illegible].0	1[illegible].0	

Flue Gas, Draft (−), Pressure (+), In. of Water				
a. ~~At~~ In furnace ~~outlet~~	* -.10	* -.10	* -.10	*
b. ~~At reheater outlet~~	* -	* -	* -	*
c. At ~~superheater~~ boiler outlet	* -.75	* -1.41	* -2.33	*
d. At economizer outlet	* -1.53	* -2.01	* -5.03	*
e. At air preheater inlet	* -1.56	* -2.07	* -5.13	*
i. At air preheater ~~boiler~~ outlet	* -2.35	* -4.69	+* -7.88	*

†Temperatures stated are normal expected. Actual temperatures may be ±5 F than stated and subject to swings with changing loads.

††Leakage of regenerative type heaters, if used, included.

#Adjusted for condenser control

A 3031.1 (2-62)

Air Pressure, In. of Water				
a. In ~~wind box~~ plenum chamber	.73	1.38	2.40	
b. At air preheater outlet	.89	1.69	2.93	
c. At air preheater inlet	1.97	3.81	6.73	
d. ~~At steam-air heater inlet~~	–	–	–	
Supplementary Temperatures, F				
a. Feed water at economizer outlet	395	435	490	
Flue gas at:				
b. Furnace outlet	1,700	1,880	2,000	
c. Boiler superheater outlet	630	695	750	
d. Reheater outlet	–	–	–	
e. .... superheater outlet	–	–	–	
f. Economizer outlet	385	440	500	
g. Air preheater-boiler outlet††	245	280	320	
Air at:				
h. Steam-air heater inlet	–	–	–	
i. Air preheater inlet	60	60	60	
j. Air preheater outlet††	225	257	285	
~~Desuperheating — Attemperating Water~~				
a. ~~Required for superheater, lb per hr~~				
b. Based on water temperature, F				
c. Required for reheater, lb per hr				
d. ~~Based on water temperature, F~~				
~~Auxiliary Power Input~~				
a. ~~Recirculating pumps fans, kw~~				
Heat Balance††				
a. Dry gas loss, %	4.63	5.50	6.50	
b. Moisture in flue gas loss, %	5.83	5.92	6.04	
c. Unburned carbon loss, %	*1.15	1.25	1.30	
d. Radiation loss, %	1.00	.62	.49	
e. Unaccounted for loss, %	1.50	1.50	1.50	
f. Total losses, %	14.11	14.79	15.83	
Solids in steam with concentration of 1,250 ppm in boiler water and 100 ppm in feed water, ppm	1	1	1	
Moisture carryover, %	–	–	–	

††With leakage of regenerative type heaters, if used.

**By Detroit Stoker Co.

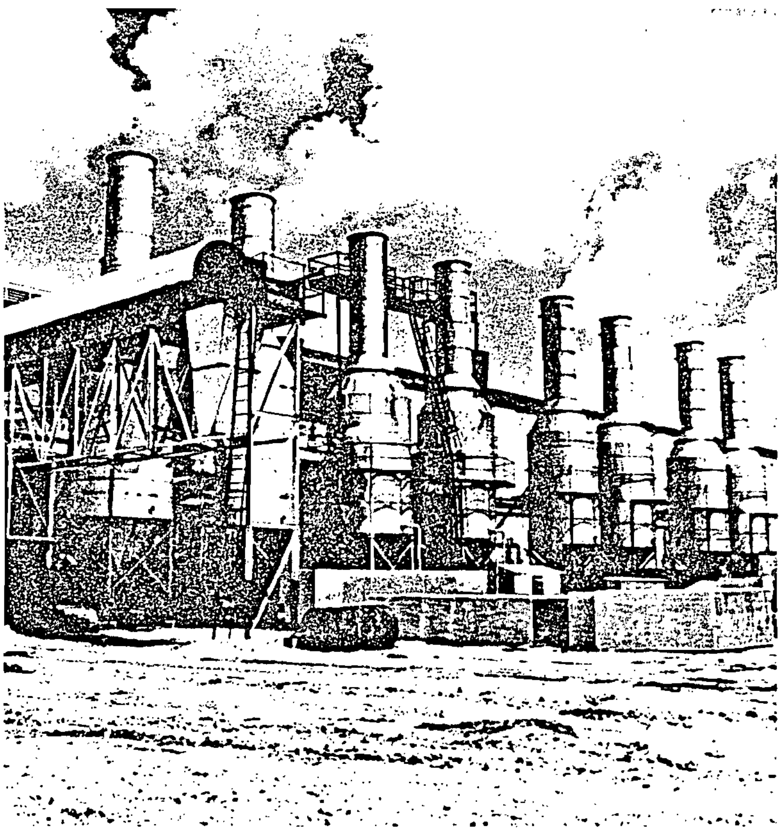
A 2031.1 (5-53)

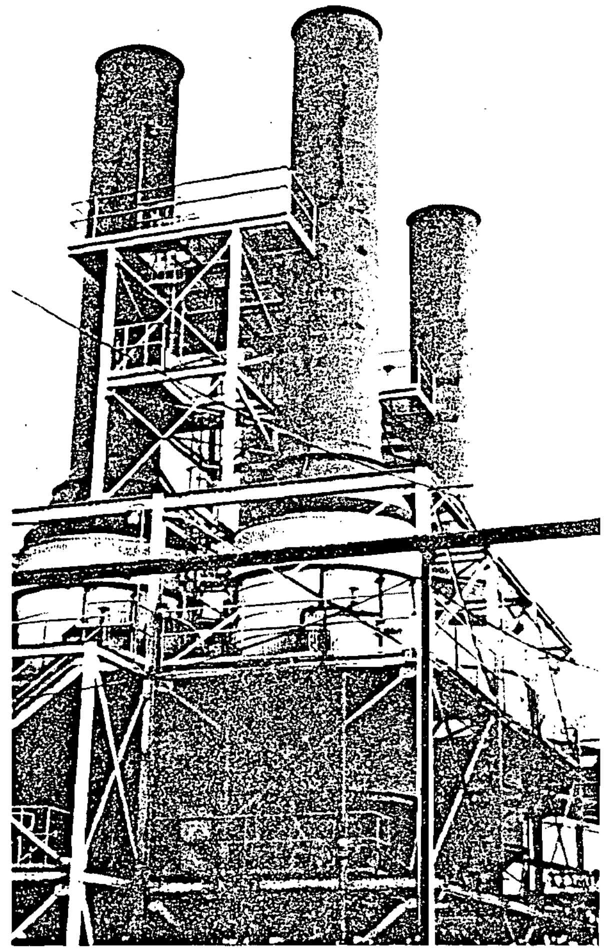
APPENDIX C

BOILER 4
SPRAY IMPINGEMENT SCRUBBER DESIGN DETAILS

Type "D" Turbulaire® Scrubber

High efficiency / low energy / non-plugging / for large volumes.





Type "D" Turbulaire® Scrubbers are used where dust particle sizing and process conditions require low energy inputs (Scrubber pressure drops less than 14 inches of water). These energy requirements are below the range in which the collecting mechanisms of conventional venturi scrubbers begin to take full effect. Hence, our Type "D" units often match the performance of venturi scrubbers while saving 20 to 50 percent in operating horsepower.

The Type "D" model has a vertical flow design which requires a minimum of floor space. The cylindrical configuration improves rigidity with light gage "unitized" construction.

Best Available Copy

How It works

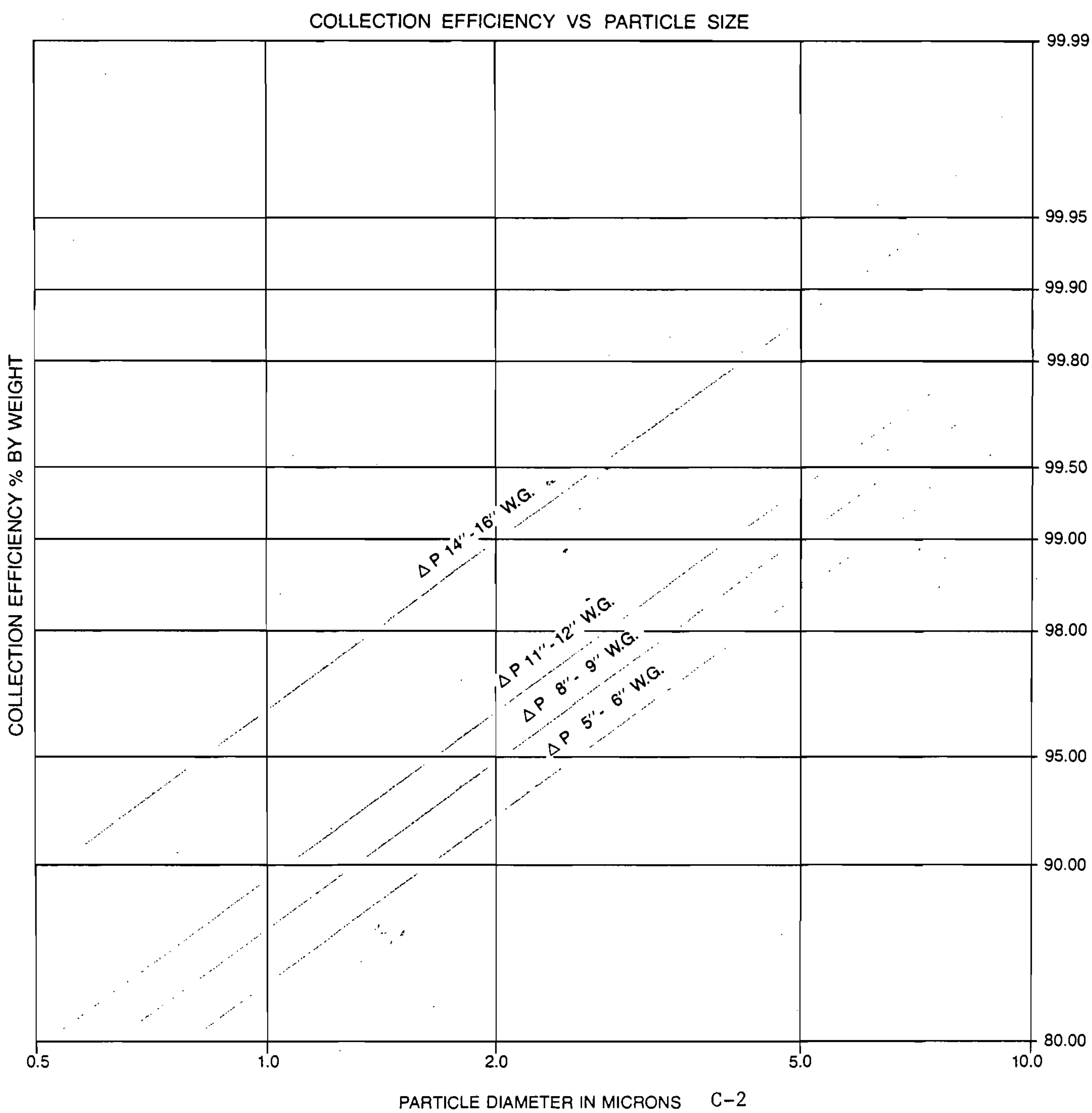
A patented peripheral gas nozzle (U.S. patent 3726513) combines a low energy venturi effect with collection by impingement on the liquid bath. This combination provides optimum energy utilization at low pressure drop.

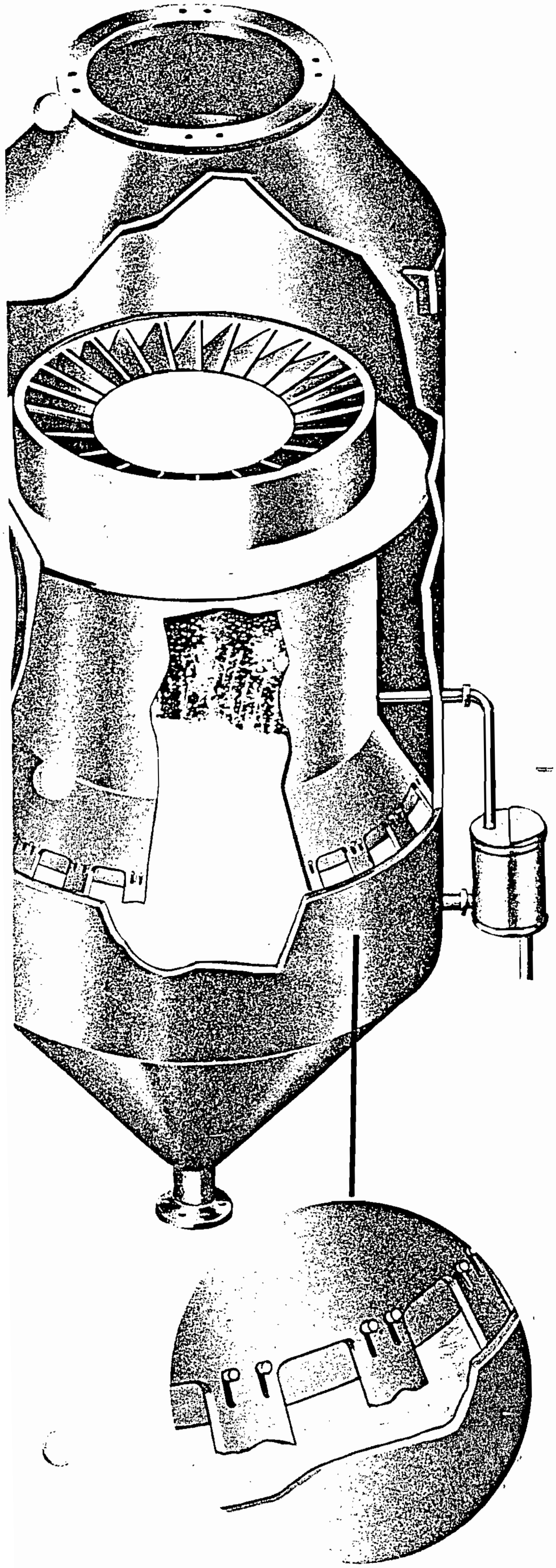
In order to accommodate changes in process conditions or more stringent emission codes, the unit is designed to allow for variations in pressure drop by means of a simple internal adjustment of the peripheral gas nozzle.

Slurries are kept in suspension in the sump by the action of the gases being scrubbed. Mist elimination is accomplished with the centrifugal action of a set of swirl vanes, and the droplets once separated from the gas stream are returned by gravity into the sump.

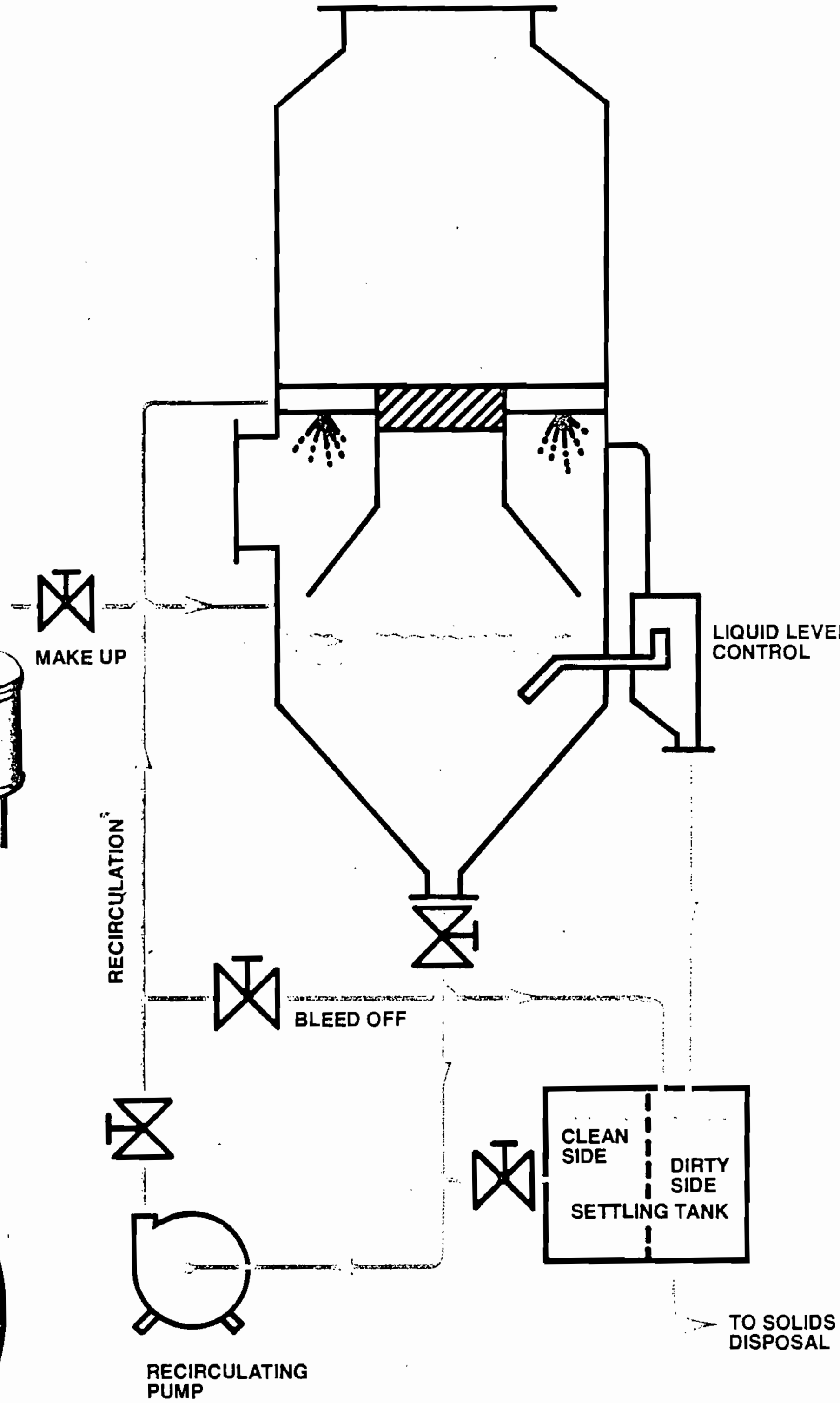
Water needs are kept to a minimum by the unit's ability to recirculate the heavily concentrated slurries often containing as much as 5.0% solids by weight. The top gas outlet configuration makes stack connection simple; the flanged slurry drain can be connected to settling tanks or piped for disposal with ease.

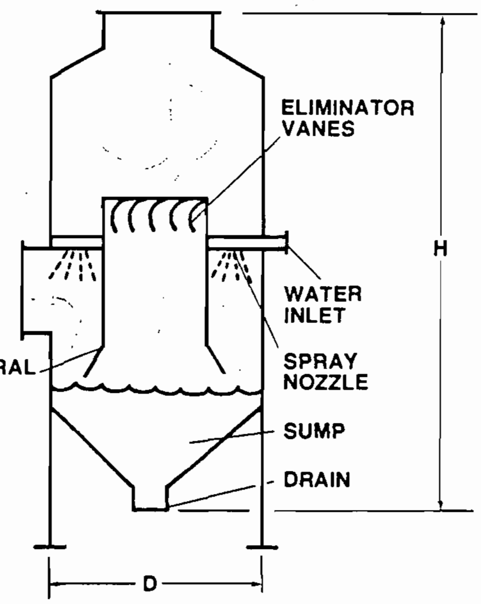
The Type "D" is simple, rugged, with no moving parts and excellent non-plugging characteristics, and it can be made of a variety of corrosion-resistant metals as well as lightweight, low cost fiberglass reinforced polyester (FRP).





Type "D" Process Flow Diagram





AVAILABLE OPTIONS

Support Assembly (Drain flange 2′-6″ to grade)
Discharge valve, Cast iron or Rubber lined
Automatic water supply control
Manometer and Fittings
Pump and Motor
Fan and Motor

EQUIPMENT SIZING

SCRUBBER SIZE	DESIGN ACFM OUTLET	DRAIN SIZE (IN)	SUMP CAPACITY (GAL)	DIAMETER D	HEIGHT H	INLET DIAMETER	OUTLET DIAMETER
4	6,900	3	157	4′-0″	10′-3″	1′-7″	2′-9″
4.5	8,700	3	208	4′-6″	11′-1″	1′-9″	3′-1″
5	10,700	3	269	5′-0″	12′-1″	2′-0″	3′-5″
5.5	13,000	3	340	5′-6″	13′-0″	2′-2′	3′-9″
6	15,500	3	423	6′-0″	13′-11″	2′-4″	4′-1″
6.5	18,200	3	517	6′-6″	14′-11″	2′-7″	4′-5″
7	21,100	3	624	7′-0″	15′-10″	2′-9″	4′-9″
7.5	24,300	4	744	7′-6″	16′-8″	2′-11″	5′-1″
8	27,600	4	877	8′-0″	17′-8″	3′-2″	5′-5″
8.5	31,100	4	1,026	8′-6″	18′-8″	3′-4″	5′-9″
9	34,900	4	1,189	9′-0″	19′-7″	3′-6″	6′-1″
9.5	38,900	4	1,370	9′-6″	20′-5″	3′-9″	6′-5″
10	43,100	4	1,566	10′-0″	21′-4″	3′-11″	6′-9″
10.5	47,600	4	1,781	10′-6″	22′-4″	4′-1″	7′-1″
11	52,200	6	2,014	11′-0″	23′-2″	4′-4″	7′-6″
11.5	57,100	6	2,266	11′-6″	24′-1″	4′-6″	7′-10″
12	62,200	6	2,537	12′-0″	25′-0″	4′-8″	8′-2″
12.5	67,400	6	2,830	12′-6″	26′-0″	4′-11″	8′-6″
13	72,900	6	3,144	13′-0″	26′-10″	5′-1″	8′-10″

EQUIPMENT SPECIFICATIONS

Scrubber of cylindrical shape shall be of the high efficiency inertial-orifice type with radial inlet. The gas to be cleaned passes through a peripheral nozzle and is jetted in a near vertical direction and at high velocity into a static liquid bath, the level of which is maintained slightly below the bottom of the gas nozzle by means of an adjustable weir. Weir box shall be equipped with a gas-lock release mechanism. After leaving liquid bath, gases shall pass through a centrifugal type spray eliminator and exit the scrubber through the top vertical discharge.

World-Wide Response/Ability

WESTERN PRECIPITATION DIVISION JOY™

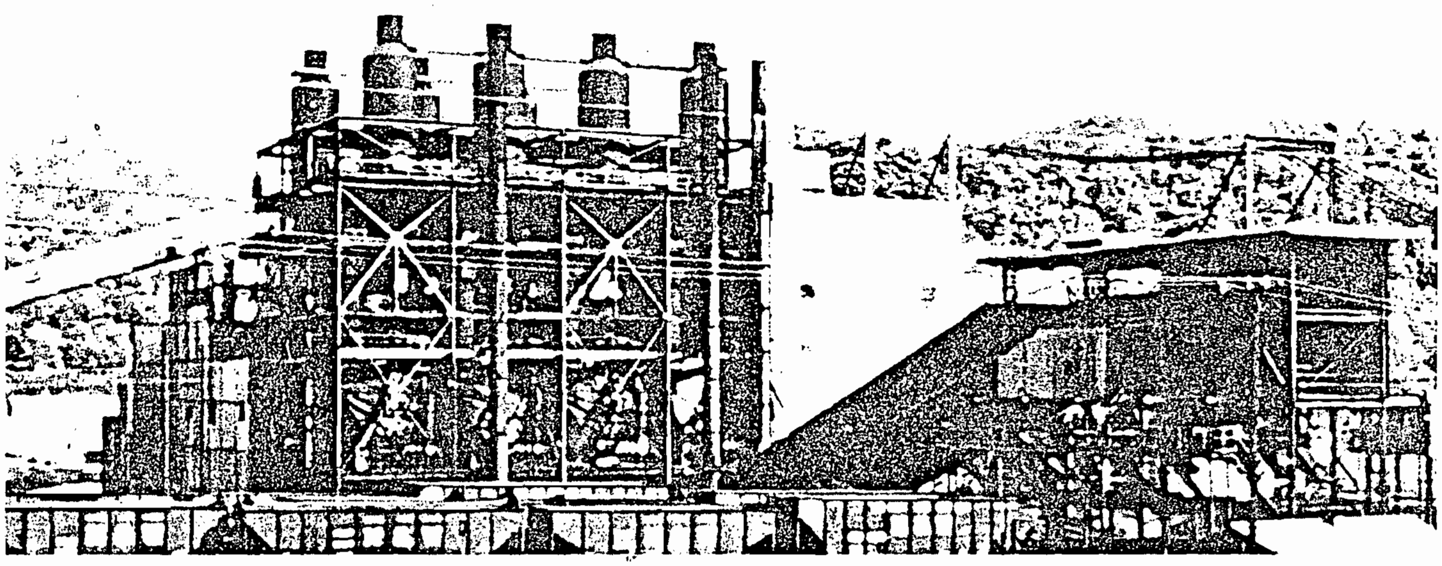
Joy Industrial Equipment Company
P.O. Box 2744, Terminal Annex
Los Angeles, California 90051
(213) 240-2300

Best Available Copy

Proven performance in a wide range of applications

Because we have pioneered the air pollution control field since 1907, we have within arm's reach more answers to your pollution control problems than anyone else. So no matter how peculiar your air pollution problem, our engineers will evaluate many workable solutions—and before they're through, they'll narrow all of the alternatives to the one solution that's best for your particular case.

"Turbulaire" scrubbers have been used successfully to control emissions from many industrial process operations, including combustion, chemical, mining, metallurgical, etc.



Some "Turbulaire®" features

Scrubbing slurry processing expenses (clarifiers, pumps, etc.) are kept down by making every drop count. Special sump designs maintain high turbulence within the scrubbing liquid. The high turbulence permits higher slurry concentrations reducing the possibilities of solid build-up or system stoppage. (Most of our units operate at liquid to gas ratios of less than 3GPM/1,000 ACFM.) Therefore less processing equipment is required.

Simple, compact designs save valuable in-plant space and make minimum operating and maintenance demands.

"Turbulaire" scrubbers are often used in conjunction with other collection equipment. Flexibility in space needs and efficiency make "Turbulaire" scrubbers excellent add-on units, especially for already tight plant layouts.

Each "Turbulaire" scrubber model can be adapted to meet virtually any corrosion problem. For example, units can be made of mild or stainless steel, FRP, or with corrosion resistant plastics, rubber, lead or acid brick liners.

BEST AVAILABLE COPY

Scrubber Application List by Industry

WP™ scrubbers have solved air pollution control problems in a wide variety of industries. If your particular application is included on our list below, chances are that we can help you.

ASPHALT
- Kiln (Batch Process)
- Kiln (Continuous Mix)

COAL
- Dryers
- Pulverizers
- Handling, Transfer Points
- Underground Ventilation

COMBUSTION PROCESSES
- Bagasse Boilers
- Bark and Wood Boilers
- Bagasse Residue Boilers
- Coal-fired Boilers
- Kraft Recovery Boilers
- Incinerators
- Oil-fired Boilers

FERTILIZERS
- Ammoniators
- Coolers
- Dryers
- Evaporators
- Prill Towers
- Product Handling and Ventilation
- Reactors and Granulators

INORGANIC CHEMICALS
- Coolers and Dryers
- Pyrites Roasting
- Sulphuric Acid Mist

IRON AND STEEL
- Blast Furnaces
- Coke Ovens
- Cupolas
- Crushing and Handling
- Electric Furnaces
- Foundry Clean-up
- Open Hearth Furnaces
- Taconite Nodulizing Furnaces
- Sintering Systems
- Ventilation Systems

MINING
- Ore Crushing and Handling
- Mine Ventilation
- Screening and Sizing

NON-FERROUS METALS
- Alumina Calcining
- Antimony Smelters
- Bauxite Dryers
- Chromium Smelters
- Copper Smelters
- Gold, Mercury Smelters
- Lead Smelters
- Magnesium Smelters
- Molybdenum Smelters
- Nickel Smelters
- Vanadium, Uranium Smelters
- Zinc Smelters

NON-METALLIC MINERALS
(Cement, Lime, Rock Products, etc.)
- Calciners
- Clean-up and Ventilation
- Clinker Coolers
- Dryers
- Kilns
- Preheaters
- Pulverizers

ORGANIC CHEMICALS
- Carbon Black
- Food, Glue, etc.
- Insecticides
- Paint and Resins
- Pharmaceuticals

ORGANIC CHEMICALS CONTINUED
- Plastics
- Sewage Sludge Dryers

PETROCHEMICALS
- Catalytic Cracking Regenerators
- Catalytic Cracking Reactors
- Fluidized Coke
- Shale Oil

PULP AND PAPER
- Kraft Recovery Boilers
- Magnesia Red Liquor Acid Recovery
- Magnesia Red Liquor—Dry Dust Collection
- Magnesium Oxide from Bi-Sulfite Recovery
- Dissolving Tank Ventilation
- Slaker Tank Ventilation

INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS

FOR

TURBULAIRE® SCRUBBER

TYPE D

JOY MANUFACTURING COMPANY
Western Precipitation Division
1000 W. Ninth St.
Los Angeles, California 90015

CONTENTS

FIGURES

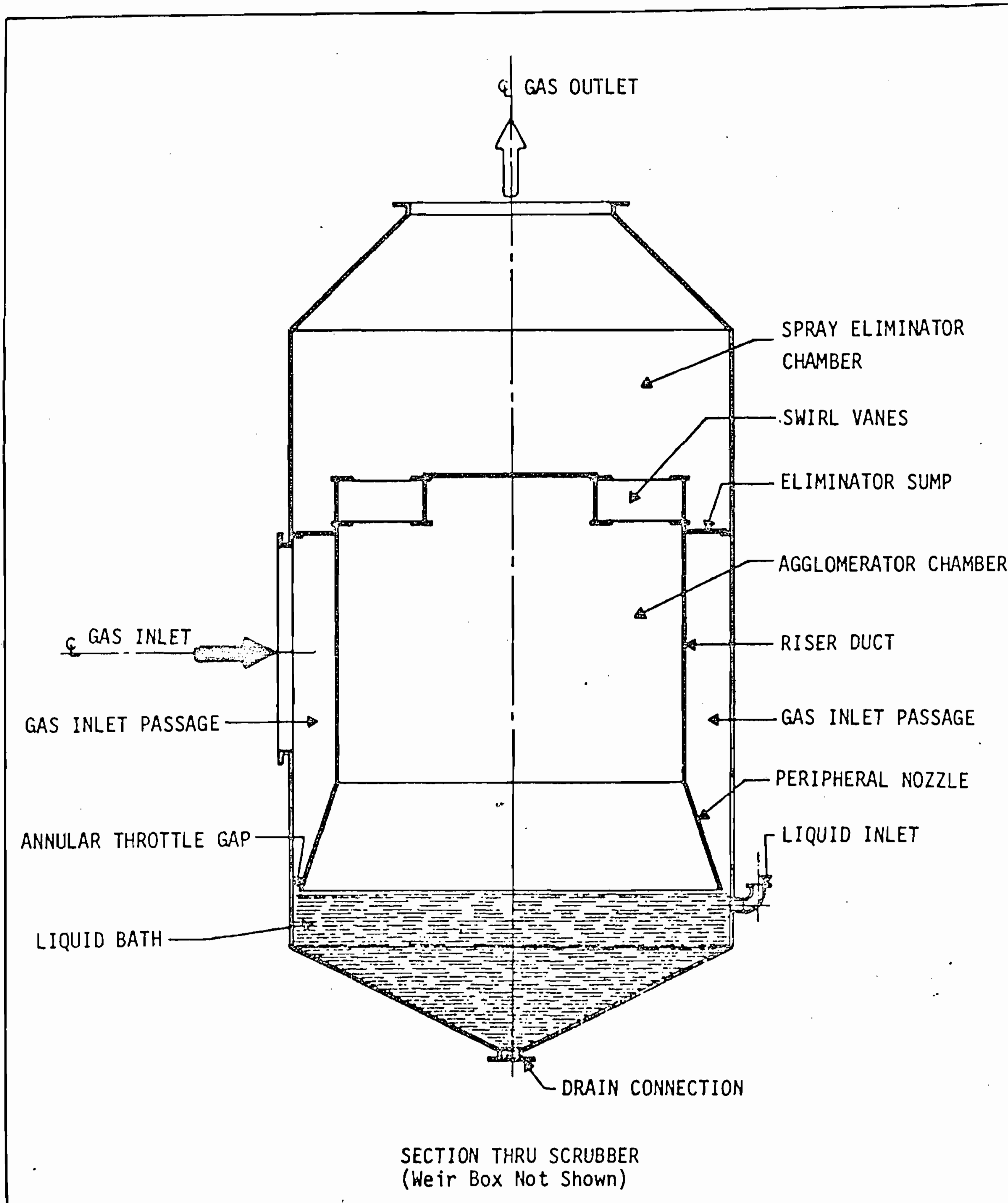


Figure 1. Turbulaire® Scrubber, Type D-B, Sizes 20 thru 64

DESCRIPTION

The Type D Turbulaire® Scrubber (Figure 1) consists of a vertical cylindrical shell with conical top and conical hopper on the lower end. The scrubber is divided into two chambers; the agglomerator chamber and the eliminator chamber.

The agglomerator chamber is in the lower portion of the scrubber and consists of the hopper with liquid bath, the gas inlet passage with conical throttle and the liquid level regulating assembly.

The eliminator chamber is above the agglomerator chamber and consists of a set of swirl vanes and a sump preceding the gas outlet.

TYPE & SIZE DESIGNATION

1 D B MS R 32

- 32 — Size
- R — Shell Lining if specified
- MS — Shell Material
- B — Hopper Type
- D — Design Type
- 1 — Number of Units

The scrubber has the gas inlet located radially on the side of the shell and the gas outlet at the top center. The agglomerator cylinder is surrounded by the gas inlet passage. The shell and the peripheral nozzle of the agglomerator chamber form an annular throttling gap at the bottom of the gas inlet passage. The normal operating level of the scrubbing liquid bath is just below the throttling gap.

Swirl vanes are mounted in the top of the agglomerator cylinder. A horizontal plate joining the agglomerator with the shell forms the eliminator sump. Weep holes drain the liquid from the eliminator sump into the scrubbing liquid bath in the hopper.

A liquid level regulating assembly is mounted on the lower exterior region of the shell. This assembly consists of a gas lock release pipe, weir box with liquid level control, and a seal pipe with overflow. The liquid inlet is located just above the hopper. Access doors are provided in the hopper and in the upper region of the shell.

Construction material for the standard scrubber is mild steel. Optional materials of construction may be: mild steel lined with rubber, lead or coated with epoxy resin; 304 or 306 stainless steel; and fiber reinforced polyester.

FIELD INSTALLATION

Field installation of the scrubber is as follows:

1. Set the unit on the foundation and attach the anchor bolts. Level unit by shimming between unit and foundaticn.

NOTE: Vertical and horizontal alignment of the scrubber is important to ensure an even circumferential dimension between the peripheral nozzle and quiescent liquid level.

2. Connect the inlet and outlet flues to the unit. It is recommended that inspection doors, adjacent to the scrubber, be included in the customer's flues.

NOTE: Dynamic and dead load forces from customer's fan, equipment and flues must not be transmitted to the scrubber equipment.

3. Attach the sight glass and weir box to the scrubber, then connect the seal pipe overflow to a drain line.

4. Connect the hopper outlet to a drain line. The drain line should contain a valve for flow balancing purposes.

PREPARATION OF THE SCRUBBER FOR OPERATION

The scrubber is designed to operate under the conditions in the operating data sheet in the front of the manual.

Prior to turning on the flue gas, liquid flow and liquid level should be established as follows:

1. Remove the weir box cover.

2. Turn on the liquid supply. By means of a flow meter or other measuring device, adjust the flow of the inlet liquid until the rate prescribed on the data sheet is attained.

3. Open the valve at the hopper outlet and establish a flow of liquid adequate to remove the slurry from the hopper.

4. Raise or lower the liquid level control as required until the liquid in the scrubber reaches and maintains a steady level, approximately 1/2-inch below the peripheral nozzle. This level is indicated by a red line painted on the weir box. Tighten the clamp which secures the level control in place.

NOTE: The liquid level control and liquid inlet rate may require adjustment to comply with rated pressure drop and outlet gas conditions.

5. Replace the weir box cover. The scrubber is now ready to receive flue gas.

If the tank is lined with lead, rubber, epoxy resins or other material which may deteriorate at high temperatures, the temperature of the inlet gas must be adjusted within limits compatible with these materials as noted after operating instruction.

OPERATION

Operation of the scrubber requires only that the fan be turned on to move flue gas through the scrubber.

As flue gas enters the scrubber through the inlet, its speed is increased to the desired operating velocity as it passes through the throttling gap. The dust-laden gas is then discharged at high velocity and penetrates deeply into the liquid bath wherein the dust combines with the liquid to form a slurry which is discharged through the hopper outlet valve. The turbulence resulting from the entrance of the high velocity gas into the scrubbing bath is sufficient to produce a dense spray. This spray is removed from the gas by the swirl vanes.

The scrubber should continue to operate at constant efficiency if the gas volume, temperature and dust load do not change. If there is an increase in the dust load, it may be necessary to increase the flow rate of the scrubbing liquid, in which case, the hopper outlet valve must be adjusted to maintain the operating liquid level. A decrease in the dust load will permit decreasing the scrubbing liquid flow rate.

The efficiency of the unit may be increased by: increasing pressure drop through unit, cooling inlet gases if necessary, and increasing the inlet liquid rate, described as follows:

1. Increase pressure drop through the unit by restricting the nozzle opening or by increasing the gas flow through the unit.

The nozzle opening can be restricted by adding material to the nozzle opening and thus cut down the size of the opening. The opening is designed so that at the gas density and volume specified, the required pressure drop should be obtained. Sometimes the gas density or the volume are not that which is calculated and, if the pressure drop is low, it is necessary to close down on the opening. This is fairly easily accomplished and, by doing this, the velocity of the jet is increased into the liquid pool and, therefore, increases the efficiency of the unit.

The volume of air should never exceed the maximum allowable outlet gas volume as specified on the data sheet. This maximum volume cannot be exceeded without entraining some of the scrubbing liquid, and carrying it into the outlet flue.

Gas flow through the unit can be increased by opening the fan dampers or by introducing infiltration air into the flue through a damper.

If the scrubber is operating well below the maximum outlet gas volume, the simplest way to increase the pressure drop through the unit is to increase the fan delivery until the design pressure drop is reached.

2. <u>Introduce liquid sprays ahead of the scrubber inlet to humidify the gases entering the scrubber</u>. This system is employed whenever inlet gas temperatures are high enough to damage the lining of the shell. Changing the specified water flow to the spray nozzles is not recommended since this will change inlet gas density beyond scrubber design limits.

3. <u>Increase the inlet liquid rate</u>. This will also bring the temperatures of the gas down to saturation quickly. However, as the liquid rate is increased, the liquid level control will have to be reset until equilibrium conditions are maintained without gas passing through the unit. Increase of the liquid rate will give lower outlet gas temperatures and also lower outlet liquid temperatures.

MAINTENANCE

Although the scrubber should operate continuously with minimum maintenance some may be required. This includes: removing any build-up of dust on the peripheral nozzle which would impair operation, and periodically cleaning out the scrubber and liquid seal pipe to prevent clogging of the outlet.

In addition, situations may be encountered which may impair the operation of the scrubber:

1. Plugging of the Overflow Pipe
   Occasionally on some dusts (generally those associated with fluorides), there may be some plugging of the overflow pipe which leads from the scrubber to the weir box. This plugging is due to settling out or deposition of particles in the pipe and can generally be relieved by one or two methods.

   One method is to periodically clean out the pipe with a reamer or a scraper of some sort. For those scrubbers with rubber, lead, or plastic lining, care should be taken that the lining is not pierced.

   Another method is to increase the velocity of liquid through the pipe by closing down on the cross sectional area. This is accomplished by laying pieces of tubing in the overflow pipe and building up enough tubing so that the cross sectional area of the pipe is gradually reduced. The velocity of liquid for materials which tend to settle out should be a minimum of 2 to 3 fps or higher.

2. Cold Weather Operation
   During periods of cold weather, care must be taken to prevent freezing of the liquid in the scrubber and in the supply lines. It may be necessary to insulate one or both. During periods of shutdown, the scrubber and liquid lines should be drained unless some method is employed to keep temperatures above the freezing point.

AUTOMATIC CONTROL RECOMMENDATION

An automatic liquid level control system is available as an optional extra from Western Precipitation Division.

The system consists of the following components:

a. Displacer type level control unit (Magnetrol)

b. Solenoid valve

c. Strainer

d. Piping and pipe fittings as required for field assembly.

The system is normally shipped loose for field assembly by the customer. Hook-up connections are provided on the hopper and the scrubber body.

OPERATION

The liquid level control unit uses a solid block displacer - heavier than the liquid - which is suspended from a helical spring. A rising liquid level imparts buoyancy to the displacer, lessening the load on the spring, thus, the displacer moves upward. A magnetic sleeve connected to the displacer also moves upward inside a non-magnetic enclosing tube, attracting a permanent magnet attached to a mercury switch (or pneumatic pilot valve). This actuates and closes the solenoid valve, and make-up water to the scrubber is shut-down. As the liquid level recedes, the magnetic sleeve and displacer drops allowing the magnet and switch element to return to the normal operating level. This actuates and opens the solenoid valve allowing flow of makeup water to the scrubber.

Thus, there is no possibility of excessive high or low liquid levels in the scrubber.

A cross is provided in the line to allow periodic flushing and cleanout of the system.

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ATTACHMENT TO QUESTION 20

WESTERN PRECIPITATION DIVISION
JOY MANUFACTURING COMPANY
4565 COLORADO BOULEVARD
LOS ANGELES, CALIFORNIA 90039
Phone: (213) 240-2300

February 8, 1974

Florida Sugar Cane League, Inc.
P.O. Box 1148
Clewiston, Florida 33440

Attention: Mr. J. Nelson Fairbanks
Vice President & General Manager

Gentlemen:

Confirming our conversations of January 30, 1974, we wish to present, herewith, the guarantees we are prepared to make to any member of the Sugar Cane League on the performance of our Type D "TURBULAIRE" Scrubber when used in conjunction with bagasse fired boilers.

With an inlet loading to the scrubber of 1 gr/dry standard CFM (DSCFM), we will guarantee a particulate outlet not to exceed .05 gr/DSCFM. If the condensables are to be included with particulate emission, we will then guarantee an outlet not to exceed .06 gr/DSCFM. These guarantees are based on operating the equipment at a pressure drop across the unit of not less than 5" water column (w.c.) and not more than 9" w.c. In addition, these guarantees are based on sampling with the EPA Train, Method 5, described in the Federal Register, Volume 36, No. 247, Thursday, December 23, 1971, copy enclosed.

The aforementioned guarantees are made on our equipment as originally designed or as modified with our approval. Any unauthorized modifications will abrogate these guarantees.

Very truly yours,

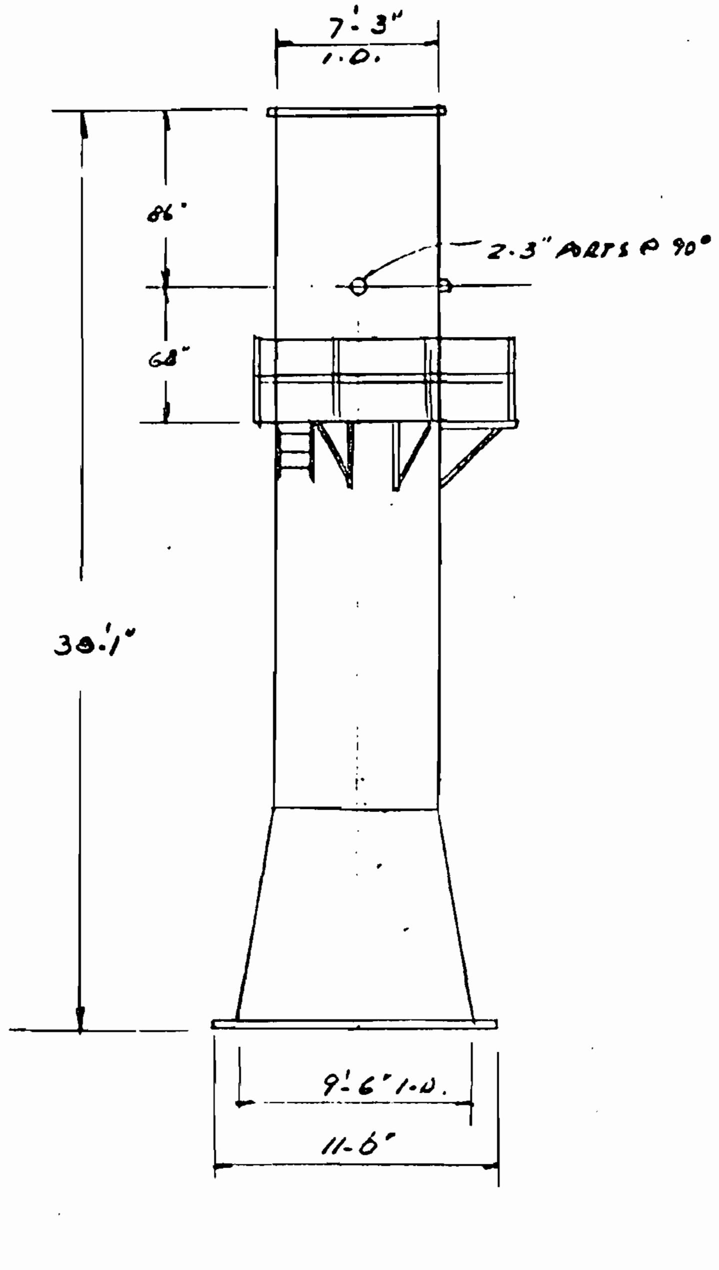
Allen H. Jones
Vice President, Standard Products

AHJ:js

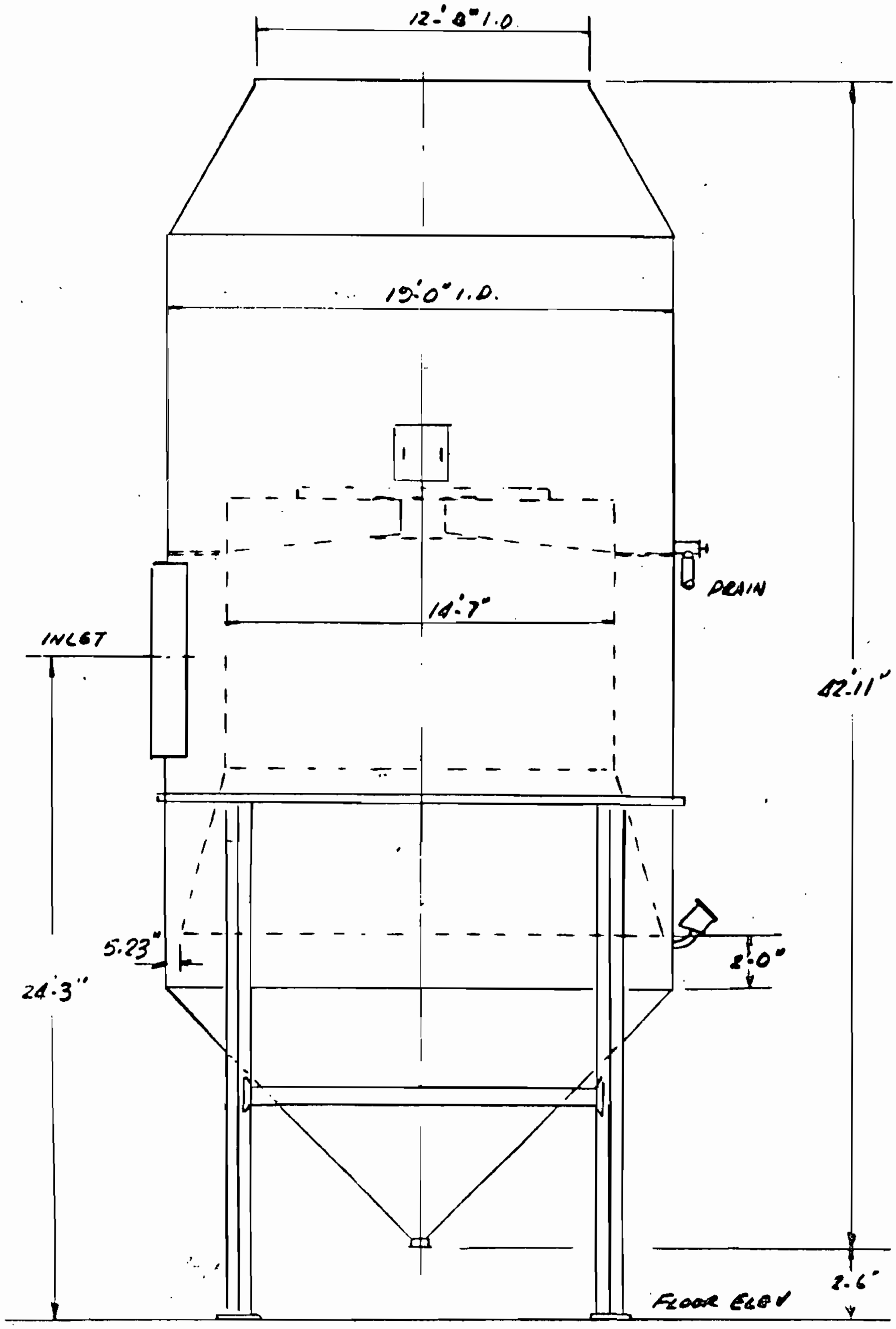
Encl. EPA Train, Method 5.

cc: F. Arroyo - Arroyo Process Equipment
cc: L. Newton - Western Precipitation
cc: R. Fernandez - Western Precipitation

STACK BOILER No 4



SCRUBBER BOILER NO 4
SIZE D-150



APPENDIX D

COMPILATION OF PARTICULATE EMISSION TESTS
U. S. SUGAR CORPORATION, CLEWISTON MILL AND BRYANT 5

COMPILATION OF PARTICULATE EMISSION TESTS
U.S. Sugar Corporation, Clewiston Mill and Bryant 5

Test Number	Date	Steam Production (lb/hr)	Heat Input (10^6 Btu/hr) Bagasse	Heat Input (10^6 Btu/hr) Oil	Particulate Emissions ($lb/10^6$ Btu) Actual (Avg.)†	Particulate Emissions ($lb/10^6$ Btu) Allowable	Particulate Emissions (lb/hr) Actual	Particulate Emissions (lb/hr) Allowable	Actual Flow Rate (ACFM)	Stack Temperature (°F)
					CLEWISTON BOILER 1					
1	11/16/76	186,600	367.1	0	0.166	0.3	60.9	110.1		
2	11/16/76	179,000	352.1	0	0.164 (0.166)	0.3	57.8	105.6		
3	11/16/76	179,200	318.3	35.1	0.168	0.28	59.3	99.0		
4	02/09/78	206,100	408.6	0	0.131	0.3	53.7	122.6		
5	02/13/78	197,200	378.3	10.4	0.151 (0.145)	0.3	58.8	114.5		
6	02/13/78	218,000	425.7	0	0.152	0.3	64.6	127.7		
7	01/05/79	213,100	412.9	0	0.149	0.3	61.7	123.9		
8	01/05/79	205,200	395.0	0	0.168 (0.164)	0.3	66.4	118.5		
9	01/05/79	209,300	394.4	0	0.176	0.3	69.5	119.8		
10	12/03/79	210,201	404.3	0	0.173	0.3	70.1	121.3		
11	12/03/79	222,928	405.3	0	0.192 (0.197)	0.3	77.7	121.6		
12	12/03/79	225,000	409.1	0	0.225	0.3	92.1	122.7		
13	12/20/80	223,228	432.3	0	0.179	0.3	77.5	129.7	135,805	159
14	12/20/80	221,564	422.4	0	0.156 (0.165)	0.3	66.0	126.7	129,154	160
15	12/20/80	223,977	427.2	0	0.160	0.3	68.2	128.2	140,192	160
16	11/19/81	210,750	393.6	0	0.253	0.3	99.5	118.1	139,301	161
17	11/20/81	218,892	421.6	0	0.164 (0.222)	0.3	69.2	126.5	146,264	157
18	11/20/81	220,729	428.5	0	0.250	0.3	106.9	128.6	137,885	165
19	11/15/82	236,250	462.3	0	0.199	0.3	91.9	138.7	147,022	162
20	11/15/82	220,798	393.9	0	0.220 (0.203)	0.3	86.8	118.2	141,764	158
21	11/15/82	210,375	412.7	0	0.191	0.3	79.0	123.8	145,712	160

COMPILATION OF PARTICULATE EMISSION TESTS
U.S. Sugar Corporation, Clewiston Mill and Bryant 5
(Continued, Page 2 of 6)

Test Number	Date	Steam Production (lb/hr)	Heat Input (10^6 Btu/hr) Bagasse	Oil	Particulate Emissions ($lb/10^6$ Btu) Actual (Avg.)†	Allowable	(lb/hr) Actual	Allowable	Actual Flow Rate (ACFM)	Stack Temperature (°F)
					CLEWISTON BOILER 2					
1	11/10/75	175,000	314.2	33.3	0.147	0.28	52.1	97.6		
2	11/10/75	175,000	303.4	50.8	0.146 (0.156)	0.27	51.8	96.1		
3	11/10/75	175,000	315.9	49.3	0.175	0.27	63.8	99.7		
4	01/04/77	185,780	343.6	50.0	0.202	0.28	79.6	108.1		
5	01/04/77	186,876	358.3	18.0	0.165 (0.180)	0.29	62.0	109.3		
6	01/05/77	174,558	328.9	14.9	0.172	0.29	59.0	100.2		
7	02/08/78	198,200	361.0	0	0.123	0.3	44.4	108.3		
8	02/08/78	206,300	379.5	0	0.127 (0.143)	0.3	48.3	113.9		
9	02/08/78	211,000	388.8	0	0.180	0.3	70.1	116.6		
10	01/15/79	209,400	401.6	0	0.213	0.3	85.5	120.5		
11	01/15/79	215,100	410.4	0	0.129 (0.192)	0.3	52.9	123.1		
12	01/15/79	183,800	351.1	0	0.234	0.3	82.3	105.3		
13	12/04/79	203,450	370.0	0	0.198	0.3	73.2	111.0		
14	12/04/79	201,159	376.5	0	0.202 (0.192)	0.3	76.1	113.0		
15	12/04/79	207,360	377.0	0	0.175	0.3	65.8	113.1		
16	12/22/80	199,452	361.2	0	0.147	0.3	53.3	108.4	137,360	159
17	12/22/80	204,750	371.6	0	0.118 (0.151)	0.3	43.8	111.5	142,915	157
18	12/22/80	203,067	368.3	0	0.188	0.3	69.3	110.5	141,986	161
19	02/11/82	208,319	369.0	62.8	0.144	0.27	62.0	117.0	158,489	157
20	02/11/82	204,750	380.6	42.8	0.156 (0.136)	0.28	66.1	118.4	155,621	155
21	02/11/82	212,318	384.3	40.5	0.107	0.28	41.1	119.3	152,127	156
22	11/17/82	203,097	416.2	0	0.189	0.3	78.8	124.9	153,869	162
23	11/17/82	204,750	423.2	0	0.139 (0.165)	0.3	58.8	127.0	153,891	163
24	11/17/82	214,817	453.2	0	0.167	0.3	75.9	136.0	149,671	158

COMPILATION OF PARTICULATE EMISSION TESTS
U.S. Sugar Corporation, Clewiston Mill and Bryant 5
(Continued, Page 3 of 6)

Test Number	Date	Steam Production (lb/hr)	Heat Input (10^6 Btu/hr) Bagasse	Heat Input (10^6 Btu/hr) Oil	Particulate Emissions ($lb/10^6$ Btu) Actual (Avg.)†	Particulate Emissions ($lb/10^6$ Btu) Allowable	Particulate Emissions (lb/hr) Actual	Particulate Emissions (lb/hr) Allowable	Actual Flow Rate (ACFM)	Stack Temperature (°F)
					CLEWISTON BOILER 3					
1	11/12/75	100,000	146.2	47.4	0.114	0.25	21.6	48.6		
2	11/12/75	100,000	123.5	77.5	0.134 (0.185)	0.22	27.0	44.8		
3	11/12/75	100,000	135.1	61.7	0.306	0.24	60.3	46.7		
4	11/19/76	87,600	145.3	24.7	0.144	0.27	24.5	46.1		
5	11/19/76	88,200	146.6	25.6	0.156 (0.153)	0.27	26.8	46.5		
6	11/19/76	81,000	130.7	21.2	0.158	0.27	24.0	41.3		
7	02/14/78	82,600	160.5	0	0.122	0.3	19.6	48.2		
8	02/14/78	82,500	160.5	0	0.149 (0.140)	0.3	23.9	48.2		
9	02/14/78	81,800	155.2	2.5	0.150	0.3	23.7	46.8		
10	12/18/78	111,800	125.8	102.8	0.107	0.21	24.5	48.0		
11	12/19/78	107,500	168.5	42.2	0.105 (0.118)	0.26	22.1	54.8		
12	12/19/78	105,600	148.4	63.5	0.142	0.24	30.0	50.9		
13	12/12/79	90,426	186.4	0	0.260	0.3	48.4	55.9		
14	12/12/79	91,969	189.4	0	0.264 (0.248)	0.3	50.0	56.8		
15	12/12/79	93,462	183.8	8.9	0.219	0.29	42.2	56.0		
16	12/23/80	107,693	203.1	18.9	0.127	0.28	28.5	62.8	81,798	159
17	12/23/80	107,432	206.8	14.6	0.118 (0.123)	0.28	26.5	63.5	83,018	161
18	12/23/80	107,156	199.2	21.7	0.123	0.27	28.0	61.9	78,292	158
19	11/23/81	110,455	205.9	5.6	0.222	0.3	47.0	62.3	89,348	151
20	11/23/81	109,929	190.6	2.0	0.218 (0.204)	0.3	41.9	57.4	77,278	152
21	11/23/81	117,149	201.4	3.9	0.172	0.3	35.4	60.8	87,779	153
22	11/16/82	177,900	246.9	0	0.181	0.3	44.6	74.1	95,944	156
23	11/17/82	125,337	268.1	0	0.163 (0.170)	0.3	43.8	80.4	104,168	154
24	11/17/82	128,483	275.0	0	0.167	0.3	46.0	82.5	101,931	156

COMPILATION OF PARTICULATE EMISSION TESTS
U.S. Sugar Corporation, Clewiston Mill and Bryant 5
(Continued, Page 4 of 6)

Test Number	Date	Steam Production (lb/hr)	Heat Input (10^6 Btu/hr) Bagasse	Heat Input (10^6 Btu/hr) Oil	Particulate Emissions ($lb/10^6$ Btu) Actual (Avg.)†	Particulate Emissions ($lb/10^6$ Btu) Allowable	Particulate Emissions (lb/hr) Actual	Particulate Emissions (lb/hr) Allowable	Actual Flow Rate (ACFM)	Stack Temperature (°F)
					CLEWISTON BOILER 5					
1	01/04/78	60,000	119.6	0	0.244	0.3	29.2	35.9		
2	01/04/78	59,016	118.2	0	0.256 (0.256)	0.3	29.5	35.5		
3	01/04/78	54,104	108.2	0	0.267	0.3	28.9	32.5		
4	12/05/79	65,000	122.1	0	0.246	0.3	30.0	36.6		
5	12/05/79	65,000	122.2	0	0.234 (0.269)	0.3	28.6	36.7		
6	12/05/79	60,000	112.9	0	0.328	0.3	37.0	33.9		
7	01/13/81	64,565	124.6	0	0.275	0.3	34.3	37.4	63,836	153
8	01/13/81	70,667	136.0	0	0.183 (0.238)	0.3	24.9	40.8	63,620	152
9	01/13/81	66,353	128.0	0	0.257	0.3	32.9	38.4	61,850	155
10	11/24/81	61,177	122.1	0	0.247	0.3	30.2	36.6	54,677	151
11	11/24/81	65,934	131.6	0	0.288 (0.244)	0.3	37.9	39.5	55,780	153
12	11/24/81	65,161	129.7	0	0.197	0.3	25.6	38.9	56,671	149
13	11/18/82	51,724	102.4	0	0.207	0.3	21.2	30.7	58,290	139
14	11/18/82	60,000	117.7	0	0.154 (0.179)	0.3	18.1	35.3	56,200	141
15	11/18/82	54,838	108.8	0	0.175	0.3	19.0	32.6	57,640	142

COMPILATION OF PARTICULATE EMISSION TESTS
U.S. Sugar Corporation, Clewiston Mill and Bryant 5
(Continued, Page 5 of 6)

Test Number	Date	Steam Production (lb/hr)	Heat Input (10^6 Btu/hr) Bagasse	Oil	Particulate Emissions ($lb/10^6$ Btu) Actual (Avg.)†	Allowable	(lb/hr) Actual	Allowable	Actual Flow Rate (ACFM)	Stack Temperature (°F)
					CLEWISTON BOILER 6					
1	02/19/76	57,400	118.7	0	0.164	0.3	19.5	35.6		
2	02/19/76	57,000	117.7	0	0.177 (0.161)	0.3	20.8	35.3		
3	02/20/76	60,000	124.0	0	0.141	0.3	17.5	37.2		
4	01/13/77	50,026	100.1	0	0.262	0.3	26.3	30.0		
5	01/13/77	49,773	99.5	0	0.287 (0.270)	0.3	28.5	29.9		
6	01/13/77	51,906	103.1	0	0.262	0.3	27.0	30.9		
7	01/05/78	59,381	118.7	0	0.217	0.3	25.7	35.6		
8	01/05/78	59,558	119.1	0	0.250 (0.256)	0.3	29.8	35.7		
9	01/05/78	60,000	119.1	0	0.302	0.3	36.3	36.0		
10	03/13/79	61,026	116.6	0	0.327	0.3	38.1	35.0		
11	03/13/79	60,000	111.9	0	0.288 (0.284)	0.3	32.2	33.6		
12	03/13/79	62,376	116.3	0	0.236	0.3	27.5	34.9		
13	12/13/79	55,579	104.4	0	0.325	0.3	33.9	31.3		
14	12/13/79	55,385	104.0	0	0.263 (0.299)	0.3	27.3	31.2		
15	12/13/79	49,756	93.5	0	0.310	0.3	29.0	28.1		
16	01/03/81	60,571	113.4	0	0.261	0.3	29.6	34.0	64,344	161
17	01/03/81	66,976	126.5	0	0.243 (0.290)	0.3	30.7	38.0	60,370	164
18	01/03/81	63,750	119.9	0	0.366	0.3	44.0	36.0	65,866	167
19	11/24/81	54,495	107.6	0	0.214	0.3	23.0	32.3	45,666	143
20	11/24/81	53,394	105.9	0	0.257 (0.221)	0.3	27.2	31.8	44,806	145
21	11/24/81	65,106	129.0	0	0.192	0.3	24.8	38.7	49,757	148
22	01/15/83	60,674	118.1	0	0.184	0.3	21.7	35.4	60,403	145
23	01/15/83	70,588	138.1	0	0.208 (0.218)	0.3	28.7	41.4	61,294	149
24	01/15/83	68,764	134.5	0	0.261	0.3	35.1	40.4	61,177	150

COMPILATION OF PARTICULATE EMISSION TESTS
U.S. Sugar Corporation, Clewiston Mill and Bryant 5
(Continued, Page 6 of 6)

Test Number	Date	Steam Production (lb/hr)	Heat Input (10^6 Btu/hr) Bagasse	Heat Input (10^6 Btu/hr) Oil	Particulate Emissions ($lb/10^6$ Btu) Actual (Avg.)†	Particulate Emissions ($lb/10^6$ Btu) Allowable	Particulate Emissions (lb/hr) Actual	Particulate Emissions (lb/hr) Allowable	Actual Flow Rate (ACFM)	Stack Temperature (°F)
					BRYANT BOILER 5*					
1	03/06/81	169,898	387.6	0	0.098	0.15	38.03	58.1	180,907	153
2	03/06/81	167,368	381.0	0	0.090 (0.093)	0.15	34.34	57.2	179,213	153
3	03/06/81	172,959	393.4	0	0.090	0.15	35.35	59.0	177,161	152
4	02/15/82	202,000	459.3	0	0.110	0.15	50.59	68.9	165,783	153
5	02/15/82	190,116	430.6	0	0.158 (0.145)	0.15	68.21	64.6	168,560	152
6	02/15/82	193,125	434.9	0	0.167	0.15	72.59	65.2	165,557	154
7	03/04/83	187,037	409.5	0	0.148	0.15	60.78	61.4	166,329	154
8	03/04/83	185,625	404.8	0	0.144 (0.154)	0.15	58.48	60.7	168,412	152
9	03/04/83	185,625	404.8	0	0.169	0.15	68.39	60.7	170,018	151

* Last three compliance tests only.
† Compliance test results, i.e., average of three test runs.

U.S. Sugar Corporation, Bryant 5
Additional Test Results

Test Number	Date	Steam Production (lb/hr)	Heat Input (10^6 Btu/hr) Bagasse	Heat Input (10^6 Btu/hr) Oil	Particulate Emissions ($lb/10^6$ Btu) Actual	(Avg.)*	Allowable	Particulate Emissions (lb/hr) Actual	Allowable
1	02/27/80	117,857	255.8	0	0.151		0.15	38.6	38.4
2	02/27/80	106,250	236.2	0	0.415	(0.225)	0.15	98.1	35.4
3	02/27/80	118,605	265.0	0	0.110		0.15	29.1	39.8
4	02/27/80	135,000	300.4	0	0.096		0.15	28.7	45.1
5	02/27/80	157,143	354.4	0	0.056	(0.080)	0.15	19.7	53.2
6	02/27/80	156,977	356.0	0	0.087		0.15	31.0	53.4
7	02/29/80	165,789	368.9	0	0.158		0.15	58.4	55.3
8	02/29/80	155,405	345.0	0	0.128	(0.141)	0.15	44.3	51.8
9	02/29/80	169,068	377.2	0	0.136		0.15	51.4	56.6
10	03/02/81	167,797	376.8	0	0.153		0.15	57.6	56.5
11	03/02/81	161,111	361.8	0	0.200	(0.181)	0.15	72.4	54.3
12	03/02/81	169,091	379.7	0	0.190		0.15	72.0	57.0
13	12/14/81	200,893	441.2	0	0.281		0.15	123.9	66.2
14	12/14/81	201,923	442.5	0	0.141	(0.211)	0.15	62.5	66.4
15	12/18/81	201,923	445.1	0	0.189		0.15	84.3	66.8
16	12/18/81	198,462	437.5	0	0.139	(0.137)	0.15	60.7	65.6
17	12/18/81	196,622	433.1	0	0.083		0.15	35.9	65.0
18	12/21/82	194,318	434.5	0	0.202		0.15	87.9	65.2
19	12/21/82	195,570	437.1	0	0.225	(0.202)	0.15	98.3	65.6
20	12/21/82	194,444	434.6	0	0.179		0.15	77.6	65.2
21	01/02/83	186,145	410.0	0	0.240		0.15	98.3	61.5
22	01/02/83	190,244	416.0	0	0.221	(0.231)	0.15	92.0	62.4
23	02/26/83	191,250	413.9	0	0.105		0.15	43.3	62.1
24	02/26/83	186,145	404.2	0	0.176	(0.169)	0.15	71.0	60.6
25	02/26/83	190,000	412.0	0	0.226		0.15	93.3	61.8

* Compliance test results, i.e., average of three test runs, except for 12/14/81 and 1/02/83 tests are average of two tests.

APPENDIX E

ANALYSIS OF SO_2 EMISSION FROM BAGASSE BOILERS EQUIPPED WITH SPRAY IMPINGEMENT SCRUBBERS

APPENDIX E

ANALYSIS OF SO_2 EMISSION FROM BAGASSE BOILERS EQUIPPED WITH SPRAY IMPINGEMENT SCRUBBERS

Measurements of SO_2 emissions from bagasse-burning boilers has been performed at the U.S. Sugar Bryant mill by EPA (Monsanto Research Corporation, 1980), at the Sugar Cane Growers Cooperative (SCGC) mill by ESE, and at the Osceola Farms mill by Kleeman Engineering. The results of these tests are summarized in Table E-1. All tests were conducted by EPA and/or DER source test methods. The U.S. Sugar Bryant and Osceola Farms tests were conducted while burning 100-percent bagasse. However, the SCGC tests were conducted while burning approximately 50 x 10^6 Btu/hr of oil (approximately 330 gallons per hour). The heat inputs shown in Table E-1 for SCGC Boiler 8 reflect only the heat input due to bagasse. The oil usage, and associated SO_2 produced, has been ignored in developing the SO_2 removal efficiency for this boiler; therefore, the results are extremely conservative. Nevertheless, the SCGC tests show an overall SO_2 removal efficiency of the system of 97.7 percent and greater. The test results for U.S. Sugar Bryant and Osceola Farms, which were based on conservative assumptions for the sulfur content of bagasse, also reflect overall removals of greater than 98 percent.

The only concurrent test data for scrubber inlet and outlet were obtained at SCGC. The data show better than 90-percent removal of SO_2 within the scrubber itself. The data also reflect an estimated 60-percent loss of theoretical SO_2 before reaching the scrubber. This is probably a result of SO_2 absorption in the bottom ash and fly ash produced in the boiler.

The data presented in the analysis substantiate that an assumed 50-percent SO_2 removal in the bagasse boiler/spray impingement scrubber system when burning bagasse is a very conservative assumption. The data

Table E-1. Summary of SO_2 Source Tests and SO_2 Removal Efficiencies, Florida Sugar Industry

Date	Mill/ Boiler	Steam Load (lb/hr)	Heat Input* (10^6 Btu/hr)	Bagasse Rate† (lb/hr, dry)	Sulfur Content** (%, dry)	Theoretical SO_2 (lb/hr)	Measured Scrubber Inlet SO_2 (lb/hr)	Measured Scrubber Outlet SO_2 (lb/hr)	Scrubber SO_2 Efficiency (%)	Overall SO_2 Efficiency (%)
U.S. Sugar Bryant										
12/17/79	2	142,000	337.6	42,200	0.15	126.6	—	<2.5	—	>98.0
12/18/79	2	151,000	359.8	44,975	0.15	134.9	—	<2.5	—	>98.0
12/18/79	2	144,000	342.8	42,850	0.15	128.6	—	<2.5	—	>98.0
Sugar Cane Growers Coop.										
2/4/83	8	246,429	415.1	51,888	0.1	103.8	45.0	1.7	96.2	98.4
2/4/83	8	243,250	405.3	50,663	0.1	101.3	36.7	1.9	94.8	98.1
2/4/83	8	254,211	427.5	53,438	0.1	106.9	35.4	2.5	92.9	97.7
Osceola Farms (Average of 3 Tests)										
12/22/82	6	135,000	280.0	35,000	0.1	70.0	—	0.07	—	99.9

* Based upon actual steam temperature and pressure measurements and assuming 55-percent boiler efficiency.
† Assumes typical bagasse heating value of 8,000 Btu/lb, dry basis.
** For U.S. Sugar, based upon average bagasse analysis available from Bryant mill (see Appendix A). For Sugar Cane Growers and Osceola mills, a conservatively low content of 0.1-percent sulfur was assumed.

Source: ESE, 1983.

from SCGC Boiler 8 show that assuming 0-percent SO_2 removal when burning small quantities of oil in conjunction with bagasse is also a very conservative assumption.

APPENDIX F

CALCULATION OF CLEWISTON MILL BOILER EXHAUST FLOW RATES

APPENDIX F

CALCULATION OF CLEWISTON MILL BOILER EXHAUST GAS FLOW RATES FOR USE IN SO_2 IMPACT ANALYSIS

I. BAGASSE COMBUSTION--BOILERS 1, 2, and 3

Take average of last 3 years of source test data for tests during which bagasse only was burned (see Appendix D for data compilation).

1. Boiler 1

   Total of nine tests burning bagasse only
   Total heat input from bagasse = 3,794.5 x 10^6 Btu/hr
   Total acfm = 1,263,099
   Average acfm/10^6 Btu/hr = 332.9

2. Boiler 2

   Total of six tests burning bagasse only
   Total heat input from bagasse = 2,393.7 x 10^6 Btu/hr
   Total acfm = 879,692
   Average acfm/10^6 Btu/hr = 367.5

3. Boiler 3

   Total of three tests burning bagasse only
   Total heat input from bagasse = 790 x 10^6 Btu/hr
   Total acfm = 302,043
   Average acfm/10^6 Btu/hr = 382.3

II. NO. 6 FUEL OIL COMBUSTION--ALL BOILERS

	Ultimate Analysis			Theoretical Air Required for Combustion			
	lb per 100 lb Fuel	Molecular Weight	Moles per 100 lb Fuel	Moles/Mole Fuel O_2	Moles/Mole Fuel Dry Air	Moles/100 lb Fuel O_2	Moles/100 lb Fuel Dry Air
C	85.6	12	7.13	1.0	4.76	7.13	33.94
H_2	9.7	2	4.85	0.5	2.38	2.43	11.54
O_2	2.0	32	0.06	--	--	--	--
N_2	0.0	--	0.0	--	--	--	--
S	2.4	32	0.08	1.0	4.76	0.08	0.38
H_2O	0.2	18	0.01	--	--	--	--
Ash	0.1	--	--	--	--	--	--
Total	100.0		12.13			9.64	45.86
				Less O_2 in fuel		-0.06	-0.29*
				Required Theoretical Air		9.58	45.57

	Air Required for Combustion at 20-Percent Excess Air O_2	Dry Air
Total Air @ 20-Percent Excess Air (x 1.20)	11.50	54.68
Excess Air	--	9.11
Excess 02	1.92	--

Products of Combustion

Product	Moles of Combustion Air	Moles of Products/ Mole of Combustion Air	Moles of Products/ 100 lb Fuel
CO_2	7.13 (O_2)	1	7.13
H_2O	4.85 (H_2)	--	6.06†
SO_2	0.08	1	0.08
N_2	54.68	0.79	43.20
O_2	Excess		1.92
		--	58.39 wet moles per 100 lb fuel
			52.33 dry moles per 100 lb fuel

Exit Gas Calculation

Moles Dry Gas/100 lb Wet Fuel = 52.33
Mole H_2O (52.33 x 0.48)** = 25.12
Total Moles Gas/100 lb Wet Fuel = 77.45

Ideal Gas Law: PV = nRT
P = 14.7 psi = 2,116.8 lb/ft^2
n = 77.45 moles
R = 1,545.3 lb-ft/mole-°R
T = 160°F = 620° R

$$V = \frac{nRT}{P} = \frac{77.45 \times 1{,}545.3 \times 620}{2{,}116.8} = 35{,}055\ ft^3/100\ lb\ fuel$$
$$= 350.55\ ft^3/lb\ fuel$$

* Air equivalent to O_2 in fuel (0.06 x 4.76 = 0.29).
† (4.85 x 1) + (54.68 x 0.021) + 0.06
Assumes moisture content of air corresponding to 60-percent relative humidity and 80°F dry bulb temperature: 0.0132 lb H_2O/lb dry air or 0.021 lb mole/lb mole.
** Saturated conditions at 160°F (exhaust gas outlet temperature) = 0.48 lb mole H_2O/lb mole dry air.

III. BOILER 4 BURNING MAXIMUM AMOUNT OF FUEL OIL

225×10^6 Btu/hr oil
Steam = 150,000 lb/hr

No. 6 Fuel Oil: 1,499 gal/hr oil ⟶ 12,295 lb/hr oil
acfm: 350.55 acf/lb oil = 71,834 acfm
Bagasse: 100,000 lb/hr steam
Dry bagasse = 27,273
= 218.18×10^6 Btu/hr

From Table 1-5
For 545.5×10^6 Btu/hr, acfm = 205,180 or 376.13 acfm/10^6 Btu/hr
$218.18 \times 10^6 \times 376.13/10^6$ = 82,064 acfm

Total acfm = 71,834 + 82,064 = 153,898 acfm
Diameter = 7.25 ft
Area = 41.28
Therefore, velocity = 18.94 m/s.

Source: ESE, 1983.

APPENDIX G

PROPOSED BOILER 4
EMISSION ESTIMATES

APPENDIX G

PROPOSED BOILER 4
EMISSION ESTIMATES

I. FUEL USAGE CALCULATIONS

A. BOILER DATA

Maximum steam capacity = 250,000 lb/hr when firing bagasse,
= 150,000 lb/hr when firing oil
Btu value of water entering boiler = 250 Btu/lb
Btu value of water leaving boiler = 1,450 Btu/lb
Btu requirements per lb steam = 1,450-250 = 1,200 Btu/lb
Boiler efficiency = 55 percent when firing bagasse
= 80 percent when firing oil

B. FUEL ANALYSIS

Parameter	Bagasse (dry basis)	No. 6 Fuel Oil*
Btu/lb	8,000	18,300
lb/gal	--	8.2 (API gravity 11.8)
% Sulfur	0.1 (avg), 0.2 (max)	2.5 max
% Nitrogen	0.3	0
% Ash	0.5-0.3	0.1
% H_2O	0 (55% wet)	0.2

C. BAGASSE BURNING

250,000 lb/hr steam x 1,200 Btu/lb ÷ 0.55 = 545.5 x 10^6 Btu/hr
545.5 x 10^6 Btu/hr ÷ 8,000 Btu/lb = 68,182 lb/hr dry bagasse
= 151,528 lb/hr wet bagasse

D. OIL BURNING

150,000 lb/hr steam x 1,200 Btu/lb ÷ 0.80 = 225.0 x 10^6 Btu/hr
225.0 x 10^6 Btu/hr ÷ 18,300 Btu/lb = 12,295 lb/hr oil
= 1,499 gal/hr oil

* Typical specifications for No. 6 oil of 2.4-percent sulfur content, based upon conversation with Mr. Tom Rayburg, Area Manager for Belcher Oil Company (305/848-1495).

II. MAXIMUM AND POTENTIAL EMISSIONS

Potential emissions are based upon 24 hr/day, 182-day/crop season

A. BURNING BAGASSE

Particulate
Allowables = 545.5 x 10^6 Btu/hr x 0.2 lb particulate/10^6 Btu = 109.1 lb/hr.

Potential emissions: from "Compilation of Emission Factors," U.S. Environmental Protection Agency (EPA), AP-42, Table 1.8-1
16 lb/ton bagasse (wet) x 151,528 lb/hr bagasse (wet) ÷ 2,000 = 1,212 lb/hr = 2,647 tons/yr

Sulfur Dioxide (based on scrubber removal of 50%)
Maximum emissions = 68,182 lb/hr bagasse (dry) x 0.002 x 2 x 0.5 = 136.4 lb/hr

Potential emissions = 136.4 lb/hr ÷ 0.5 = 272.8 lb/hr = 596 tons/yr

Nitrogen Oxides
Maximum and potential emissions: from AP-42, Table 1.8-1
1.2 lb/ton bagasse (wet) x 151,528 ÷ 2,000 = 90.9 lb/hr
= 199 tons/yr

Carbon Monoxide
Maximum and potential emissions: Best emission factor available is from AP-42 for wood waste combustion (Table 1.6-1), lb/ton = 4 to 47. However, these values seem very high; therefore, Reference 30 listed in Table 1.6-1 was reviewed. This review showed that average CO emissions from similar sized boilers (B and D) were 0.26 and 0.24 lb/10^6 Btu, respectively. Using an average value of 0.25 lb/10^6 Btu, we have:

0.25 lb/10^6 Btu x 545.5 x 10^6 Btu/hr = 136.4 lb/hr = 298 tons/yr

Volatile Organic Compounds
Maximum and potential emissions: Best factor from AP-42, Table 1.6-1 for wood waste combustion:
lb/ton = 1.4 + 0.3 = 1.7
1.7 lb/ton x 151,528 ÷ 2,000 = 128.8 lb/hr
= 281 tons/yr

B. BURNING FUEL OIL AT 225 x 10^6 BTU/HR AND 500,000 GAL/YR

Particulate
Allowable and maximum emissions = 225 x 10^6 Btu/hr x 0.1 lb/10^6 Btu = 22.5 lb/hr

Potential emissions: from AP-42 Table 1.3-1, for utility boilers
$1b/10^3$ gal = 10(S) + 3 = 10(2.5) + 3 = 28
1,499 gal/hr x 28 $1b/10^3$ gal = 42.0 lb/hr
500,000 gal/yr x 28 $1b/10^3$ gal ÷ 2,000 = 7.0 tons/yr

Sulfur Dioxide (based upon no removal in scrubber)
Maximum and potential emissions: from AP-42 Table 1.3-1
$1b/10^3$ gal = 157 (S) = 157(2.5) = 392.5
1,499 x 392.5 = 588.4 lb/hr
500,000 x $392.5/10^3$ ÷ 2,000 = 98 tons/yr

Nitrogen Oxides
Maximum and potential emissions: from AP-42 Table 1.3-1, for utility boilers
67 $1b/10^3$ gal x 1,499 = 100.4 lb/hr
500,000 x $67/10^3$ ÷ 2,000 = 17 tons/yr

Volatile Organic Compounds
Maximum and potential emissions: from AP-42, Table 1.3-1
(0.76 + 0.28) $1b/10^3$ gal x 1,499 = 1.56 lb/hr
500,000 x $1.04/10^3$ ÷ 2,000 = 0.3 tons/yr

Carbon Monoxide
Maximum and potential emissions: from AP-42, Table 1.3-1
5 $1b/10^3$ x 1,499 = 7.50 lb/hr
500,000 x $5/10^3$ ÷ 2,000 = 1.3 tons/yr

Mercury, Beryllium, Fluorides, and Sulfuric Acid Mist
Based upon emission factors in "Health Impacts, Emissions, and Emission Factors for Noncriteria Pollutants Subject to De Minimis Guidelines and Emitted from Stationary Conventional Combustion Processes," EPA-450/2-80-074, June 1980. Typical trace element concentration of No. 6 fuel oil (C) in ppm also attached. Assume no removal of trace elements in wet scrubbers.

Mercury: Maximum and potential emissions
$1b/10^{12}$ Btu = 23 C x 2.33 = 23 (0.04) x 2.33 = 2.14
225 x 10^6 Btu/hr x 2.14 $1b/10^{12}$ Btu = 0.0005 lb/hr
500,000 gal/hr x 8.2 lb/gal x 18,300 Btu/lb x 2.14 $1b/10^{12}$ Btu ÷ 2,000 = 8.0 x 10^{-5} tons/yr

Beryllium: Maximum and potential emissions
$1b/10^{12}$ Btu = 24 C x 2.33 = 24 (0.08) x 2.33 = 4.47
225 x 10^6 x $4.47/10^{12}$ = 0.001 lb/hr
500,000 x 8.2 x 18,300 x $4.47/10^{12}$ ÷ 2,000 = 1.7 x 10^{-4} tons/yr

Fluorides: Maximum and potential emissions
$1b/10^{12}$ Btu = 23 C x 2.33 = 23 (0.12) x 2.33 = 6.43
225 x 10^6 x $6.43/10^{12}$ = 0.0014 lb/hr
500,000 x 8.2 x 18,300 x $6.43/10^{12}$ ÷ 2,000 = 2.4 x 10^{-4} tons/yr

Sulfuric Acid Mist: Maximum and potential emissions--Use factor for oil-fired utility boilers.

$16.9 \text{ S} \times 2,326 \text{ lb}/10^{12}$ Btu
$S = 2.5\%$
$\text{lb}/10^{12}$ Btu = 16.9 (2.5) x 2,326 = 98,274
$225 \times 10^6 \times 98,274/10^{12} = 22.1$ lb/hr
$500,000 \times 8.2 \times 18,300 \times 98,274/10^{12} \div 2,000 = 3.7$ tons/yr

Arsenic: Maximum and potential emissions--see attached reference for best factor available.

18 pg/J x 2.33 = 41.9 $\text{lb}/10^{12}$ Btu
$225 \times 10^6 \times 41.9/10^{12} = 0.009$ lb/hr
$500,000 \times 8.2 \times 18,300 \times 41.9/10^{12} \div 2,000 = 0.0016$ ton/yr

Lead: Maximum and potential emissions--see attached reference for best factor available.

80 pg/J x 2.33 = 186.4 $\text{lb}/10^{12}$ Btu
$225 \times 10^6 \times 186.4/10^{12} = 0.042$ lb/hr
$500,000 \times 8.2 \times 18,300 \times 186.4/10^{12} \div 2,000 = 0.007$ ton/yr

Other Regulated Pollutants

No emission factors for other regulated pollutants are known to exist for bagasse or oil burning, nor are emissions of other pollutants considered to be significant.

C. WORST-CASE EMISSIONS

Particulate

Burning bagasse = 109.1 lb/hr

Sulfur Dioxide

Burning fuel oil at 225×10^6 Btu/hr, with remainder of steam capacity from bagasse

SO_2 due to oil = 588.4 lb/hr
Steam due to oil = 150,000 lb/hr
Remaining steam due to bagasse = 250,000-150,000 = 100,000 lb/hr
Dry bagasse required = 100,000 lb/hr x 1,200 Btu/lb ÷ 0.55 ÷ 8,000 Btu/lb = 27,273 lb/hr
SO_2 due to bagasse = 27,273 x 0.002 x 2 x 0.5 = 54.5 lb/hr
Total SO_2 = 588.4 + 54.5 = 642.9 lb/hr

Nitrogen Oxides

Fuel-oil burning produces maximum NO_x emissions. Therefore, maximum NO_x occurs when burning maximum fuel with the rest of the steam supplied by bagasse.

NO_x due to oil = 100.4 lb/hr
Steam due to oil = 150,000 lb/hr (see SO_2 above)
Steam due to bagasse = 100,000 lb/hr
Bagasse required = 27,273 lb/hr (dry) ÷ 0.45 = 60,607 lb/hr (wet)
NO_x due to bagasse = 60,607 x 1.2 ÷ 2,000 = 36.4 lb/hr
Total NO_x = 100.4 + 36.4 = 136.8 lb/hr

Carbon Monoxide
Burning bagasse = 136.4 lb/hr

Volatile Organic Compounds
Burning bagasse = 128.8 lb/hr

Mercury, Beryllium, Fluorides, Sulfuric Acid Mist, Arsenic, and Lead
Since all estimated emissions are from fuel oil burning, maximum emissions are the same as those calculated for fuel oil burning.

Mercury = 0.0005 lb/hr
Beryllium = 0.001 lb/hr
Fluorides = 0.0014 lb/hr
Sulfuric acid mist = 22.1 lb/hr
Arsenic = 0.009 lb/hr
Lead = 0.042 lb/hr

D. POTENTIAL EMISSIONS

Particulates
Maximum potential is due to burning bagasse
= 1,212 lb/hr = 2,647 tons/yr

Sulfur Dioxide
Maximum potential due to burning fuel oil at maximum rate, with remainder of steam capacity supplied from bagasse. No removal in scrubber.

Potential due to oil = 588.4 lb/hr
Potential due to bagasse = 54.5 lb/hr ÷ 0.5 = 109.0 lb/hr
Total potential SO_2 = 697.4 lb/hr
Annual potential due to oil = 98 tons/yr
Annual potential due to bagasse:
500,000 gal/yr oil ÷ 1,499 gal/hr oil = 333.6 hr/yr on oil at 150,000 lb/hr steam
Hours on bagasse at 100,000 lb/hr steam = 333.6
SO_2 = 333.6 x 54.5 ÷ 0.5 ÷ 2,000 = 18.2 tons/yr
Hours on bagasse at 250,000 lb/hr steam = (182 x 24) - 333.6 = 4,034.4 hr
SO_2 = 4,034.4 hr x 272.8 lb/hr ÷ 2,000 = 550.3 tons/yr
Total annual potential = 98 + 18.2 + 550.3 = 666.5 tons/yr

Nitrogen Oxides
Same reasoning as for SO_2.

Hourly potential = Worst-case emissions = 136.8 lb/hr
Annual potential due to oil = 17 tons/yr
Annual potential due to bagasse:
@ 100,000 lb/hr steam: 333.6 x 36.4 lb/hr ÷ 2,000 = 6.1 tons/yr
@ 250,000 lb/hr steam: 4,034.4 x 90.9 lb/hr ÷ 2,000 = 183.4 tons/yr
Total annual potential = 17 + 6.1 + 183.4 = 206 tons/yr

Carbon Monoxide
Maximum potential due to bagasse burning = 136.4 lb/hr
= 298 tons/yr

Volatile Organic Compounds
Maximum potential due to bagasse burning = 128.8 lb/hr
= 281 tons/yr

Mercury, Beryllium, Fluorides, Sulfuric Acid Mist, Arsenic, and Lead
All due to oil burning; same as potential emissions (see Section II.B).

III. ACTUAL EMISSIONS

Maximum actual emissions are based upon the worst-case fuel and 182 crop days/yr.

A. The following pollutants are maximized when burning bagasse:
Particulate: 109.1 lb/hr x 24 x 182 ÷ 2,000 = 238.3 tons/yr
Carbon Monoxide: 136.4 lb/hr, or 298 tons/yr
Volatile Organic Compounds: 128.8 lb/hr, or 281 tons/yr

B. The following pollutants are maximized when burning fuel oil; maximum actual emissions are based upon 500,000 gallons of oil burned per year, with remainder of steam capacity due to bagasse burning (see also Worst-Case Emissions section). Hours on oil = 333.6.

Sulfur Dioxide
Oil = 98.1 tons/yr (Section II.B)
Bagasse = 54.5 x 333.6 ÷ 2,000 = 9.1 tons/yr
136.4 x 4,034.4 hr/yr ÷ 2,000 = 275.1 tons/yr
Total = 98.1 + 9.1 + 275.1 = 382.3 tons/yr

Nitrogen Oxides
Same as potential emissions = 206 tons/yr

Mercury, Beryllium, Fluorides, Sulfuric Acid Mist, Arsenic, and Lead
Same as potential emissions (see Section II.B).

REFERENCES FOR SO_2, PARTICULATE, NITROGEN OXIDES, VOLATILE ORGANIC COMPOUNDS AND CARBON MONOXIDE FROM FUEL OIL COMBUSTION

1.3 FUEL OIL COMBUSTION

1.3.1 General[1,2,22]

Fuel oils are broadly classified into two major types, distillate and residual. Distillate oils (fuel oil grade Nos. 1 and 2) are used mainly in domestic and small commercial applications in which easy fuel burning is required. Distillates are more volatile and less viscous than residual oils, having negligible ash and nitrogen contents and usually containing less than 0.3 weight percent sulfur. Residual oils (grade Nos. 4, 5 and 6), on the other hand, are used mainly in utility, industrial and large commercial applications with sophisticated combustion equipment. No. 4 oil is sometimes classified as a distillate, and No. 6 is sometimes referred to as Bunker C. Being more viscous and less volatile than distillate oils, the heavier residual oils (Nos. 5 and 6) must be heated to facilitate handling and proper atomization. Because residual oils are produced from the residue left after lighter fractions (gasoline, kerosene and distillate oils) have been removed from the crude oil, they contain significant quantities of ash, nitrogen and sulfur. Properties of typical fuel oils are given in Appendix A.

1.3.2 Emissions

Emissions from fuel oil combustion are dependent on the grade and composition of the fuel, the type and size of the boiler, the firing and loading practices used, and the level of equipment maintenance. Table 1.3-1 presents emission factors for fuel oil combustion in units without control equipment. The emission factors for industrial and commercial boilers are divided into distillate and residual oil categories because the combustion of each produces significantly different emissions of particulates, SO_x and NO_x. The reader is urged to consult the references for a detailed discussion of the parameters that affect emissions from oil combustion.

Particulate Matter[3-7,12-13,24,26-27] - Particulate emissions are most dependent on the grade of fuel fired. The lighter distillate oils result in significantly lower particulate formation than do the heavier residual oils. Among residual oils, Nos. 4 and 5 usually result in less particulate than does the heavier No. 6.

In boilers firing No. 6, particulate emissions can be described, on the average, as a function of the sulfur content of the oil. As shown in Table 1.3-1 (Footnote g), particulate emissions can be reduced considerably when low-sulfur grade 6 oil is fired. This is because low sulfur No. 6, whether refined from naturally occurring low sulfur crude oil or desulfurized by one of several current processes, exhibits substantially lower viscosity and reduced asphaltene, ash and sulfur - all of which results in better atomization and cleaner combustion.

TABLE 1.3-1. UNCONTROLLED EMISSION FACTORS FOR FUEL OIL COMBUSTION

EMISSION FACTOR RATING: A

Boiler Type[a]	Particulate Matter[b]		Sulfur Dioxide[c]		Sulfur Trioxide		Carbon Monoxide[d]		Nitrogen Oxide[e]		Volatile Organics[f] Nonmethane		Volatile Organics[f] Methane	
	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal	kg/10^3l	lb/10^3gal
Utility Boilers														
Residual Oil	[g]	[g]	19S	157S	0.34S[h]	2.9S[h]	0.6	5	8.0 (12.6)(5)[i]	67 (105)(42)[i]	0.09	0.76	0.03	0.28
Industrial Boilers														
Residual Oil	[g]	[g]	19S	157S	0.24S	2S	0.6	5	6.6[j]	55[j]	0.034	0.28	0.12	1.0
Distillate Oil	0.24	2	17S	142S	0.24S	2S	0.6	5	2.4	20	0.024	0.2	0.006	0.052
Commercial Boilers														
Residual Oil	[g]	[g]	19S	157S	0.24S	2S	0.6	5	6.6	55	0.14	1.13	0.057	0.475
Distillate Oil	0.24	2	17S	142S	0.24S	2S	0.6	5	2.4	20	0.04	0.34	0.026	0.216
Residential Furnaces														
Distillate Oil	0.3	2.5	17S	142S	0.24S	2S	0.6	5	2.2	18	0.085	0.713	0.214	1.78

[a] Boilers can be approximately classified according to their gross (higher) heat rate as shown below:
Utility (power plant) boilers: >106 x 10^9 J/hr (>100 x 10^6 Btu/hr)
Industrial boilers: 10.6 x 10^9 to 106 x 10^9 J/hr (10 x 10^6 to 100 x 10^6 Btu/hr)
Commercial boilers: 0.5 x 10^9 to 10.6 x 10^9 J/hr (0.5 x 10^6 to 10 x 10^6 Btu/hr)
Residential furnaces: <0.5 x 10^9 J/hr (<0.5 x 10^6 Btu/hr)

[b] References 3-7 and 24-25. Particulate matter is defined in this section as that material collected by EPA Method 5 (front half catch).

[c] References 1-5. S indicates that the weight % of sulfur in the oil should be multiplied by the value given.

[d] References 3-5 and 8-10. Carbon monoxide emissions may increase by factors of 10 to 100 if the unit is improperly operated or not well maintained.

[e] Expressed as NO_2. References 1-5, 8-11, 17 and 26. Test results indicate that at least 95% by weight of NO_x is NO for all boiler types except residential furnaces, where about 75% is NO.

[f] References 18-21. Volatile organic compound emissions are generally negligible unless boiler is improperly operated or not well maintained, in which case emissions may increase by several orders of magnitude.

[g] Particulate emission factors for residual oil combustion are, on average, a function of fuel oil grade and sulfur content:
Grade 6 oil: 1.25(S) + 0.38 kg/10^3 liter [10(S) + 3 lb/10^3 gal] where S is the weight % of sulfur in the oil. This relationship is based on 81 individual tests and has a correlation coefficient of 0.65.
Grade 5 oil: 1.25 kg/10^3 liter (10 lb/10^3 gal)
Grade 4 oil: 0.88 kg/10^3 liter (7 lb/10^3 gal)

[h] Reference 25.

[i] Use 5 kg/10^3 liters (42 lb/10^3 gal) for tangentially fired boilers, 12.6 kg/10^3 liters (105 lb/10^3gal) for vertical fired boilers, and 8.0 kg/10^3 liters (67 lb/10^3 gal) for all others, at full load and normal (>15%) excess air. Several combustion modifications can be employed for NO_x reduction: (1) limited excess air can reduce NO_x emissions 5-20%, (2) staged combustion 20-40%, (3) using low NO_x burners 20-50%, and (4) ammonia injection can reduce NO_x emissions 40-70% but may increase emissions of ammonia. Combinations of these modifications have been employed for further reductions in certain boilers. See Reference 23 for a discussion of these and other NO_x reducing techniques and their operational and environmental impacts.

[j] Nitrogen oxides emissions from residual oil combustion in industrial and commercial boilers are strongly related to fuel nitrogen content, estimated more accurately by the empirical relationship:
kg NO_2/10^3 liters = 2.75 + $50(N)^2$ [lb NO_2/10^3gal = 22 + $400(N)^2$] where N is the weight % of nitrogen in the oil. For residual oils having high (>0.5 weight %) nitrogen content, use 15 kg NO_2/10^3 liter (120 lb NO_2/10^3gal) as an emission factor.

Boiler load can also affect particulate emissions in units firing No. 6 oil. At low load conditions, particulate emissions may be lowered by 30 to 40 percent from utility boilers and by as much as 60 percent from small industrial and commercial units. No significant particulate reductions have been noted at low loads from boilers firing any of the lighter grades, however. At too low a load condition, proper combustion conditions cannot be maintained, and particulate emissions may increase drastically. It should be noted, in this regard, that any condition that prevents proper boiler operation can result in excessive particulate formation.

Sulfur Oxides (SO_x)[1-5,25,27] - Total sulfur oxide emissions are almost entirely dependent on the sulfur content of the fuel and are not affected by boiler size burner design, or grade of fuel being fired. On the average, more than 95 percent of the fuel sulfur is emitted as SO_2, about 1 to 5 percent as SO_3 and about 1 to 3 percent as particulate sulfates. Sulfur trioxide readily reacts with water vapor (both in air and in flue gases) to form a sulfuric acid mist.

Nitrogen Oxides (NO_x)[1-11,14,17,23,27] - Two mechanisms form nitrogen oxides, oxidation of fuelbound nitrogen and thermal fixation of the nitrogen in combustion air. Fuel NO_x are primarily a function of the nitrogen content of the fuel and the available oxygen (on the average, about 45 percent of the fuel nitrogen is converted to NO_x, but this may vary from 20 to 70 percent). Thermal NO_x, on the other hand, are largely a function of peak flame temperature and available oxygen - factors which depend on boiler size, firing configuration and operating practices.

Fuel nitrogen conversion is the more important NO_x forming mechanism in residual oil boilers. Except in certain large units having unusually high peak flame temperatures, or in units firing a low nitrogen residual oil, fuel NO_x will generally account for over 50 percent of the total NO_x generated. Thermal fixation, on the other hand, is the dominant NO_x forming mechanism in units firing distillate oils, primarily because of the negligible nitrogen content in these lighter oils. Because distillate oil fired boilers usually have low heat release rates, however, the quantity of thermal NO_x formed in them is less than that of larger units.

A number of variables influence how much NO_x is formed by these two mechanisms. One important variable is firing configuration. Nitrogen oxide emissions from tangentially (corner) fired boilers are, on the average, less than those of horizontally opposed units. Also important are the firing practices employed during boiler operation. Limited excess air firing, flue gas recirculation, staged combustion, or some combination thereof may result in NO_x reductions from 5 to 60 percent. See Section 1.4 for a discussion of these techniques. Load reduction can likewise decrease NO_x production. Nitrogen oxides emissions may be reduced from 0.5 to 1 percent for each percentage reduction in load from full load operation. It should be noted that most of these variables, with the exception of excess air, influence the NO_x emissions only of large oil fired boilers. Limited excess air firing is possible in many small boilers, but the resulting NO_x reductions are not nearly as significant.

Other Pollutants[18-21] - As a rule, only minor amounts of volatile organic compounds (VOC) and carbon monoxide will be emitted from the combustion of fuel oil. The rate at which VOCs are emitted depends on combustion efficiency. Emissions of trace elements from oil fired boilers are relative to the trace element concentrations of the oil.

Organic compounds present in the flue gas streams of boilers include aliphatic and aromatic hydrocarbons, esters, ethers, alcohols, carbonyls, carboxylic acids and polycylic organic matter. The last includes all organic matter having two or more benzene rings.

Trace elements are also emitted from the combustion of fuel oil. The quantity of trace elements emitted depends on combustion temperature, fuel feed mechanism and the composition of the fuel. The temperature determines the degree of volatilization of specific compounds contained in the fuel. The fuel feed mechanism affects the separation of emissions into bottom ash and fly ash.

If a boiler unit is operated improperly or is poorly maintained, the concentrations of carbon monoxide and VOCs may increase by several orders of magnitude.

1.3.3 Controls

The various control devices and/or techniques employed on oil fired boilers depend on the type of boiler and the pollutant being controlled. All such controls may be classified into three categories, boiler modification, fuel substitution and flue gas cleaning.

Boiler Modification[1-4,8-9,13-14,23] - Boiler modification includes any physical change in the boiler apparatus itself or in its operation. Maintenance of the burner system, for example, is important to assure proper atomization and subsequent minimization of any unburned combustibles. Periodic tuning is important in small units for maximum operating efficiency and emission control, particularly of smoke and CO. Combustion modifications, such as limited excess air firing, flue gas recirculation, staged combustion and reduced load operation, result in lowered NO_x emissions in large facilities. See Table 1.3-1 for specific reductions possible through these combustion modifications.

Fuel Substitution[3,5,12,28] - Fuel substitution, the firing of "cleaner" fuel oils, can substantially reduce emissions of a number of pollutants. Lower sulfur oils, for instance, will reduce SO_x emissions in all boilers, regardless of size or type of unit or grade of oil fired. Particulates generally will be reduced when a lighter grade of oil is fired. Nitrogen oxide emissions will be reduced by switching to either a distillate oil or a residual oil with less nitrogen. The practice of fuel substitution, however, may be limited by the ability of a given operation to fire a better grade of oil and by the cost and availability thereof.

Flue Gas Cleaning[15-16,28] - Flue gas cleaning equipment generally is employed only on large oil fired boilers. Mechanical collectors, a prevalent type of control device, are primarily useful in controlling particulates generated during soot blowing, during upset conditions, or when a very dirty, heavy oil is fired. During these situations, high efficiency cyclonic collectors can effect up to 85 percent control of particulate. Under normal firing conditions or when a clean oil is combusted, cyclonic collectors will not be nearly as effective due to a high percentage of small particles (less than 3 microns diameter) being emitted.

Electrostatic precipitators are commonly used in oil fired power plants. Older precipitators which are also small precipitators generally remove 40 to 60 percent of the particulate matter emissions. Due to the low ash content of the oil, greater collection efficiency may not be required. Today, new or rebuilt electrostatic precipitators have collection efficiencies of up to 90 percent.

Scrubbing systems have been installed on oil-fired boilers, especially of late, to control both sulfur oxides and particulate. These systems can achieve SO_2 removal efficiencies of up to 90 to 95 percent and provide particulate control efficiencies on the order of 50 to 60 percent.

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2. J. A. Danielson (ed.), Air Pollution Engineering Manual, Second Edition, AP-40, U.S. Environmental Protection Agency, Research Triangle Park, NC, 1973. Out of Print.

3. A. Levy, et al., A Field Investigation of Emissions from Fuel Oil Combustion for Space Heating, API Bulletin 4099, Battelle Columbus Laboratories, Columbia, OH, November 1971.

4. R. E. Barrett, et al., Field Investigation of Emissions from Combustion Equipment for Space Heating, EPA-R2-73-084a, U.S. Environmental Protection Agency, Research Triangle Park, NC, June 1973.

5. G. A. Cato, et al., Field Testing: Application of Combustion Modifications To Control Pollutant Emissions from Industrial Boilers - Phase I, EPA-650/2-74-078a, U.S. Environmental Protection Agency, Research Triangle Park, NC, October 1974.

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7. Particulate Emission Control Systems for Oil-Fired Boilers, EPA-450/3-74-063, U.S. Environmental Protection Agency, Research Triangle Park, NC, December 1974.

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REFERENCES FOR PARTICULATE, SO_2, AND NITROGEN OXIDES EMISSIONS FROM BAGASSE COMBUSTION

1.8 BAGASSE COMBUSTION IN SUGAR MILLS

by Tom Lahre

1.8.1 General[1]

Bagasse is the fibrous residue from sugar cane that has been processed in a sugar mill. (See Section 6.12 for a brief general description of sugar cane processing.) It is fired in boilers to eliminate a large solid waste disposal problem and to produce steam and electricity to meet the mill's power requirements. Bagasse represents about 30 percent of the weight of the raw sugar cane. Because of the high moisture content (usually at least 50 percent, by weight) a typical heating value of wet bagasse will range from 3000 to 4000 Btu/lb (1660 to 2220 kcal/kg). Fuel oil may be fired with bagasse when the mill's power requirements cannot be met by burning only bagasse or when bagasse is too wet to support combustion.

The United States sugar industry is located in Florida, Louisiana, Hawaii, Texas, and Puerto Rico. Except in Hawaii, where raw sugar production takes place year round, sugar mills operate seasonally, from 2 to 5 months per year.

Bagasse is commonly fired in boilers employing either a solid hearth or traveling grate. In the former, bagasse is gravity fed through chutes and forms a pile of burning fibers. The burning occurs on the surface of the pile with combustion air supplied through primary and secondary ports located in the furnace walls. This kind of boiler is common in older mills in the sugar cane industry. Newer boilers, on the other hand, may employ traveling-grate stokers. Underfire air is used to suspend the bagasse, and overfired air is supplied to complete combustion. This kind of boiler requires bagasse with a higher percentage of fines, a moisture content not over 50 percent, and more experienced operating personnel.

1.8.2 Emissions and Controls[1]

Particulate is the major pollutant of concern from bagasse boilers. Unless an auxiliary fuel is fired, few sulfur oxides will be emitted because of the low sulfur content (<0.1 percent, by weight) of bagasse. Some nitrogen oxides are emitted, although the quantities appear to be somewhat lower (on an equivalent heat input basis) than are emitted from conventional fossil fuel boilers.

Particulate emissions are reduced by the use of multi-cyclones and wet scrubbers. Multi-cyclones are reportedly 20 to 60 percent efficient on particulate from bagasse boilers, whereas scrubbers (either venturi or the spray impingement type) are usually 90 percent or more efficient. Other types of control equipment have been investigated but have not been found to be practical.

Emission factors for bagasse fired boilers are shown in Table 1.8-1.

Table 1.8-1. EMISSION FACTORS FOR UNCONTROLLED BAGASSE BOILERS
EMISSION FACTOR RATING: C

	Emission factors			
	lb/10^3 lb steam[a]	g/kg steam[a]	lb/ton bagasse[b]	kg/MT bagasse[b]
Particulate[c]	4	4	16	8
Sulfur oxides	d	d	d	d
Nitrogen oxides[e]	0.3	0.3	1.2	0.6

[a] Emission factors are expressed in terms of the amount of steam produced, as most mills do not monitor the amount of bagasse fired. These factors should be applied only to that fraction of steam resulting from bagasse combustion. If a significant amount (>25% of total Btu input) of fuel oil is fired with the bagasse, the appropriate emission factors from Table 1.3-1 should be used to estimate the emission contributions from the fuel oil.

[b] Emissions are expressed in terms of wet bagasse, containing approximately 50 percent moisture, by weight. As a rule of thumb, about 2 pounds (2 kg) of steam are produced from 1 pound (1 kg) of wet bagasse.

[c] Multi-cyclones are reportedly 20 to 60 percent efficient on particulate from bagasse boilers. Wet scrubbers are capable of effecting 90 or more percent particulate control. Based on Reference 1.

[d] Sulfur oxide emissions from the firing of bagasse alone would be expected to be negligible as bagasse typically contains less than 0.1 percent sulfur, by weight. If fuel oil is fired with bagasse, the appropriate factors from Table 1.3-1 should be used to estimate sulfur oxide emissions.

[e] Based on Reference 1.

Reference for Section 1.8

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REFERENCES FOR VOLATILE ORGANIC COMPOUND AND CARBON MONOXIDE EMISSIONS FROM BAGASSE COMBUSTION

1.6 WOOD WASTE COMBUSTION IN BOILERS

1.6.1 General[1-3]

The burning of wood waste in boilers is mostly confined to those industries where it is available as a byproduct. It is burned both to obtain heat energy and to alleviate possible solid waste disposal problems. Wood waste may include large pieces like slabs, logs and bark strips as well as cuttings, shavings, pellets and sawdust, and heating values for this waste range from about 4,400 to 5,000 kilocalories per kilogram of fuel dry weight (7,940 to 9,131 Btu/lb). However, because of typical moisture contents of 40 to 75 percent, the heating values for many wood waste materials as fired range as low as 2,200 to 3,300 kilocalories per kilogram of fuel. Generally, bark is the major type of waste burned in pulp mills, and a varying mixture of wood and bark waste, or wood waste alone, are most frequently burned in the lumber, furniture and plywood industries.

1.6.2 Firing Practices[1-3]

A variety of boiler firing configurations is used for burning wood waste. One common type in smaller operations is the dutch oven, or extension type of furnace with a flat grate. This unit is widely used because it can burn fuels with a very high moisture content. Fuel is fed into the oven through apertures at the top of a firebox and is fired in a cone shaped pile on a flat grate. The burning is done in two stages, drying and gasification, and combustion of gaseous products. The first stage takes place in a cell separated from the boiler section by a bridge wall. The combustion stage takes place in the main boiler section. The dutch oven is not responsive to changes in steam load, and it provides poor combustion control.

In a fuel cell oven, the fuel is dropped onto suspended fixed grates and is fired in a pile. Unlike the dutch oven, the fuel cell also uses combustion air preheating and repositioning of the secondary and tertiary air injection ports to improve boiler efficiency.

In many large operations, more conventional boilers have been modified to burn wood waste. These units may include spreader stokers with traveling grates, vibrating grate stokers, etc., as well as tangentially fired or cyclone fired boilers. The most widely used of these configurations is the spreader stoker. Fuel is dropped in front of an air jet which casts the fuel out over a moving grate, spreading it in an even thin blanket. The burning is done in three stages in a single chamber, (1) drying, (2) distillation and burning of volatile matter and (3) burning of carbon. This type of operation has a fast response to load changes, has improved combustion control and can be operated with multiple fuels. Natural gas or oil are often fired in spreader stoker boilers as auxiliary fuel. This is done to maintain constant steam when the wood waste supply fluctuates and/or to provide more steam than is possible from the waste supply alone.

Sander dust is often burned in various boiler types at plywood, particle board and furniture plants. Sander dust contains fine wood particles with low moisture content (less than 20 weight percent). It is fired in a flaming horizontal torch, usually with natural gas as an ignition aid or supplementary fuel.

1.6.3 Emissions and Controls[4-28]

The major pollutant of concern from wood boilers is particulate matter, although other pollutants, particularly carbon monoxide, may be emitted in significant amounts under poor operating conditions. These emissions depend on a number of variables, including (1) the composition of the waste fuel burned, (2) the degree of flyash reinjection employed and (3) furnace design and operating conditions.

The composition of wood waste depends largely on the industry whence it originates. Pulping operations, for example, produce great quantities of bark that may contain more than 70 weight percent moisture and sand and other noncombustibles. Because of this, bark boilers in pulp mills may emit considerable amounts of particulate matter to the atmosphere unless they are well controlled. On the other hand, some operations such as furniture manufacture produce a clean dry (5 to 50 weight percent moisture) wood waste that results in relatively few particulate emissions when properly burned. Still other operations, such as sawmills, burn a variable mixture of bark and wood waste that results in particulate emissions somewhere between these two extremes.

Furnace design and operating conditions are particularly important when firing wood waste. For example, because of the high moisture content that can be present in this waste, a larger than usual area of refractory surface is often necessary to dry the fuel before combustion. In addition, sufficient secondary air must be supplied over the fuel bed to burn the volatiles that account for most of the combustible material in the waste. When proper drying conditions do not exist, or when secondary combustion is incomplete, the combustion temperature is lowered, and increased particulate, carbon monoxide and hydrocarbon emissions may result. Lowering of combustion temperature generally results in decreased nitrogen oxide emissions. Also, emissions can fluctuate in the short term due to significant variations in fuel moisture content over short periods of time.

Flyash reinjection, which is common in many larger boilers to improve fuel efficiency, has a considerable effect on particulate emissions. Because a fraction of the collected flyash is reinjected into the boiler, the dust loading from the furnace, and consequently from the collection device, increases significantly per unit of wood waste burned. It is reported that full reinjection can cause

TABLE 1.6-1. EMISSION FACTORS FOR WOOD AND BARK COMBUSTION IN BOILERS

Pollutant/Fuel Type	kg/Mg	lb/ton	Emission Factor Rating
Particulate[a,b]			
Bark[c]			
Multiclone, with flyash reinjection[d]	7	14	B
Multiclone, without flyash reinjection[d]	4.5	9	B
Uncontrolled	24	47	B
Wood/bark mixture[e]			
Multiclone, with flyash reinjection[d,f]	3	6	C
Multiclone, without flyash reinjection[d,f]	2.7	5.3	C
Uncontrolled[g]	3.6	7.2	C
Wood[h]			
Uncontrolled	4.4	8.8	C
Sulfur Dioxide[i]	0.075 (0.01 - 0.2)	0.15 (0.02 - 0.4)	B
Nitrogen Oxides (as NO_2)[j]			
50,000 - 400,000 lb steam/hr	1.4	2.8	B
<50,000 lb steam/hr	0.34	0.68	B
Carbon Monoxide[k]	2-24	4-47	C
VOC			
Nonmethane[l]	0.7	1.4	D
Methane[m]	0.15	0.3	E

[a]References 2,4,9,17-18. For boilers burning gas or oil as an auxiliary fuel, all particulates are assumed to result from only wood waste fuel.
[b]May include condensible hydrocarbons consisting of pitches and tars, mostly from back half catch of EPA Method 5. Tests reported in Reference 20 indicate that condensible hydrocarbons account for 4% of total particulate weight.
[c]Based on fuel moisture content of about 50%.
[d]After control equipment, assuming an average collection efficiency of 80%. Data from References 4, 7 and 8 indicate that 50% flyash reinjection increases the dust load at the cyclone inlet 1.2 to 1.5 times, while 100% flyash reinjection increases the load 1.5 to 2 times the load without reinjection.
[e]Based on fuel moisture content of 33%.
[f]Based on large dutch ovens and spreader stokers (averaging 23,430 kg steam/hr) with steam pressures from 20 - 75 kpa (140 - 530 PSI).
[g]Based on small dutch ovens and spreader stokers (usually operating <9075 kg steam/hr), with pressures from 5 - 30 kpa (35 - 230 PSI). Careful air adjustments and improved fuel separation and firing were used on some units, but the effects cannot be isolated.
[h]References 12-13, 19, 27. Wood waste includes cuttings, shavings, sawdust and chips, but not bark. Moisture content ranges from 3 - 50% by weight. Based on small units (<3000 kg steam/hr) in New York and North Carolina.
[i]Reference 23. Based on tests of fuel sulfur content and sulfur dioxide emissions at four mills burning bark. The lower limit of the range (in parentheses) should be used for wood, and higher values for bark. A heating value of 5000 kcal/kg (9000 BTU/lb) is assumed. The factors are based on the dry weight of fuel.
[j]References 7, 24-26. Several factors can influence emission rates, including combustion zone, temperatures, excess air, boiler operating conditions, fuel moisture and fuel nitrogen content.
[k]Reference 30.
[l]References 20, 30. Nonmethane VOC reportedly consists of compounds with a high vapor pressure such as alpha pinene.
[m]Reference 30. Based on an approximation of methane/nonmethane ratio, which is very variable. Methane, expressed as a percent of total volatile organic compounds, varied from 0 - 74 weight %.

a tenfold increase in the dust loadings of some systems, although increases of 1.2 to 2 times are more typical for boilers using 50 to 100 percent reinjection. A major factor affecting this dust loading increase is the extent to which the sand and other noncombustibles can successfully be separated from the flyash before reinjection to the furnace.

Although reinjection increases boiler efficiency from 1 to 4 percent and minimizes the emissions of uncombusted carbon, it also increases boiler maintenance requirements, decreases average flyash particle size and makes collection more difficult. Properly designed reinjection systems should separate sand and char from the exhaust gases, to reinject the larger carbon particles to the furnace and to divert the fine sand particles to the ash disposal system.

Several factors can influence emissions, such as boiler size and type, design features, age, load factors, wood species and operating procedures. In addition, wood is often cofired with other fuels. The effect of these factors on emissions is difficult to quantify. It is best to refer to the references for further information.

The use of multitube cyclone mechanical collectors provides the particulate control for many hogged boilers. Usually, two multicyclones are used in series, allowing the first collector to remove the bulk of the dust and the second collector to remove smaller particles. The collection efficiency for this arrangement is from 65 to 95 percent. Low pressure drop scrubbers and fabric filters have been used extensively for many years. On the West Coast, pulse jets have been used.

Emission factors for wood waste boilers are presented in Table 1.6-1.

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ncasi technical bulletin

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC., 260 MADISON AVENUE, NEW YORK, N.Y. 10016

A STUDY OF WOOD-RESIDUE FIRED POWER BOILER TOTAL GASEOUS NON-METHANE ORGANIC EMISSIONS IN THE PACIFIC NORTHWEST

ATMOSPHERIC QUALITY IMPROVEMENT
TECHNICAL BULLETIN No. 109

SEPTEMBER 1980

A. TGNMO Emissions from Boilers Sampled

TGNMO as methane, carbon monoxide, and other pertinent data for duplicated samples are shown in Table 6. The average uncorrected TGNMO's for each boiler was 0.12, 0.07, 0.09 and 0.05 lb as methane/10^6 Btu fired for boilers A through D respectively. Little or no ethane or ethylene were found in the samples.

During the early part of the work on wood-residue fired boilers, water collected in the burnout moisture removal trap was not measured. Calculation of an estimate of the CO_2 absorption interference for each piece of data could not be performed. Interference estimates were calculated for each source with the data that was available for that source. Wood-residue boilers C and D had complete information for estimating the CO_2 interference. Average corrections for the boilers were 0.016, 0.015, 0.014, and 0.015 lb/10^6 Btu representing a corrected TGNMO contribution of 0.10, 0.05, 0.07, and 0.04 lb/10^6 Btu for boilers A through D respectively.

The average 1 hour geometric mean of the carbon monoxide values were 0.90, 0.20, 2.52 and 0.22 lb/10^6 Btu were found to be log normal distributed. All analytical data generated is presented in Appendix B.

B. Precision

Two factors must be accounted for when considering the precision of this data. The hidden variation in the carbon dioxide interference correction factor and the variation found between the duplicate samples. It is difficult to predict the uncertainty contribution due to application of the interference factor because of the large variation in the data producing the correction factor. At best the correction factor variation is plus or minus the correction factor. The variation in the interference factor need not be considered when working with uncorrected data.

The precision of the data as indicated by duplicate samples is obtained from an analysis of variance. Results of analysis of variance on uncorrected lb/10^6 Btu data is shown in Table 7.

TABLE 7 ANALYSIS OF VARIANCE RESULTS

Boiler	n	S Sample	S Error	MSR	F	Significant?	95% Confidence About Average
A	12	0.066	0.019	28.9	2.8	yes	0.043
B	8	0.021	0.021	2.9	2.8	no	0.025
C	7	0.018	0.026	3.2	4.3	no	0.032
D	8	0.005	0.011	1.4	3.8	no	0.010

TABLE 6 WOOD RESIDUE FIRED BOILER TGNMO DATA

TGNMO as CH_4		CO as CO		Stack O_2	Stack Moisture	Average Steam Production
$lb/10^6$ Btu	ppm	$lb/10^6$ Btu	ppm	%	%	lb/hr
Boiler A						
0.06	100	3.25	3000	7.5	-	145,000
0.19	190	3.03	1750	11.2	-	75,000
0.22	310	-	3050	10.5	-	125,000
0.18	190	1.20	740	11.5	-	130,000
0.10	140	0.64	640	7.3	12.3	135,000
0.14	210	0.31	260	7.8	25.3	100,000
0.08	100	0.38	300	8.4	17.4	100,000
0.05	76	2.16	2230	8.0	11.7	130,000
0.21	316	1.45	5610	7.0	15.3	130,000
0.04	53	0.42	350	9.0	16.0	140,000
0.06	63	0.66	410	8.6	16.3	100,000
0.06	75	1.50	1010	11.5	12.6	105,000
Boiler B						
0.03	79	0.042	48	6.0	16.6	300,000
0.10	180	0.091	97	6.8	15.3	350,000
0.09	120	0.417	641	5.4	-	475,000
0.08	100	0	0	9.5	20.9	350,000
0.07	60	0.604	273	12.5	7.0	250,000
0.04	30	0.539	255	11.6	10.6	250,000
0.04	40	0.249	156	7.8	13.9	410,000
0.07	80	0.110	70	7.8	12.3	420,000
Boiler C						
0.06	61	1.44	900	11.0	9.7	100,000
0.14	116	4.00	1900	12.1	15.0	80,000
0.08	74	2.92	1570	11.6	15.5	90,000
0.08	84	2.99	1460	11.3	15.9	100,000
0.08	77	2.71	1640	12.0	12.0	110,000
0.08	84	2.29	1420	11.3	16.8	100,000
Boiler D						
0.03	41	0.117	87	8.9	13.9	300,000
0.05	70	0.151	116	8.9	13.3	300,000
0.05	78	0.224	217	7.4	17.7	340,000
0.04	71	0.144	148	7.2	18.7	350,000
0.06	99	0.242	230	6.6	13.9	350,000
0.06	84	0.291	252	8.8	13.3	340,000
0.04	61	0.243	212	9.3	19.4	300,000
0.05	71	0.537	410	10.2	11.9	275,000

REFERENCES FOR MERCURY, BERYLLIUM, FLUORIDES AND SULFURIC ACID MIST EMISSIONS FROM FUEL OIL COMBUSTION

CCEA SPECIAL REPORT

EPA-450/2-80-074

Health Impacts, Emissions, and Emission Factors for Noncriteria Pollutants Subject to De Minimis Guidelines and Emitted from Stationary Conventional Combustion Processes

by

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TABLE 4-3 TRACE ELEMENT EMISSION FACTORS FOR OIL-FIRED AND GAS-FIRED UTILITY AND INDUSTRIAL BOILERS

FURNACE TYPE	RESIDUAL OIL[a] pg/J			NATURAL GAS[b] pg/J		
	Hg	Be	F	Hg	Be	F
UNCONTROLLED[c]						
Tangential firing	23C	24C	23C	4.9	Nil	Nil
Wall firing	23C	24C	23C	4.9	Nil	Nil

(a) Emission factors for residual oil are calculated based on characterization of eleven residual oil samples and the assumption that all trace elements in the oil feed are emitted through the stack (Shih, et al, October 1979). C indicates the concentration of trace element in residual oil, in ppm.

(b) Based on stack test measurements for gas-fired utility boilers (1.).

(c) When boilers are equipped with wet scrubbers (used for flue gas desulfurization), the emission factor for Be may be assumed to be 0.01 times the uncontrolled factor given above, and emissions of Hg and F are .2 times the values given above (1.).

NOTE: To convert emission factor units to $LB/10^{12}BTU$, multiply factors by 2.33.

TABLE 4-6. EMISSION FACTORS FOR SULFURIC ACID MIST FROM COMBUSTION SOURCES

SOURCE	Percent of fuel Sulfur in H_2SO_4	Emission Factor[a] ng/J	Information Sources (Reference no.)
UNCONTROLLED [b]			
EXTERNAL COMBUSTION			
Bituminous coal-fired utility boilers	.74	8.8S	58,22,2,14,56
Oil-fired utility boilers	2.4	16.9S	59,58,56
INTERNAL COMBUSTION			
Distillate oil-fueled gas turbine	3.8	1.5	60,61
Distillate oil-fueled reciprocating engine	1.4	8.9S	62,57
Gas-fueled internal combustion	Nil	Nil	57

(a) Some emission factors are presented in terms of S, the percent sulfur in the fuel. The limited data base for distillate oil-fueled gas turbines did not permit the expression of emission rates in terms of fuel sulfur concentration.

(b) For controlled emission rates, multiply uncontrolled levels above by 0.50 when flue gas desulfurization units are used, 1.0 when cold side ESPs or mechanical precipitators are used, and 2.4 when hot side ESPs are used (63, 64, 65, 67, 68),

NOTE: To convert emission factor units to LB/10^{12}BTU, multiply factor by ~~2.33~~. 2326 per calculation see pg. 55

PB81-145195

EPA-600/7-81-003a
November 1980

EMISSIONS ASSESSMENT OF CONVENTIONAL STATIONARY COMBUSTION SYSTEMS: VOLUME III. EXTERNAL COMBUSTION SOURCES FOR ELECTRICITY GENERATION

November 1980

by:

C.C. Shih, R.A. Orsini, D.G. Ackerman, R. Moreno,
E.L. Moon, L.L. Scinto, and C. Yu

TRW Environmental Engineering Division
One Space Park, Redondo Beach, CA 90278

EPA Contract No.: 68-02-2197
EPA Program Element No.: C9K N1C
Project Officer: Michael C. Osborne

Industrial Environmental Research Laboratory
Office of Environmental Engineering and Technology
Research Triangle Park, N.C. 27711

Prepared for:

U.S. Environmental Protection Agency
Office of Research and Development
Washington D.C. 20545

TABLE 70. AVERAGE TRACE ELEMENT CONCENTRATIONS OF RESIDUAL OIL

Trace Element	Concentration, ppm	Trace Element	Concentration, ppm
Vanadium	160	Gallium	0.4
Nickel	42.2	Indium	0.3
Potassium	34	Silver	0.3
Sodium	31	Germanium	0.2
Iron	18	Thallium	0.2
Silicon	17.5	Zirconium	0.2
Calcium	14	Strontium	0.15
Magnesium	13	Bromine	0.13
Chlorine	12	Fluorine	0.12
Tin	6.2	Ruthenium	0.10
Aluminum	3.8	Tellurium	0.1
Lead	3.5	Cesium	0.09
Copper	2.8	Beryllium	0.08
Cadmium	2.27	Iodine	0.06
Cobalt	2.21	Lithium	0.06
Rubidium	2	Mercury	0.04
Titanium	1.8	Tantalum	0.04
Manganese	1.33	Rhodium	0.03
Chromium	1.3	Gold	0.02
Barium	1.26	Platinum	0.02
Zinc	1.26	Scandium	0.02
Phosphorus	1.1	Bismuth	0.01
Molybdenum	0.90	Cerium	0.006
Arsenic	0.8	Tungsten	0.004
Selenium	0.7	Hafnium	0.003
Uranium	0.7	Yttrium	0.002
Antimony	0.44	Niobium	0.001
Boron	0.41		

Source: Reference 108.

REFERENCES FOR ARSENIC AND LEAD EMISSIONS
FROM FUEL OIL BURNING

PB81-145195

EPA-600/7-81-003a
November 1980

EMISSIONS ASSESSMENT OF CONVENTIONAL STATIONARY COMBUSTION SYSTEMS: VOLUME III. EXTERNAL COMBUSTION SOURCES FOR ELECTRICITY GENERATION

November 1980

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Research Triangle Park, N.C. 27711

Prepared for:

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Washington D.C. 20545

TABLE 71. EMISSION FACTORS AND MEAN SOURCE SEVERITIES OF TRACE ELEMENT EMISSIONS FROM OIL-FIRED UTILITY BOILERS

Trace Element	Concentration, ppm	Emission Factor, pg/J	Mean Severity Factor: Tangentially-fired Boilers	Mean Severity Factor: Wall-fired Boilers
Aluminum (Al)	3.8	87	0.0074	0.0027
Arsenic (As)	0.8	18	0.016	0.0059
Boron (B)	0.41	9.4	0.0013	0.0005
Barium (Ba)	1.26	28.8	0.025	0.0094
Beryllium (Be)	0.08	1.8	0.40	0.15
Bromine (Br)	0.13	3.0	0.0001	<0.0001
Calcium (Ca)	14	320	0.014	0.0052
Cadmium (Cd)	2.27	51.9	0.11	0.042
Chlorine (Cl)	12	274	0.018	0.0066
Cobalt (Co)	2.21	50.5	0.22	0.082
Chromium (Cr)	1.3	30	0.026	0.0098
Copper (Cu)	2.8	64	0.14	0.052
Fluorine (F)	0.12	2.7	0.0005	0.0002
Iron (Fe)	18	411	0.023	0.0086
Mercury (Hg)	0.04	0.9	0.0079	0.0029
Potassium (K)	34	777	0.0064	0.0024
Lithium (Li)	0.06	1.4	0.028	0.010
Magnesium (Mg)	13	297	0.022	0.0081
Manganese (Mn)	1.33	30.4	0.0027	0.0010
Molybdenum (Mo)	0.9	21	0.0018	0.0007
Sodium (Na)	31	708	0.0059	0.0022
Nickel (Ni)	42.2	964	4.2	1.6
Phosphorus (P)	1.1	25	0.11	0.041
Lead (Pb)	3.5	80	0.23	0.087
Antimony (Sb)	0.44	10	0.0088	0.0033
Selenium (Se)	0.7	16	0.035	0.013
Silicon (Si)	17.5	400	0.018	0.0065
Tin (Sn)	6.2	142	0.031	0.012
Strontium (Sr)	0.15	3.4	0.0005	0.0002
Thorium (Th)	<0.001	<0.02	<0.0001	<0.0001
Uranium (U)	0.7	16	0.035	0.013
Vanadium (V)	160	3656	3.2	1.2
Zinc (Zn)	1.26	28.8	0.0032	0.0012

APPENDIX H

ESTIMATION OF CURRENT CLEWISTON MILL EMISSIONS

APPENDIX H

ESTIMATION OF CURRENT CLEWISTON MILL EMISSIONS

I. BAGASSE

Total burned (average 1981-1982) = 375,711 tons (wet)

Assumed sulfur content = 0.002

Heating value = 8,000 Btu/lb (dry)

Moisture content = 52.2 percent

Dry bagasse burned = 375,711 x (1 - 0.522) = 179,590 tons

Total heat input = 179,590 x 2,000 x 8,000 = 2.873 x 10^{12} Btu

PM @ allowables = 0.3 lb/10^6 Btu x 2.873 x 10^{12} Btu ÷ 2,000 = 431.0 tons/yr

SO_2: Assumes 50-percent efficiency in scrubbers
179,590 tons x 0.002 x 2 x 0.5 = 359.2 tons/yr

NO_x: 375,711 tons (wet) x 1.2 lb/ton ÷ 2,000 = 225.4 tons/yr

CO: 0.25 lb/10^6 Btu x 2.873 x 10^{12} Btu ÷ 2,000 = 359.1 tons/yr

VOC: 375,711 x 1.7 lb/ton ÷ 2,000 = 319.4 tons/yr

II. FUEL OIL

Total burned (average 1981-1982) = 378,050 gallons

Sulfur content = 2.4 percent

Density = 8.2 lb/gal

Heating value = 18,300 Btu/lb

Total heat input = 378,050 x 8.2 x 18,300 = 5.673 x 10^{10} Btu

PM @ allowables = 0.1 lb/10^6 Btu x 5.673 x 10^{10} Btu ÷ 2,000 = 2.8 tons/yr

SO_2: 378,050 x 8.2 x 0.024 x 2 ÷ 2,000 = 74.4 tons/yr

NO_x: 378,050 x 67/10^3 ÷ 2,000 = 12.7 tons/yr

CO: 378,050 x 5/10^3 ÷ 2,000 = 0.9 tons/yr

VOC: 378,050 x 1.04/10^3 ÷ 2,000 = 0.2 tons/yr

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

ANNUAL OPERATIONS REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 81 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: UNITED STATES SUGAR CORPORATION - CLEWISTON SUGAR MILL
2. Permit Number: AO26-7065
3. Source Address: P. O. Drawer 1207
   Clewiston, Florida 33440
4. Description of Source: Bagasse Fired Boiler No. 1 - Clewiston

II OPERATING SCHEDULE: 24 hrs/day 7 days/wk 17.1 wks/yr

III RAW MATERIAL INPUT PROCESS WEIGHT:

Raw Material	Input Process Weight	
Steam	320,390	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV TOTAL FUEL USAGE, *including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1 % S).*

_____ 10^6 cubic feet Natural Gas — 174.6 10^3 gallons No. 6 Oil, 2.4 %S

_____ 10^3 gallons Propane — _____ 10^3 gallons Kerosene

_____ tons Coal — _____ 10^6 lb Black Liquid Solids

_____ tons Carbonaceous — _____ tons Refuse

Other (Specify type and units) Bagasse 145,040 Tons/year (52.33% Moisture)

V EMISSION LEVEL (tons/yr):

A. 129.40 Particulates _____ Sulfur Dioxide _____ Total Reduced Sulfur

_____ Nitrogen Oxide _____ Carbon Monoxide _____ Fluoride

_____ Hydrocarbon Other (Specify type and units) _____

B. Method of calculating emission rates (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

VI CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

A. R. Mayo

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

A. R. Mayo, Vice President, Sugar Houses

TYPED NAME AND TITLE

A. R. Mayo

March 17, 1982

DATE

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

ANNUAL OPERATIONS REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 81 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: UNITED STATES SUGAR CORPORATION - CLEWISTON SUGAR MILL
2. Permit Number: A026-7251
3. Source Address: P. O. Drawer 1207
   Clewiston, Florida 33440
4. Description of Source: Bagasse Fired Boiler No. 2 - Clewiston

II OPERATING SCHEDULE: 24 hrs/day 7 days/wk 17.1 wks/yr

III RAW MATERIAL INPUT PROCESS WEIGHT:

Raw Material	Input Process Weight	
Steam	269,750.	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV TOTAL FUEL USAGE, including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1 % S).

_____ 10^6 cubic feet Natural Gas   176.7 10^3 gallons No. 6 Oil, 2.4 %S

_____ 10^3 gallons Propane   _____ 10^3 gallons Kerosene

_____ tons Coal   _____ 10^6 lb Black Liquid Solids

_____ tons Carbonaceous   _____ tons Refuse

Other (Specify type and units) Bagasse 122,115 Tons/Yr. (52.33 Moisture)

V EMISSION LEVEL (tons/yr):

A. 90.47 Particulates   _____ Sulfur Dioxide   _____ Total Reduced Sulfur

_____ Nitrogen Oxide   _____ Carbon Monoxide   _____ Fluoride

_____ Hydrocarbon   Other (Specify type and units) _____

B. Method of calculating emission rates (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

VI CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

A. R. Mayo   A. R. Mayo, Vice President, Sugar Houses

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE   TYPED NAME AND TITLE

A. R. Mayo

March 17, 1982
DATE

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

ANNUAL OPERATIONS REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 81 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: UNITED STATES SUGAR CORPORATION - CLEWISTON SUGAR MILL
2. Permit Number: A026-7250
3. Source Address: P. O. Drawer 1207
   Clewiston, Florida 33440
4. Description of Source: Bagasse Fired Boiler No. 3 - Clewiston

II OPERATING SCHEDULE: 24 hrs/day 7 days/wk 17.1 wks/yr

III RAW MATERIAL INPUT PROCESS WEIGHT:

Raw Material	Input Process Weight	
Steam	147,251.	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV TOTAL FUEL USAGE, including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1 % S).

____ 10^6 cubic feet Natural Gas	113.3 10^3 gallons No. 6 Oil, 2.4 %S
____ 10^3 gallons Propane	____ 10^3 gallons Kerosene
____ tons Coal	____ 10^6 lb Black Liquid Solids
____ tons Carbonaceous	____ tons Refuse

Other (Specify type and units) Bagasse 66,660. Tons/Yr. (52.33% Moisture)

V EMISSION LEVEL (tons/yr):

A. 54.53 Particulates ____ Sulfur Dioxide ____ Total Reduced Sulfur
____ Nitrogen Oxide ____ Carbon Monoxide ____ Fluoride
____ Hydrocarbon Other (Specify type and units) ____

B. Method of calculating emission rates (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

VI CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

A. R. Mayo
SIGNATURE OF OWNER/OR AUTHORIZED REPRESENTATIVE

A. R. Mayo, Vice President, Sugar Houses
TYPED NAME AND TITLE

A. R. Mayo

March 17, 1982
DATE

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

ANNUAL OPERATIONS REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 81 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: UNITED STATES SUGAR CORPORATION - CLEWISTON SUGAR MILL
2. Permit Number: A026-5069
3. Source Address: P. O. Drawer 1207
   Clewiston, Florida 33440
4. Description of Source: Bagasse Fired Boiler No. 5

II OPERATING SCHEDULE: 24 hrs/day 7 days/wk 17.1 wks/yr

III RAW MATERIAL INPUT PROCESS WEIGHT:

Raw Material	Input Process Weight	
Steam	69,412.	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV TOTAL FUEL USAGE, including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1 % S).

_____ 10^6 cubic feet Natural Gas _____ 10^3 gallons _____ Oil, _____ %S

_____ 10^3 gallons Propane _____ 10^3 gallons Kerosene

_____ tons Coal _____ 10^6 lb Black Liquid Solids

_____ tons Carbonaceous _____ tons Refuse

Other (Specify type and units) Bagasse 31,423. Tons/Yr. (52.33% Moisture)

V EMISSION LEVEL (tons/yr):

A. 44.99 Particulates _____ Sulfur Dioxide _____ Total Reduced Sulfur

_____ Nitrogen Oxide _____ Carbon Monoxide _____ Fluoride

_____ Hydrocarbon Other (Specify type and units) _____

B. Method of calculating emission rates (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

VI CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

A. R. Mayo

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

A. R. Mayo, Vice President, Sugar Houses

TYPED NAME AND TITLE

A. R. Mayo

March 17, 1982

DATE

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

ANNUAL OPERATIONS REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 81 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: UNITED STATES SUGAR CORPORATION - CLEWISTON SUGAR MILL
2. Permit Number: A026-7626
3. Source Address: P. O. Drawer 1207
   Clewiston, Florida 33440
4. Description of Source: Bagasse Fired Boiler No. 6

II OPERATING SCHEDULE: 24 hrs/day 7 days/wk 17.1 wks/yr

III RAW MATERIAL INPUT PROCESS WEIGHT:

Raw Material	Input Process Weight	
~~Steam~~	70,646	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV TOTAL FUEL USAGE, including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1 % S).

____ 10^6 cubic feet Natural Gas ____ 10^3 gallons ____ Oil, ____ %S

____ 10^3 gallons Propane ____ 10^3 gallons Kerosene

____ tons Coal ____ 10^6 lb Black Liquid Solids

____ tons Carbonaceous ____ tons Refuse

Other (Specify type and units) Bagasse 31,981 Tons/Yr. (52.33% Moisture)

V EMISSION LEVEL (tons/yr):

A. 48.55 Particulates ____ Sulfur Dioxide ____ Total Reduced Sulfur

____ Nitrogen Oxide ____ Carbon Monoxide ____ Fluoride

____ Hydrocarbon Other (Specify type and units) ____

B. Method of calculating emission rates (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

VI CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

G. R. Mayo
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

A. R. Mayo, Vice President, Sugar Houses
TYPED NAME AND TITLE

G. R. Mayo

March 17, 1982
DATE

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

ANNUAL OPERATIONS REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 82 ____ prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: United States Sugar Corporation - Clewiston Sugar Mill
2. Permit Number: A-026-7065
3. Source Address: P. O. Crawer 1207
   Clewiston, Florida 33440
4. Description of Source: Bagasse Fired Boiler No. 1 - Clewiston

II OPERATING SCHEDULE: 24 hrs/day 7 days/wk 17.4 wks/yr

III RAW MATERIAL INPUT PROCESS WEIGHT:

Raw Material	Input Process Weight	
Steam	284,322	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV TOTAL FUEL USAGE, including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1 % S).

____ 10^6 cubic feet Natural Gas
137.3 10^3 gallons No. 6 Oil, 2.4 %S
____ 10^3 gallons Propane
____ 10^3 gallons Kerosene
____ tons Coal
____ 10^6 lb Black Liquid Solids
____ tons Carbonaceous
____ tons Refuse

Other (Specify type and units) Bagasse 129,508 Tons/Year (51.98% Moisture)

V EMISSION LEVEL (tons/yr):

A. 116.9 Particulates ____ Sulfur Dioxide ____ Total Reduced Sulfur
____ Nitrogen Oxide ____ Carbon Monoxide ____ Fluoride
____ Hydrocarbon Other (Specify type and units) ____

B. Method of calculating emission rates (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

VI CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

A. R. Mayo
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

A. R. Mayo, Vice President - Sugar Hous
TYPED NAME AND TITLE

January 28, 1983
DATE

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

ANNUAL OPERATIONS REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 82 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: United States Sugar Corporation - Clewiston Sugar Mill
2. Permit Number: A-026-7251
3. Source Address: P. O. Drawer 1207
   Clewiston, Florida 33440
4. Description of Source: Bagasse Fired Boiler No. 2 - Clewiston

II OPERATING SCHEDULE: 24 hrs/day 7 days/wk 17 wks/yr

III RAW MATERIAL INPUT PROCESS WEIGHT:

Raw Material	Input Process Weight	
Steam	257,659	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV TOTAL FUEL USAGE, including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1 % S).

_____ 10^6 cubic feet Natural Gas
78.1 10^3 gallons No. 6 Oil, 2.4 %S
_____ 10^3 gallons Propane
_____ 10^3 gallons Kerosene
_____ tons Coal
_____ 10^6 lb Black Liquid Solids
_____ tons Carbonaceous
_____ tons Refuse

Other (Specify type and units) Bagasse 117,477 Tons/Year (51.98% Moisture)

V EMISSION LEVEL (tons/yr):

A. 79.8 Particulates _____ Sulfur Dioxide _____ Total Reduced Sulfur
_____ Nitrogen Oxide _____ Carbon Monoxide _____ Fluoride
_____ Hydrocarbon Other (Specify type and units) _____

B. Method of calculating emission rates (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

VI CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

A. R. Mayo
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

A. R. Mayo, Vice President, Sugar House
TYPED NAME AND TITLE

January 28, 1983
DATE

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

ANNUAL OPERATIONS REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 1982 ____ prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: United States Sugar Corporation - Clewiston Sugar Mill
2. Permit Number: A-026-7250
3. Source Address: P. O. Drawer 1207
   Clewiston, Florida 33440
4. Description of Source: Bagasse Fired Boiler No. 3 - Clewiston

II OPERATING SCHEDULE: 24 hrs/day 7 days/wk 17.3 wks/yr

III RAW MATERIAL INPUT PROCESS WEIGHT:

Raw Material	Input Process Weight	
Steam	143,465	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV TOTAL FUEL USAGE, including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1 % S).

____ 10^6 cubic feet Natural Gas — 76.1 10^3 gallons No. 6 Oil, 2.4 %S
____ 10^3 gallons Propane — ____ 10^3 gallons Kerosene
____ tons Coal — ____ 10^6 lb Black Liquid Solids
____ tons Carbonaceous — ____ tons Refuse

Other (Specify type and units) Bagasse 65,462 Tons/Year (51.98% Moisture)

V EMISSION LEVEL (tons/yr):

A. 52.2 Particulates — ____ Sulfur Dioxide — ____ Total Reduced Sulfur
____ Nitrogen Oxide — ____ Carbon Monoxide — ____ Fluoride
____ Hydrocarbon — Other (Specify type and units) ____

B. Method of calculating emission rates (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

VI CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

A. R. Mayo
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

A. R. Mayo, Vice President - Sugar House
TYPED NAME AND TITLE

January 28, 1983
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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

ANNUAL OPERATIONS REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 82 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: United States Sugar Corporation - Clewiston Sugar Mill
2. Permit Number: A-026-5069
3. Source Address: P. O. Drawer 1207
Clewiston, Florida 33440
4. Description of Source: Bagasse Fired Boiler No. 5 - Clewiston

II OPERATING SCHEDULE: 24 hrs/day 7 days/wk 16.7 wks/yr

III RAW MATERIAL INPUT PROCESS WEIGHT:

Raw Material	Input Process Weight	
Steam	62,984	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV TOTAL FUEL USAGE, including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1 % S).

_____ 10^6 cubic feet Natural Gas _____ 10^3 gallons _____ Oil, _____ %S

_____ 10^3 gallons Propane _____ 10^3 gallons Kerosene

_____ tons Coal _____ 10^6 lb Black Liquid Solids

_____ tons Carbonaceous _____ tons Refuse

Other (Specify type and units) Bagasse 28,662 Tons/Year (51.98% Moisture)

V EMISSION LEVEL (tons/yr):

A. 26.4 Particulates _____ Sulfur Dioxide _____ Total Reduced Sulfur

_____ Nitrogen Oxide _____ Carbon Monoxide _____ Fluoride

_____ Hydrocarbon Other (Specify type and units) _____

B. Method of calculating emission rates (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

VI CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

A. R. Mayo
SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

A. R. Mayo, Vice President - Sugar Hous
TYPED NAME AND TITLE

January 28, 1983
DATE

DER FORM 17-1.122(44) Page 1 of 1

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

ANNUAL OPERATIONS REPORT FORM FOR AIR EMISSIONS SOURCES

For each permitted emission point, please submit a separate report for calendar year 19 82 prior to March 1st of the following year.

I GENERAL INFORMATION

1. Source Name: United States Sugar Corporation - Clewiston Sugar Mill
2. Permit Number: AO-26-7626
3. Source Address: P. O. Drawer 1207
   Clewiston, Florida 33440
4. Description of Source: Bagasse Fired Boiler No. 6 - Clewiston

II OPERATING SCHEDULE: 24 hrs/day 7 days/wk 8.7 wks/yr

III RAW MATERIAL INPUT PROCESS WEIGHT:

Raw Material	Input Process Weight	
Steam	28,749	tons/yr
		tons/yr
		tons/yr
		tons/yr
		tons/yr

IV TOTAL FUEL USAGE, including standby fuels. If fuel is oil, specify type and sulfur content (e.g., No. 6 oil with 1 % S).

_____ 10^6 cubic feet Natural Gas _____ 10^3 gallons _____ Oil, _____ %S

_____ 10^3 gallons Propane _____ 10^3 gallons Kerosene

_____ tons Coal _____ 10^6 lb Black Liquid Solids

_____ tons Carbonaceous _____ tons Refuse

Other (Specify type and units) Bagasse 13,092 Tons/Year (51.98% Moisture)

V EMISSION LEVEL (tons/yr):

A. 12.6 Particulates _____ Sulfur Dioxide _____ Total Reduced Sulfur

_____ Nitrogen Oxide _____ Carbon Monoxide _____ Fluoride

_____ Hydrocarbon Other (Specify type and units) _____

B. Method of calculating emission rates (e.g., use of fuel and materials balance, emission factors drawn from AP 42, etc.)

VI CERTIFICATION:

I hereby certify that the information given in this report is correct to the best of my knowledge.

A. R. Mayo

SIGNATURE OF OWNER OR AUTHORIZED REPRESENTATIVE

A. R. Mayo, Vice President - Sugar Hous

TYPED NAME AND TITLE

January 28, 1983

DATE

DER FORM 17-1.122(44) Page 1 of 1

APPENDIX I

EAST AND WEST PELLET PLANTS--CALCULATION OF EMISSION OFFSETS

APPENDIX I

EAST AND WEST PELLET PLANTS--CALCULATION OF EMISSION OFFSETS

PARTICULATES

East Pellet Plant--Based upon last two source tests on units

Source test of 2-13-80

Actual emissions = 10.8 lb/hr

Pellet production = 8,317 lb/hr = 4.1585 tons/hr

Emission factor = 2.60 lb/ton

Source test of 3-12-81

Actual emissions = 10.53 lb/hr

Pellet production = 6,765 lb/hr = 3.3825 tons/hr

Emission factor = 3.11 lb/ton

West Pellet Plant--

Source test of 1-16-79

Actual emissions = 8.65 lb/hr

Pellet production = 17,030 lb/hr = 8.515 tons/hr

Emission factor = 1.02 lb/ton

Source test of 2-18-80

Actual emissions = 15.58 lb/hr

Pellet production = 10,731 lb/hr = 5.3655 tons/hr

Emission factor = 2.90 lb/ton

Average of four stack tests = 2.41 lb/ton

Total pellet production (average 1980-1981) = (2,313 + 6,895) ÷ 2 = 4,604 tons

PM emissions = 4,604 x 2.41 ÷ 2,000 = 5.5 tons/yr

OTHER POLLUTANTS

Emissions due to fuel oil burning

Total burned (average 1980-1981) = (48,303 + 134,576) ÷ 2 = 91,440 gallons

Sulfur content = 2.4 percent

SO_2: 91,440 x 8.2 x 0.024 x 2 ÷ 2,000 = 18.0 tons/yr

NO_x: 91,440 x $67/10^3$ ÷ 2,000 = 3.1 tons/yr

CO: 91,440 x $5/10^3$ ÷ 2,000 = 0.2 tons/yr

VOC: 91,440 x $1.04/10^3$ ÷ 2,000 = 0.05 tons/yr

UNITED STATES SUGAR CORPORATION

P. O. Drawer 1207

CLEWISTON, FLORIDA 33440

November 18, 1983

Mr. David Buff
Environmental Science and Engineering
P. O. Box 13454
Gainesville, Fl. 32604

Dear Mr. Buff:

As per Mr. A. R. Mayo's request, attached please find copies of the stack test for Clewiston and Bryant boilers for the last five years showing average stack temperature.

The following is a list of the production and oil consumption for the last three years of operation of the pellet plant:

	1981	1980	1979
Pellet production maximum daily	248.5 tons	264.4 tons	118.2 tons
Total production	2,312.9 tons	6,894.7 tons	2,270.5 tons
Fuel oil consumption maximum daily	4,339 gals	4,799 gals	3,140 gals
Total fuel oil consumption	48,303 gals	134,576 gals	55,539 gals

If I can be of any further assistance or you need any other information, please do not hesitate to let me know.

Sincerely,

UNITED STATES SUGAR CORPORATION

Magin Perez

Magín Perez
Supervisor, Engineering Design

MP:jt
Enclosures

APPENDIX J

FLORIDA SUGAR CANE LEAGUE TSP MONITORING DATA

Best Available Copy

RY → DEO → DAB

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

RECEIVED
SEP 13 1982
FLORIDA SUGAR CANE LEAGUE

September 7, 1982

Mr. David A. Bare
Director of Environmental
Relations
Florida Sugar Cane League,
Inc.
P. O. Box 1148
Clewiston, Florida 33440

Dear Mr. Bare:

Reference: Florida Sugar Cane League; Quality Assurance Plan for Ambient Air Network, 6/82 as amended.

Review of the subject document has been completed by my staff. The document, as amended, meets the requirements for quality assurance activities needed to produce acceptable ambient air quality data in support of Prevention of Significant Deterioration (PSD) monitoring requirements.

Please post this letter with the referenced document as the final approval notice.

Please feel free to contact this office at any time if you have further questions or comments.

Sincerely,

David R. Barker, Ph. D.
Environmental Administrator
Quality Assurance Section
Bureau of Air Quality Management

DRB:RJA:ht

cc: R. J. Arbes
C. Holladay

HI-VOL STATION # 7

FLORIDA SUGAR CANE LEAGUE, INC.

HI-VOL DATA SHEET

	DATE	TARE WT.	FINAL WT.	SAMPLE WT.	OBSERVED FLOW	TRUE FLOW	TOTAL VOL. M^3	MG/M^3	
	10-2-82	3.5001	3.5791	.0790	45.5	44.5	1816	44	
	10-8-82	3.4601	3.5333	.0732	46	45	1836	40	
	10-14-82	3.4984	3.6040	.1056	46.5	46	1877	56	
	10-20-82	3.4788	3.5423	.0635	46.5	46	1877	34	
	10-26-82	3.4451	3.5103	.0652	48.5	49	1999	33	
	11-1-82	3.5471	3.6331	.0860	46.5	46	1877	46	
	11-7-82	3.5144	3.5825	.0684 corrected .0681	47.5	47.5	1938	35	23.88 h
	11-13-82	3.5600	3.6548	.0953 corrected .0948	47.5	47.5	1938	49	23.86 h
	11-19-82	3.5151	3.5866	.0719 .0715	47	46.5	1897	38	23.88
	11-25-82	3.5344	3.6332	.0992 .0988	47.5	47.5	1938	51	23.90
	12-1-82	3.5555	3.6578	.1026 .1023	46.5	46	1877	55	23.72
*	12-7-82	3.4891	3.5938	.1051 .1047	47.5	44	1795	59	23.90
	12-13-82	3.5116	3.6002	.0891 .0886	49.5	47.5	1938	46	23.87
	12-19-82	3.5154	3.6040	.0886	50	48	1958	45	
	12-25-82	3.4653							23.88
	12-31-82	3.4127	3.5099	.0976 .0972	48	45	1836	53	23.90

* NEW CALIBRATION

Best Available Copy

HI-VOL STATION # 7

FLORIDA SUGAR CANE LEAGUE, INC.

HI-VOL DATA SHEET

DATE	TARE WT.	FINAL WT.	SAMPLE WT.	OBSERVED FLOW	TRUE FLOW	TOTAL VOL. M^3	MG/M^3	
1-6-83	3.4653	3.5503	.0854 .0850	50	48	1958	44	23.90
1-12-83	3.4115	3.5002	.0892 .0887	50	48	1958	46	23.87
1-18-83	3.3845	3.4918	.1077 .1073	50	48	1958	55	23.90
1-24-83	3.4197	3.5342	.1151 .1145	50.5	49	1999	58	23.88
1-30-83	3.4037	3.5334	.1304 .1297	50.5	49	1999	65	23.88
2-5-83	3.4090	3.5141	.1055 .1051	50.5	49	1999	53	23.92
2-11-83	3.3827	3.5528	.1710 .1701	50	48	1958	87	23.85
2-17-83	3.2685	3.3518	.0837 .0833	51	49.5	2020	41	23.88
2-23-83	3.3962	3.5222	.1266 .1260	48.5	46	1877	67	23.88
3-1-83	3.2923	3.3969	.1051 .1046	50	48	1958	54	23.88
3-7-83	3.4472	3.5236	.0764	48	45	1827 1836	42	23.88
3-13-83	3.4189	3.5119	.0930	49.5	47.5	1928	48	23.88
* 3-19-83	3.5954	3.7455	.1501	48	42	1705 1714	88	23.88
3-25-83	3.5046	3.5981	.0935	50	45	1828 1836	51	23.90
3-31-83	3.6028	3.6903	.0875	48.5	43	1746	50	23.98

* use new calibration

BEST AVAILABLE COPY

HI-VOL STATION # 7

FLORIDA SUGAR CANE LEAGUE, INC.

HI-VOL DATA SHEET

DATE	TARE WT.	FINAL WT.	SAMPLE WT.	OBSERVED FLOW	TRUE FLOW	TOTAL VOL. M3	MG/M3	
4-6-83	3.5036	3.5929	.0893	48.5	43	1746	51	23.88
4-12-83	3.4815	3.5861	.1046	50	45	1827	57	23.88
4-18-83	3.5746	3.7035	.1289	49	43.5	1767	73	23.90
4-24-83	3.5578	3.7579	.2001	49	43.5	1766	113	23.88
4-30-83	3.5047	3.6235	.1188	49	43.5	1766	67	23.88
5-6-83	3.4799	3.5644	.0845	49	[illegible]	1766	48	23.88
5-12-83	3.6335	3.7679	.1344	48	42	1704	79	23.87
5-18-83	3.6067	3.7154	.1087	48	42	1705	64	23.88
5-24-83	3.6784	3.7870	.1086	48	42	1705	64	23.88
5-30-83	3.5800	3.6201	.0401	48	42	1706	24	23.90
6-5-83	3.5584	3.6064	.0480	48	42	1705	28	23.88
* 6-11-83	3.6011	3.6576	.0565	48.5	45	1828	31	23.90
6-17-83	3.5530	3.6271	.0741	48	44.5	1809	41	23.88
6-23-83	3.4700	3.5352	.0652	48.5	45	1827	36	23.88
6-29-83	3.4973	3.5608	.0635	48	44.5	1806	35	23.87

* New Calibration

Best Available Copy

HI-VOL STATION # 7

FLORIDA SUGAR CANE LEAGUE, INC.

HI-VOL DATA SHEET

DATE	TARE WT.	FINAL WT.	SAMPLE WT.	OBSERVED FLOW	TRUE FLOW	TOTAL VOL. M^3	Mg/M^3	
7-5-83	3.3535	3.4143	.0608	49.5	46.5	1885	32	23.85
7-11-83	3.2898	3.3897	.0999	49.5	46.5	1887	53	23.87
7-17-83	3.3353	3.5304	.1951	48.5	45	1827	107	23.88
7-23-83	3.4819	3.6338	.1519	48	44.5	1807	84	23.88
7-29-83	3.4626	3.5352	.0726	48.5	45	1831	40	23.93
8-4-83	3.6220	3.7015	.0795	47	43	1749	45	23.93
8-10-83	3.6014	3.6738	.0724	47	43	1749	41	23.93
8-16-83	3.6139	3.6784	.0645	47.5	44	1789	36	23.92
8-22-83	3.6252	3.7373	.1121	47.5	44	1791	63	23.95
8-28-83	3.3169	3.4087	.0918	50	47.5	1932	48	23.93
9-3-83	3.4472	3.5162	.0690	48.5	45	1830	38	23.92
9-9-83	3.3536	3.4558	.1022	48.5	45	1830	56	23.92
* 9-15-83	3.4260	3.4789	.0529	48	44.5	1808	29	23.90
9-21-83	3.3891	3.4443	.0552	48.5	45.5	1850	30	23.92
9-27-83	3.6272	3.6923	.0651	48	44.5	1813	36	23.97

HI-VOL STATION # 7

FLORIDA SUGAR CANE LEAGUE, INC.

HI-VOL DATA SHEET

DATE	TARE WT.	FINAL WT.	SAMPLE WT.	OBSERVED FLOW	TRUE FLOW	TOTAL VOL. M3	MG/M^3	
10-3-83	3.5505	3.6023	.0518	47.5	44	1793	29	23.97
10-9-83	3.5649	3.6128	.0479	48	44.5	1810	26	23.93
10-15-83	3.5374	3.5940	.0566	48	44.5	1813	31	23.97
10-21-83	3.5220	3.5881	.0661	48	44.5	1810	37	23.93
10-27-83	3.6157	3.7117	.0960	48.5	45.5	1853	52	23.95
11-2-83	3.5732	3.6328	.0596	48	44.5	1810	33	23.92
11-8-83	3.5737	3.6221	.0484	48	44.5	1810	27	23.93
11-14-83	3.6241	3.7304	.1063	48.5	45.5	1851	57	23.93
11-20-83	3.5299	3.6402	.1103	48.5	45.5	1854	59	23.97
11-26-83	3.4106	3.4391	.0735	48.5	45.5	1851	42	23.93
* 12-2-83	3.3596	3.4492	.0896	47.5	45	1838	49	23.9
12-8-83	3.3862	3.4512	.0650	48.5	46.5	1891	34	23.92
12-14-83								
12-20-83								
12-26-83								

HI-VOL STATION # 19

FLORIDA SUGAR CANE LEAGUE, INC.

HI-VOL DATA SHEET

DATE	TARE WT.	FINAL WT.	SAMPLE WT.	OBSERVED FLOW	TRUE FLOW	TOTAL VOL. M3	MG/M3	
10-2-82								
10-8-82								
10-14-82								
10-20-82								
10-26-82								
11-1-82	3.5214							PEN NOT RING WEL
11-7-82	3.4919	3.5482	.0570 CORRECTED .0563	41	45	1836	31	23.72
11-13-82	3.5194	3.5868	.0682 CORRECTED .0674	41	45	1836	37	23.72
11-19-82	3.5111	3.5607	.0502 .0496	39.5	43.5	1775	28	23.73
11-25-82	3.5264	3.6109	.0855 .0845	41	45	1836	47	23.73
12-1-82	3.5377	3.6436	.1072 .1059	38.5	42	1714	63	23.72
12-7-82	3.5511	3.6807	.1311 .1296	39	43	1754	75	23.72
12-13-82	3.5312	3.6360	.1060 .1048	41.5	45.5	1856	58	23.05
12-19-82	3.5250	3.6629	.1512 .1379	41.5	45.5	1856	81	21.59
12-25-82	3.4273							23.72
12-31-82	3.3805	3.4913	.1121 .1108	40.5	44.5	1816	62	23.73

Best Available Copy

HI-VOL STATION # 19

FLORIDA SUGAR CANE LEAGUE, INC.

HI-VOL DATA SHEET

	DATE	TARE WT.	FINAL WT.	SAMPLE WT.	OBSERVED FLOW	TRUE FLOW	TOTAL VOL. M3	MG/M3	
	1-6-83	3.4207	3.5177	.1056 .0970	41.5	45.5	1856	57	22.05
	1-12-83	3.4085	3.7718	.3676 .3633	42	46.5	1897	194	23.72
	1-18-83	3.3866	3.5650	.1818 .1784	44	48.5	1979	92	23.55
	1-24-83	3.3810	3.4428	.0626 .0618	43.5	48	1958	32	23.70
	1-30-83	3.3843	3.4433	.0597 .0590	44	48.5	1979	30	23.70
	2-5-83	3.4130	3.5156	.1039 .1026	43.5	48	1958	53	23.70
	2-11-83	3.3797	3.4431	.0641 .0634	43	47.5	1938	33	23.72
	2-17-83	3.4571	3.4991	.0425 .0420	41	45	1836	23	23.72
	2-23-83	3.4274	3.5047	.0783 .0773	41.5	45.5	1856	42	23.70
	3-1-83	3.4498	3.5253	.07[illegible] .0755	41.5	45.5	1856	41	23.72
	3-7-83	3.4174	3.4893	.0719	41.5	45.5	1834 1856	39	23.72
	3-13-83	3.5972	3.7860	.1888	43	47.5	1915	99	23.72
*	3-19-83	3.5246	3.9280	.4034	41	46.5	1835 1897	214	23.55
	3-25-83	3.4845	3.6201	.1356	43	48.5	1936 1979	69	23.72
	3-31-83	3.5486	3.6014	.0528	41.5	47	1895	28	23.72

* use new calibration

Best Available Copy

HI-VOL STATION # 19

FLORIDA SUGAR CANE LEAGUE, INC.

HI-VOL DATA SHEET

	DATE	TARE WT.	FINAL WT.	SAMPLE WT.	OBSERVED FLOW	TRUE FLOW	TOTAL VOL. M3	MG/M3	
	4-6-83	3.5201	3.6428	.1227	41.5	47	1895	65	23.72
	4-12-83	3.5965	3.6728	.0763	41	46.5	1873	41	23.70
	4-18-83	3.5844	3.6777	.0933	41.5	47	1894	49	23.70
	4-24-83	3.5479	3.6737	.1258	41	46.5	1873	67	23.70
	4-30-83	3.5174	3.6301	.1127	41	46.5	1875	60	23.71
	5-6-83	3.4885	3.5535	.0650	41	46.5	1873	35	23.70
	5-12-83	3.6130	3.7383	.1253	38.5	43.5	1753	71	23.70
	5-18-83	3.5820	3.6991	.1171	39.5	45	1813	65	23.70
	5-24-83	3.6054	3.6995	.0941	39	44	1773	53	23.70
	5-~~24~~30-83	3.5342	3.5735	.0393	40.5	46	1852	21	23.68
*	6-5-83	3.5877	3.6353	.0476	41	46.5	1887	25	23.37
	6-11-83	3.5665	3.5939	.0274	39	44.5	1793	15	23.70
	6-17-83	3.5856	—	—	—	—	—	—	23.70
	6-23-83	3.5441	3.5800	.0359	39.5	45	1812	20	23.68
	6-29-83	3.4775	3.5325	.0550	39.5	45	1812	30	23.68

* NEW CALIBRATION

HI-VOL STATION # 19

FLORIDA SUGAR CANE LEAGUE, INC.

HI-VOL DATA SHEET

DATE	TARE WT.	FINAL WT.	SAMPLE WT.	OBSERVED FLOW	TRUE FLOW	TOTAL VOL. M3	MG/M3	
7-5-83	3.2386							
7-11-83	3.2775	3.3385	.0610	41	46.5	1872	33	23.68
7-17-83	3.5145	3.6706	.1561	40	45.5	1832	85	23.68
7-23-83	3.4923	3.6168	.1245	39.5	45	1812	69	23.68
7-29-83	3.6291	3.6778	.0487	39	44.5	1791	27	23.68
8-4-83	3.6508	3.6955	.0447	39	44.5	1791	25	23.68
8-10-83	3.3339							
8-16-83	3.6068	3.6393	.0325	39.5	45	1813	18	23.70
8-22-83	3.3539	3.4195	.0656	41	46.5	1872	35	23.68
8-28-83	3.4682	3.5289	.0607	40	45.5	1833	33	23.70
* 9-3-83	3.4021	3.4549	.0528	40.5	46.5	1873	28	23.70
9-9-83	3.4125							
9-15-83	3.4023	3.4354	.0331	41	47	1892	17	23.68
9-21-83	3.3562	3.3911	.0349	40.5	46.5	1872	19	23.68
9-27-83	3.5872	3.6261	.0389	39.5	45.5	1832	21	23.68

1720-002

HI-VOL STATION # 19

FLORIDA SUGAR CANE LEAGUE, INC.

HI-VOL DATA SHEET

DATE	TARE WT.	FINAL WT.	SAMPLE WT.	OBSERVED FLOW	TRUE FLOW	TOTAL VOL. M3	MG/M^3	
10-3-83	3.5457	3.5791	.0334	39	45	1812	18	23.68
10-9-83	3.5889	3.6333	.0444	39.5	45.5	1832	24	23.68
10-15-83	3.5075	3.5370	.0295	40	46	1852	16	23.68
10-21-83	3.5813	3.6084	.0271	39.5	45.5	1833	15	23.70
10-27-83	3.6081	3.6672	.0591	39	45	1813	33	23.7
11-2-83	3.5057	3.6001	.0944	40	46	1852	51	23.68
11-8-83	3.5804	3.6333	.0529	40	46	1853	29	23.70
11-14-83	3.5158	3.6014	.0856	40.5	46.5	1893	46	23.70
11-20-83	3.3999	3.4346	.0347	38.5	44.5	1791	47	23.68
11-26-83	3.3968	3.4668	.0700	40	46	1853	38	23.70
* 12-2-83	3.4598	3.7139	.2541	38.5	44	1786	142	23.33
12-8-83	3.3841	3.4350	.0509	41	46.5	1872	27	23.68
12-14-83								
12-20-83								
12-26-83								

APPENDIX K

SUPPORTIVE COMPUTER MODEL PRINTOUTS

(BOUND SEPARATELY)

UNITED STATES SUGAR CORPORATION
P. O. Drawer 1207
CLEWISTON, FLORIDA 33440

February 1, 1984

DER
FEB 02 1984
BAQM

Mr. David Knowles, Engineer
Department of Environmental Regulation
2269 Bay Street
Fort Myers, Florida 33901

RE: Hendry County - AP
USSC Clewiston

Dear Mr. Knowles:

We are enclosing two copies of a new revised Construction Permit Application for the proposed bagasse boiler #4 for our Clewiston Sugar Mill to replace the original application already submitted dated January 9, 1984.

To expedite the permit review we are sending directly to Mr. Clair Fancy in Tallahassee the other required two copies as was discussed with him last week in conversation with Mr. Peter Cunningham of Hopping, Boyd, Green & Sams who is representing us in this matter.

As we indicated before we would appreciate your expeditious handling of this application because of the tight schedule we face to have the boiler completed in time for the 1984-85 season which starts early November.

Sincerely,

UNITED STATES SUGAR CORPROATION

A. R. Mayo

A. R. Mayo
Vice President, Sugar Houses

ARM:jt
Enclosures

cc: Mr. Clair Fancy

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

ST. JOHNS RIVER DISTRICT
3319 MAGUIRE BOULEVARD
SUITE 232
ORLANDO, FLORIDA 32803

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

ALEX SENKEVICH
DISTRICT MANAGER

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Bagasse/Oil-Fired Boiler [xx] New[1] [ ] Existing[1]

APPLICATION TYPE: [xx] Construction [ ] Operation [ ] Modification

COMPANY NAME: U.S. Sugar Corporation, Clewiston Mill COUNTY: Hendry

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Boiler 4

SOURCE LOCATION: Street W.C. Owens Avenue and Clewiston Street City Clewiston

UTM: East 506.1 North 2956.9

Latitude 26 ° 44 ' 30 "N Longitude 81 ° 56 ' 15 "W

APPLICANT NAME AND TITLE: A.R. Mayo, Vice President

APPLICANT ADDRESS: P.O. Drawer 1207, Clewiston, Florida 33440

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of U.S. Sugar Corporation

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: A. R. Mayo

A.R. Mayo, Vice President
Name and Title (Please Type)

Date: Feb. 1, 1984 Telephone No. 813-983-8121

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed David A. Buff

David A. Buff
Name (Please Type)

Environmental Science and Engineering, Inc.
Company Name (Please Type)

P.O. Box ESE, Gainesville, Florida 32602
Mailing Address (Please Type)

Florida Registration No. 19011 Date: Feb. 1, 1984 Telephone No. 904/332-3318

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See PSD Report

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction March 1984 Completion of Construction January 1985

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Spray Impingement Scrubber: $200,000

Stack: $25,000

Fan: $15,00

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

See PSD Report for permits for existing boilers

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 26 ; if power plant, hrs/yr _____ ; if seasonal, describe: Normally from November thru March; maximum season would be October 15 thru April 15 (182 days/yr)

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? _____

   b. If yes, has "Lowest Achievable Emission Rate" been applied? _____

   c. If yes, list non-attainment pollutants. _____

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? _____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

See PSD Report for Source Applicability

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Not Applicable

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 545.5 x 10^6 Btu/hr on bagasse or bagasse/oil 225.0 x 10^6 Btu/hr maximum from oil

2. Product Weight (lbs/hr): 250,000 lb/hr Steam

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Particulates	109.1	238	0.2 lb/10^6Btu	109.1	1212	2647	C
Sulfur Dioxide	642.9	382	-	-	697.4	667	C
Nitrogen Oxides	136.8	206	-	-	136.8	206	C
Carbon Monoxide	136.4	298	-	-	136.4	298	C
Vol. Org. Comps.	128.8	281	-	-	128.8	281	C

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Spray Impingement Scrubber Joy Turbulaire	Particulate	90+%	See PSD Report	See PSD Report
Type D, Size 150 or	SO_2 from bagasse	50%	N/A	"
equivalent				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Bagasse		68,182 lb/hr dry 151,528 lb/hr wet	545.5
No. 6 Fuel Oil		1,499 gal/hr	225.0

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: See PSD Report

Percent Sulfur: ______ Percent Ash: ______

Density: ______ lbs/gal Typical Percent Nitrogen: ______

Heat Capacity: ______ BTU/lb ______ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average Not Applicable Maximum Not Applicable

G. Indicate liquid or solid wastes generated and method of disposal.

Water from Scrubbers used to sluice cane juice mud. Scrubber water discharges to holding ponds.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 150 ft. Stack Diameter: 7.25 ft.

Gas Flow Rate: See PSD Report ACFM ______ DSCFM Gas Exit Temperature: 153 °F.

Water Vapor Content: 30 % Velocity: See PSD Report FPS

SECTION IV: INCINERATOR INFORMATION

Not Applicable

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste ______

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ______

Brief description of operating characteristics of control devices: ______________________

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS See PSD Report

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [XX] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[XX] Yes [ ] No

Contaminant	Rate or Concentration
Particulate	0.15 lb/10^6 Btu (bagasse): 0.1 lb/10^6 Btu (oil
SO_2	1.0% Sulfur oil
Other pollutants	Uncontrolled emission rate

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
Particulate - bagasse: oil	0.2 lb/10^6 Btu: 0.1 lb/10^6 Btu
Sulfur Dioxide - Bagasse: oil	0.25 lb/10^6 Btu: 2.5% S oil and 500,000 gal/y
Other pollutants	Maximum emission rate shown in Section III.C

D. Describe the existing control and treatment technology (if any). See PSD Report

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary). See PSD Report

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected: See PSD Report

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data

1. FSCL no. sites 2 TSP ______ ( ) SO^2* ______ Wind spd/dir

Period of Monitoring 10 / 1 / 82 to 12 / 8 / 83
month day year month day year

Other data recorded ______

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [XX] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[XX] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. 5 Year(s) of data from 1 / 1 / 70 (month day year) to 12 / 31 / 74 (month day year)

2. Surface data obtained from (location) West Palm Beach Airport

3. Upper air (mixing height) data obtained from (location) Miami

4. Stability wind rose (STAR) data obtained from (location) West Palm Beach Airport

C. Computer Models Used

1. Industrial Source Complex Modified? If yes, attach description.

2. ______ Modified? If yes, attach description.

3. ______ Modified? If yes, attach description.

4. ______ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	See PSD Report	grams/sec
SO^2	See PSD Report	grams/sec

E. Emission Data Used in Modeling See PSD Report

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review. See PSD Report

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources. See PSD Report

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology. See attached supportive information

PREVENTION OF SIGNIFICANT DETERIORATION
REPORT

U.S. SUGAR CORPORATION
CLEWISTON MILL
BOILER NUMBER 4

Prepared By:

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

January 1984

ESE No. 83-172-0100

PREVENTION OF SIGNIFICANT DETERIORATION REPORT

U.S. SUGAR CORPORATION
CLEWISTON MILL
BOILER NUMBER 4

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ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

January 1984

ESE No. 83-172-0100

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1.0 PROJECT DESCRIPTION

1.1 EXISTING MILL OPERATIONS

U.S. Sugar Corporation currently owns and operates a sugar cane processing mill in Clewiston, Hendry County, Florida (Figures 1-1 and 1-2). The mill is fairly isolated from other significant air pollution sources, the nearest such sources being the Gulf & Western Foods sugar mill, located 17 kilometers (km) southeast, and the Sugar Cane Growers Cooperative, Inc. sugar mill, located 29 km to the east. The plant is located near the southwestern edge of Lake Okeechobee in a rural setting and is almost totally surrounded by sugar cane fields.

A flow diagram of the operations at the Clewiston mill is shown in Figure 1-3. Sugar cane from the surrounding fields is harvested and brought to the mill where the cane is crushed, and the juice is extracted. Steam generated in the mill boilers is used to power the grinding mills. The juice is concentrated and separated into sugar crystals and molasses. Bagasse is cane from which the juice has been extracted and is a waste product of the extraction process. Process steam for the mill is provided by burning bagasse in five boilers (Nos. 1, 2, 3, 5, and 6). A small amount of oil is sometimes burned in Boilers 1, 2, and 3 to supplement steam production and to stabilize boiler operation. Boilers 5 and 6 are equipped to burn bagasse only. The total plant steam generating capacity is currently 720,775 pounds per hour (lb/hr) when all boilers are operating at maximum capacity (total rated capacity is 490,000 lb/hr).

Bagasse is fed to the existing boilers by conveyors and feeders. The inherent moisture content of the incoming bagasse, normally 55 percent, effectively minimizes potential fugitive particulate matter (PM) emissions from bagasse handling. Fuel oil is supplied to each boiler by means of a piping and metering system. A single fuel oil storage tank of 400,000-gallon capacity feeds all of the existing boilers. Individual boiler supply lines are routed from the main supply line, and each individual boiler line is fitted with a metering device to measure

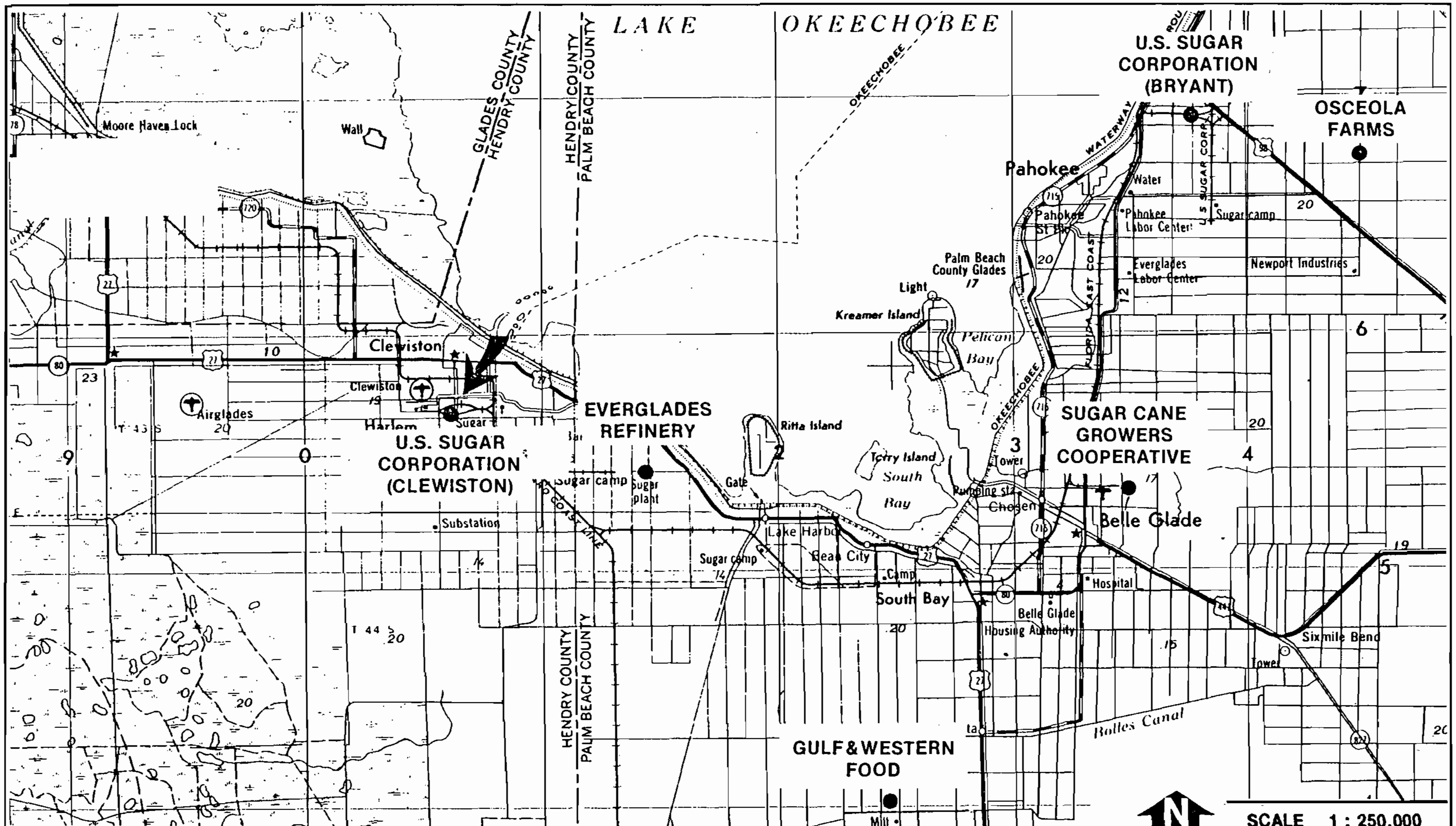

Figure 1-1
LOCATION OF U.S. SUGAR CORPORATION WITH RESPECT TO SURROUNDING AREA

SOURCE: ESE, 1983.

U.S. SUGAR CORPORATION
Clewiston, Florida

Best Available Copy

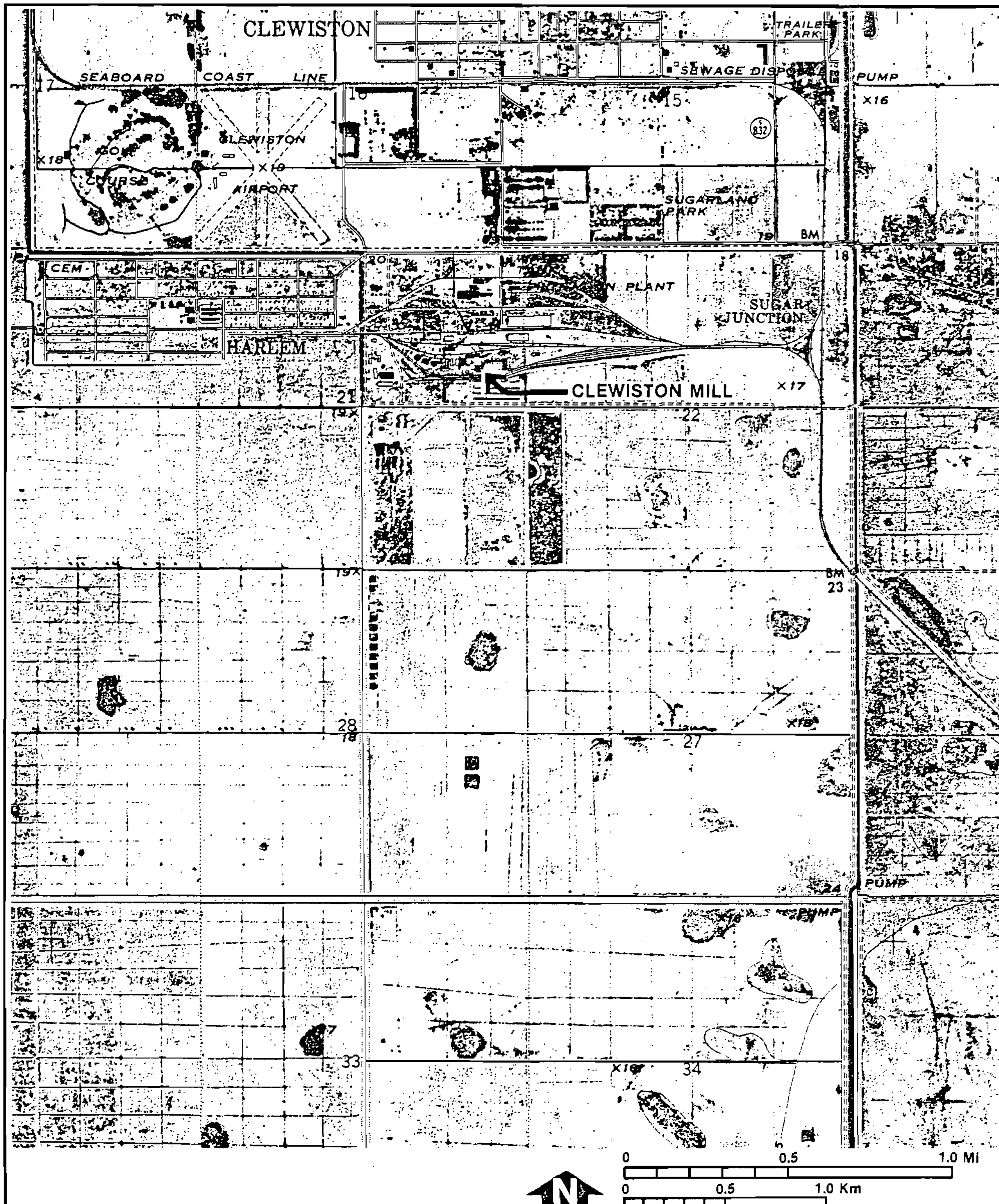

Figure 1-2
VICINITY MAP OF U.S. SUGAR CORPORATION'S CLEWISTON MILL

SOURCE: USGS, 1970.

U.S. SUGAR CORPORATION
Clewiston, Florida

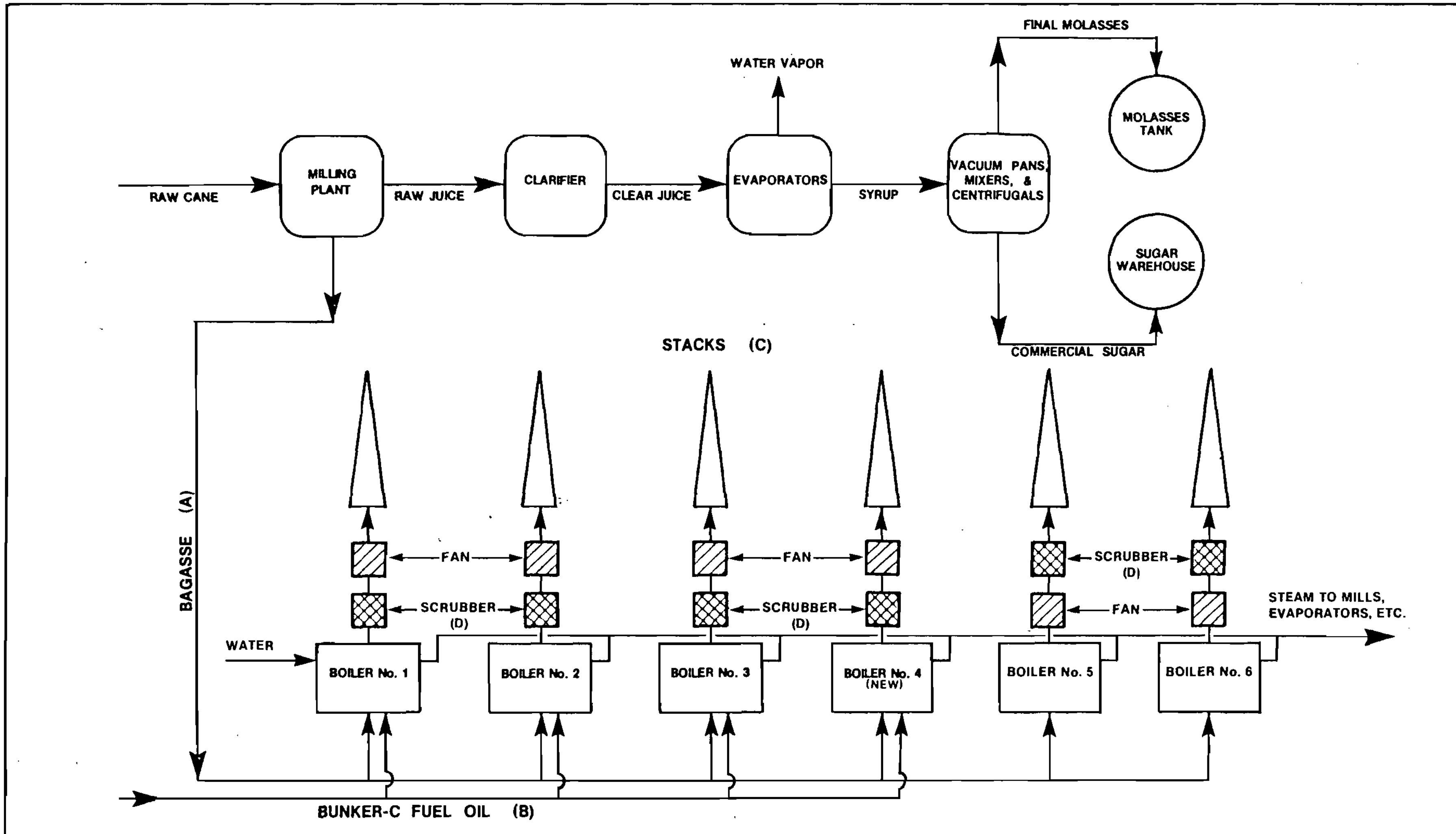

Figure 1-3
SCHEMATIC PROCESS FLOW DIAGRAM

SOURCE: ESE, 1983.

U.S. SUGAR CORPORATION
Clewiston, Florida

the amount of oil fed to the boiler. No additives are used in the oil; oil is burned as received from Belcher Oil Company.

The amount of bagasse fed to each boiler is not directly measured. However, steam temperature and pressure, boiler feedwater temperature and pressure, and steam flow rate are measured. Bagasse consumption is determined through the following procedure:

1. The enthalpy of the steam and the boiler feedwater is calculated from the temperature and pressure measurements.
2. Total heat input to the steam is calculated from the enthalpy difference and the steam flow.
3. Heat input to the boiler due to oil firing is calculated from the oil consumption data and the fuel heating value, this latter parameter provided by the oil supplier (see Appendix A for representative fuel analysis). An 80-percent boiler efficiency is assumed when firing oil and is used to determine the heat input to the steam.
4. The remaining required heat input to the steam due to bagasse firing is then calculated as the difference between total heat input to the steam (Item 2 above) and the heat input due to oil firing (Item 3 above).
5. Heat input to the boiler from bagasse firing is then determined based on 55-percent efficiency, and the amount of bagasse required is calculated based upon an average of 8,000 British thermal units per pound (Btu/lb) of bagasse (dry basis) (see Appendix A for fuel analysis).

All the boilers at the Clewiston mill are equipped with spray impingement scrubbers to control PM emissions. Exhaust gases from each boiler pass through a scrubber, a fan, and finally the exhaust stack, as shown in Figure 1-3. All the existing boilers at the mill must meet a PM emission limit of 0.3 $lb/10^6$ Btu when burning bagasse and 0.1 $lb/10^6$ Btu when burning oil.

The sugar cane industry is seasonal: the Clewiston mill typically operates 150 days per year, from November through March. To be conservative, all analyses presented in this report are based on a 182-day crop year (October 15 through April 15).

1.2 PROPOSED MODIFICATION

To meet anticipated steam demands at the Clewiston mill, U.S. Sugar Corporation must install a new bagasse/oil-fired boiler of 250,000 lb/hr steam capacity. The new boiler (Boiler 4) must be operational by the 1984-1985 crop year (i.e., by November 1984); therefore, construction of the new boiler will commence as soon as a construction permit is obtained. The boiler, initially designed to burn coal or gas, was manufactured by Foster Wheeler Corporation and is capable of generating the rated amount of steam by burning bagasse only. The boiler will be of the traveling gate type. Steam production due to fuel oil firing will be limited to 150,00 lb/hr, or a heat input of 225.0 million Btu per hour (10^6 Btu/hr). Specifications for the new boiler are presented in Appendix B.

Since all existing boilers at the Clewiston mill currently use No. 6 fuel oil of about 2.4-percent sulfur and the mill has a single fuel oil storage tank and supply system, it is proposed to use this same oil (maximum of 2.5-percent sulfur) in the new boiler. Since fuel oil is expensive compared to bagasse (a waste product), every attempt is made to minimize fuel oil usage in boilers at the mill. U.S. Sugar Corporation will limit total fuel oil consumption in the new boiler to 500,000 gallons per year. Actual usage is expected to be far below this level. The entire Clewiston mill averaged 375,000 gallons of fuel oil consumption per year in 1981 and 1982.

The proposed Boiler 4 will be equipped with a spray impingement scrubber similar to the other scrubbers at the Clewiston mill. The scrubber will be capable of controlling PM emissions to a level of 0.2 lb/10^6 Btu heat input from bagasse firing and 0.1 lb/10^6 Btu heat input from oil firing. These levels represent the State of Florida emission

standards for carbonaceous fuel burning equipment (i.e., bagasse boilers). U.S. Sugar Corporation considers the spray impingement scrubber to be the Best Available Control Technology (BACT) for bagasse boilers considering their proven ability in the Florida sugar cane industry, economics, energy considerations, and environmental impacts.

The spray impingement scrubber will be manufactured by U.S. Sugar Corporation. The design will be equivalent to a Western Precipitation (Joy) Turbulaire scrubber, Type D, Size 150, and will operate at a pressure drop of approximately 5.5 inches of water (in. H_2O) and at a water usage rate of 200 to 300 gallons per minute (gpm). Details of the scrubber design, Joy manufacturing literature, and Joy's performance guarantee for this scrubber design are presented in Appendix C.

The exhaust fan, also to be manufactured by U.S. Sugar Corporation, will be of American Standard design, equivalent to Model 537 DI 2/3 DW, Series 2014. The fan will operate at approximately 1,000 revolutions per minute (rpm) and 800 to 1,000 horsepower at a static pressure of about 18 in. H_2O. The fan will be electrically driven. A fan curve in not available.

In addition to the fuel oil usage limitations placed on the new boiler, limitations will also be placed on operation of the existing boilers. These limitations will ensure that all ambient air quality standards are not exceeded in the vicinity of the Clewiston mill due to mill operation. The limitations, itemized below, are discussed in more detail in the remainder of this section.

1. Total mill fuel oil consumption will be limited to 6,300 gallons for a 3-hour period (average of 2,100 gallons per hour) and 40,800 gallons for a 24-hour period (average of 1,700 gallons per hour).
2. Allowable PM emissions for Boilers 1 and 2 will be reduced to 0.25 $lb/10^6$ Btu when burning bagasse.

Capacities and fixed stack parameters for both the existing boilers (Nos. 1, 2, 3, 5, and 6) and the proposed boiler (No. 4) at the Clewiston mill are shown in Table 1-1. Capacities are shown in terms of pounds of steam produced per hour (lb stm/hr) and heat input to the boilers (10^6 Btu/hr). "Rated capacity" represents the actual nameplate rating of the boiler. "Maximum capacity" represents the highest capacity attained during any particulate compliance test of the boiler (see Appendix D for compilation of data). As shown, Boilers 1, 2, and 3 have achieved steam production rates significantly in excess of their rated capacities. The air quality analysis presented in Section 5.0 was based on the boilers operating at their maximum capacities.

The fixed stack parameters presented in Table 1-1 do not vary according to boiler operation. Stack height and diameter, of course, are fixed according to design of the stack. The stack temperature does not vary appreciably for any of the boilers, even when fuel oil is fired, as demonstrated by the source test data presented in Appendix D. Stack temperatures shown in Table 1-1 are based on the average temperature measured during source tests on each boiler during the last 3 crop years. The exhaust gas flow rate and velocity can vary depending on the combination of fuels being fired in the boilers.

Ambient air quality standards for PM exist for the annual and 24-hour averaging times. As a result, it is necessary to determine worst-case 24-hour operating conditions for PM for the Clewiston mill. The current PM emission limits for the existing boilers are 0.3 lb/10^6 Btu when firing bagasse and 0.1 lb/10^6 Btu when firing oil. Similarly, the proposed boiler must meet a PM emission limit of 0.2 lb/10^6 Btu for bagasse and 0.1 lb/10^6 Btu for oil. After the proposed Boiler 4 begins operation, Boilers 1 and 2 will emit no more than 0.25 lb/10^6 Btu of PM when burning bagasse. The worst-case operating condition for PM emissions is the firing of 100-percent bagasse in all of the boilers.

Table 1-1. Capacities and Fixed Stack Parameters for Existing and Proposed Boilers at U.S. Sugar Corporation's Clewiston Mill

Boiler No.	Rated Capacity		Maximum Capacity		Stack Height (m)	Stack Diameter (m)	Stack Temperature (°K)
	lb stm/hr	10^6 Btu/hr*	lb stm/hr	10^6 Btu/hr*			
Existing							
1	150,000	286.0	236,250	462.3	22.86	1.86	344
2	150,000	286.0	214,817	453.2	22.86	1.86	343
3	100,000	191.0	128,483	275.0	27.43	2.29	342
5	70,000	134.0	70,667	136.0	19.81	1.83	338
6	70,000	134.0	70,588	138.1	19.81	1.83	340
Proposed							
4	250,000	545.5	--	--	45.72	2.21	340

* When firing bagasse only.

Source: U.S. Sugar Corporation, 1983.

Table 1-2 summarizes Clewiston mill operating conditions for the case of total bagasse firing.

Three-hour and 24-hour ambient air quality standards for sulfur dioxide (SO_2) require that worst-case short-term operating conditions be identified for the mill. To ensure that the standards are met, U.S. Sugar will limit total No. 6 fuel oil consumption in the mill to 6,300 gallons for a 3-hour period (average of 2,100 gal/hr) and 40,800 gallons per day (gpd) (average of 1,700 gal/hr). Shown in Table 1-3 are the boiler and fuel usage parameters and SO_2 emissions associated with the 3-hour worst-case scenario. Data for the 24-hour worst-case scenario are presented in Table 1-4.

All of the existing boilers have similar stack heights (65 to 75 feet). The proposed Boiler 4 will have a greater stack height (150 feet); therefore, worst air quality impacts will occur when fuel oil is burned in the boilers with the shorter stacks (i.e., Boilers 1, 2, and 3: Boilers 5 and 6 burn bagasse only). The remainder of maximum steam capacity for each of the boilers is generated by burning bagasse.

The SO_2 emission rates shown in Tables 1-3 and 1-4 reflect a 50-percent reduction in the theoretical amount of SO_2 resulting from burning bagasse. No reduction in theoretical SO_2 is assumed for fuel oil burning. The 50-percent reduction for bagasse is assumed to be conservative for bagasse burning in boilers equipped with spray impingement type scrubbers, as substantiated by the analysis presented in Appendix E. The resulting worst-case 3-hour and 24-hour SO_2 emissions are 1,250.2 lb/hr and 1,108.0 lb/hr, respectively, total for all boilers.

Burning fuel oil in the boilers alters the boiler exhaust flow rate, which may, in turn, affect the plume rise of the exhaust gases and ground-level air quality impacts. To accurately simulate this situation, a theoretical combustion calculation for typical No. 6 fuel

Table 1-2. Clewiston Mill Emissions and Stack Parameters Used in PM Impact Analysis

Boiler	Fuel	Maximum Capacity (10^6 Btu/hr)	Particulate Emissions lb/10^6 Btu	Particulate Emissions lb/hr	Exhaust Flow Rate* (acfm)	Exhaust Gas Velocity (m/s)
1	Bagasse	462.3	0.25	115.6	147,022	25.5
2	Bagasse	453.2	0.25	113.3	149,671	25.9
3	Bagasse	275.0	0.3	82.5	101,931	11.7
5	Bagasse	136.0	0.3	40.8	63,620	11.4
6	Bagasse	138.1	0.3	41.4	61,294	11.0
4 (Proposed)	Bagasse	545.5	0.2	109.1	205,180	25.2

Abbreviations: acfm = actual cubic feet per minute.
m/s = meters per second.

* Flow rate associated with source test during which maximum capacity of boiler was reached. For the proposed Boiler 4, source test data from U.S. Sugar Bryant Mill Boiler 5 was used (see Appendix D), since this boiler is essentially identical to the proposed boiler. Maximum capacity test was again used, but since this test was below rated capacity, exhaust flow rate was ratioed upwards to obtain flow for rated capacity of 250,000 lb stm/hr.

Source: ESE, 1983.

Table 1-4. Clewiston Mill Worst-Case 24-Hour SO_2 Emissions

Boiler	Maximum Capacity (lb stm/hr)	Fuel Oil			Bagasse			SO_2 Emissions (lb/hr)†		
		gal/hr	10^6 Btu/hr	lb stm/hr	lb stm/hr	10^6 Btu/hr	lb/hr (dry)	Oil	Bagasse	Total
1	236,250	690	103.5	77,023	159,227	311.2	38,900	282.9	77.8	360.7
2	214,817	630	94.5	64,340	150,477	321.5	40,188	258.3	80.4	338.7
3	128,483	380	57.0	38,809	89,674	191.6	23,950	155.8	47.9	203.7
5	70,667	0	0	0	70,667	136.0	17,000	0	34.0	34.0
6	70,558	0	0	0	70,558	138.1	17,263	0	34.5	34.5
4(Proposed)	250,000	0	0	0	250,000	545.5	68,188	0	136.4	136.4
TOTAL	970,775	1,700*	255.0	180,172	790,603	1,643.9	205,489	697.0	411.0	1,108.0

* 40,800 gallons for a 24-hour period.
† Assumes 50-percent SO_2 removal efficiency in scrubber when burning bagasse; no removal when burning oil.

NOTES: No. 6 Fuel Oil - 2.5 percent sulfur
18,300 Btu/lb
8.2 lb/gal
80-percent boiler efficiency

Bagasse (dry) - 0.2 percent sulfur
8,000 Btu/lb
55-percent boiler efficiency

Steam - Boiler 1 - 1,075 Btu/lb
Boiler 2 - 1,175 Btu/lb
Boiler 3 - 1,175 Btu/lb
Boiler 5 - 1,058 Btu/lb
Boiler 6 - 1,076 Btu/lb
Boiler 4 (Proposed) - 1,200 Btu/lb

Source: ESE, 1983.

Table 1-3. Clewiston Mill Worst-Case 3-Hour SO_2 Emissions

Boiler	Maximum Capacity (lb stm/hr)	Fuel Oil gal/hr	Fuel Oil 10^6 Btu/hr	Fuel Oil lb stm/hr	Bagasse lb stm/hr	Bagasse 10^6 Btu/hr	Bagasse lb/hr (dry)	SO_2 Emissions (lb/hr)† Oil	SO_2 Emissions (lb/hr)† Bagasse	SO_2 Emissions (lb/hr)† Total
1	236,250	815	122.3	91,014	145,236	283.9	35,488	334.2	71.0	405.2
2	214,817	800	120.0	81,702	133,115	284.4	35,550	328.0	71.1	399.1
3	128,483	485	72.8	49,566	78,917	168.6	21,074	198.9	42.1	241.0
5	70,667	0	0	0	70,667	136.0	17,000	0	34.0	34.0
6	70,558	0	0	0	70,558	138.1	17,263	0	34.5	34.5
4(Proposed)	250,000	0	0	0	250,000	545.5	68,188	0	136.4	136.4
TOTAL	970,775	2,100*	315.1	222,282	748,493	1,556.5	194,563	861.1	389.1	1,250.2

* 6,300 gallons for a 3-hour period.
† Assumes 50-percent SO_2 removal efficiency in scrubber when burning bagasse; no removal when burning oil.

NOTES: No. 6 Fuel Oil - 2.5 percent sulfur
18,300 Btu/lb
8.2 lb/gal
80-percent boiler efficiency
Bagasse (dry) - 0.2 percent sulfur
8,000 Btu/lb
55-percent boiler efficiency
Steam - Boiler 1 - 1,075 Btu/lb
Boiler 2 - 1,175 Btu/lb
Boiler 3 - 1,175 Btu/lb
Boiler 5 - 1,058 Btu/lb
Boiler 6 - 1,076 Btu/lb
Boiler 4 (Proposed) - 1,200 Btu/lb

Source: ESE, 1983.

oil was performed, with the exhaust gases passed through the wet scrubber (see Appendix F).

In addition, the average acfm of exhaust gases produced per 10^6 Btu heat input from bagasse fuel was determined for Boilers 1, 2, and 3 from source test data (see Appendix F). Based on these calculations and the relative amounts of bagasse and oil burned in each boiler, an adjusted boiler exhaust flow rate was calculated for the worst-case 3-hour and 24-hour SO_2 emission scenarios (Table 1-5). The resulting flow rates are not affected greatly by the burning of fuel oil (see Table 1-2 for comparison).

Table 1-5. Exhaust Gas Parameters Associated with Worst-Case 3-Hour and 24-Hour SO_2 Emissions

Boiler	Fuel Oil: Heat Input 10^6 Btu/hr	Fuel Oil: lb oil/hr†	Fuel Oil: acfm**	Bagasse: Heat Input 10^6 Btu/hr	Bagasse: acfm per 10^6 Btu/hr	Bagasse: acfm	Total acfm	Exit Gas Velocity (m/s)
				3-HOUR CASE				
1	122.3	6,683	39,045	283.9	332.9	94,510	133,555	23.1
2	120.0	6,560	38,327	284.4	367.5	104,517	142,844	24.7
3	72.8	3,977	23,236	168.6	382.3	64,456	87,692	10.1
4 (New)*	0	0	0	545.5	--	205,180	205,180	25.2
5*	0	0	0	136.0	--	63,620	63,620	11.4
6*	0	0	0	138.1	--	61,294	61,294	11.0
				24-HOUR CASE				
1	103.5	5,658	33,057	311.2	332.9	103,598	136,655	23.6
2	94.5	5,166	30,182	321.5	367.5	118,151	148,333	25.6
3	57.0	3,116	18,205	191.6	382.3	73,249	91,454	10.5
4 (New)*	0	0	0	545.5	--	205,180	205,180	25.2
5*	0	0	0	136.0	--	63,620	63,620	11.4
6*	0	0	0	138.1	--	61,294	61,294	11.0

* Based upon values shown in Table 1-2 for bagasse burning.
† From Tables 1-3 and 1-4 with oil = 8.2 lb/gal.
** Based upon 350.55 acf/lb oil (see Appendix F).

Source: ESE, 1983.

2.0 AIR QUALITY REVIEW REQUIREMENTS AND SOURCE APPLICABILITY

The following discussions pertain to the regulatory requirements that must be met for the construction and operation of the proposed Boiler 4, as required by federal and state PSD regulations and other air quality regulations.

2.1 NATIONAL AND STATE AAQS

As a result of the requirements of the 1970 CAA Amendments, EPA enacted primary and secondary national AAQS (Federal Register, 1971) for six air pollutants. Primary national AAQS are required to protect the public health, and secondary national AAQS are required to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air.

Table 2-1 presents the existing applicable national and State of Florida AAQS. Since the original standards were issued in 1971, the following changes have been made to the national AAQS.

1. EPA eliminated the annual and 24-hour secondary AAQS for SO_2;
2. The AAQS for photochemical oxidants was redesignated as ozone, the concentration limit was increased, and the method for determining compliance was changed;
3. A new national AAQS for lead was promulgated; and
4. The hydrocarbon AAQS was rescinded.

Prior to these changes, the State of Florida promulgated the secondary national AAQS for SO_2 as the state AAQS. Since states have the authority to adopt AAQS more stringent than those established by EPA, the State of Florida has chosen to retain the secondary AAQS for SO_2 which were eliminated by EPA. Pollutants for which AAQS have been established are called "criteria" pollutants.

Areas of the country shown to be in violation of AAQS are designated as nonattainment areas, and new sources to be located in or near these

Table 2-1. Federal and State AAQS Applicable to the Proposed Project

Pollutant	Averaging Time	Federal Primary Standard	Federal Secondary Standard	State of Florida
Suspended Particulate Matter	Annual Geometric Mean	75	60	60
	24-Hour Maximum*	260	150	150
Sulfur Dioxide	Annual Arithmetic Mean	80	N/A	60
	24-Hour Maximum*	365	N/A	260
	3-Hour Maximum*	N/A	1,300	1,300
Carbon Monoxide	8-Hour Maximum*	10,000	10,000	10,000
	1-Hour Maximum*	40,000	40,000	40,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100
Ozone	1-Hour Maximum†	235	235	235
Lead	Calendar Quarter	1.5	1.5	1.5

* Maximum concentration not to be exceeded more than once per year.
† Maximum concentration not to be exceeded more than an average of 1 calendar day per year.

Sources: 40 CFR, Parts 50 and 52.
Ch 17-2, FAC.

areas may be subject to more stringent air permitting requirements. Areas of the state designated as nonattainment by EPA (Federal Register, March 3, 1978) and the State of Florida (Ch 17-2, FAC, 1982) are:

1. Sulfur Dioxide
   a. The northwest corner of Pinellas County
2. Ozone
   a. Duval County
   b. Orange County
   c. Pinellas County
   d. Hillsborough County
   e. Dade County
   f. Broward County
   g. Palm Beach County
3. Particulate Matter
   a. Downtown Jacksonville area
   b. A 7.5-mi radius circle in Hillsborough County

The U.S. Sugar Clewiston mill is located in Hendry County, which is designated as attainment for all pollutants. The closest nonattainment area to the mill is Palm Beach County, which is designated as nonattainment for ozone. It is noted that current Florida DER regulations provide that the Palm Beach County ozone nonattainment area will become attainment by March 31, 1984 (FAC, Chapter 17-2.410). This date is prior to the project start-up date of the new boiler of October 1984.

2.2 FEDERAL AND STATE PSD

2.2.1 General Requirements

Under federal PSD review requirements, all major new or modified sources of air pollutants regulated under CAA must be reviewed and approved by EPA (or in this case, reviewed by DER since review authority has been delegated to the state: Federal Register, Vol. 48, No. 226, November 22, 1983). A "major stationary source" is defined as any one of 28 named source categories which has the potential to emit 100 TPY or more, or any other stationary source which has the potential to emit 250 TPY or more, of any pollutant regulated under CAA. "Potential to emit" means the capability at maximum design capacity to emit a pollutant after the application of control equipment.

"Major modification" means any physical change in the design or operation of a major stationary source, or a series of contemporaneous changes in the design or operation of a major stationary source, that would result in a significant net emission increase of any pollutant regulated under CAA. "Significant" is defined as any increase in emissions in excess of specified levels (Table 2-2).

PSD review is used to determine whether significant air quality deterioration will result from the new or modified source. PSD requirements are contained in 40 CFR 52.21, Prevention of Significant Deterioration of Air Quality, and in the State of Florida PSD Regulations (Ch 17-2, FAC). Major sources are required to undergo the following reviews related to PSD for each pollutant emitted in significant amounts:

1. Control technology review,
2. Source impact analysis,
3. Air quality analysis (monitoring), and
4. Additional impact analyses.

Requirements for each of these areas are discussed in more detail below.

2.2.2 Increments/Classifications

Congress, in promulgating the 1977 CAA Amendments, specified that certain increases above an air quality "baseline concentration" level of SO_2 and PM concentrations would constitute significant deterioration. The magnitude of the increment that cannot be exceeded depends on the classification of the area in which a new source (or modification) will

Table 2-2. Federal and State of Florida PSD Significant Emission Rates

Pollutant	Regulated Under	Federal and State Significant Emission Rate (TPY)
Sulfur Dioxide	NAAQS, NSPS	40
Particulate Matter	NAAQS, NSPS	25
Nitrogen Oxides	NAAQS, NSPS	40
Carbon Monoxide	NAAQS, NSPS	100
Ozone	NAAQS, NSPS	40*
Lead	NAAQS	0.6
Sulfuric Acid Mist	NSPS	7
Total Fluorides	NSPS	3
Total Reduced Sulfur	NSPS	10
Reduced Sulfur Compounds	NSPS	10
Hydrogen Sulfide	NSPS	10
Asbestos	NESHAP	0.007
Beryllium	NESHAP	0.0004
Mercury	NESHAP	0.1
Vinyl Chloride	NESHAP	1
Benzene	NESHAP	0
Radionuclides	NESHAP	0
Inorganic Arsenic	NESHAP	0
Any Regulated Pollutant	--	Class I Impact†

* Increase in Volatile Organic Compound emissions.
† Any emission rate for a source located within 10 km of a Class I area which causes impacts of 1 ug/m^3, 24-hour average, or greater.

Notes: TPY = Tons per year
NAAQS = National Ambient Air Quality Standards.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.

Source: Code of Federal Regulations, Title 40, Part 52.21.

have an impact. Three classifications were designated based on criteria established in the CAA Amendments. Initially, Congress promulgated areas as Class I (international parks, national wilderness areas, and memorial parks larger than 5,000 acres; and national parks larger than 6,000 acres) or Class II (all other areas not designated as Class I). No Class III areas, which would be allowed greater deterioration than Class II areas, were designated. However, the states were given the authority to redesignate any Class II area to Class III status, provided certain requirements were met. EPA then promulgated as regulations the requirements for classifications and area designations. The State of Florida has adopted the EPA class designations and allowable PSD increments (Table 2-3).

The term "baseline concentration" evolves from federal and state PSD regulations and denotes a fictitious concentration level corresponding to a specified baseline date and certain additional baseline sources. The baseline concentration is comprised of the predicted impact of the baseline emissions and a representative background concentration, which refers to concentration levels due to sources not accounted for in the point source emission inventories (i.e., natural and distant manmade sources).

Currently, EPA and DER have different methods for calculating baseline concentrations for short-term averaging periods. With 5 years of meteorological data, DER defines baseline concentration as the second-highest concentration predicted for each receptor point from the baseline sources and emission rates. EPA methodology does not calculate an actual baseline concentration, but bases increment consumption on the net effect of increment-consuming and increment-expanding emissions. Since EPA methodology results in higher increment consumption values, increment consumption will be calculated by the EPA method for this PSD application.

Within Florida, there are four Class I areas: Everglades National Park, Chassahowitzka National Wilderness Area, St. Marks National Wilderness

Table 2-3. Federal* and State† PSD Allowable Increments

Pollutant/Averaging Time	Allowable Increment (ug/m^3) Class I	Class II	Class III
Particulate Matter			
Annual Geometric Mean	5	19	37
24-Hour Maximum**	10	37	75
Sulfur Dioxide			
Annual Arithmetic Mean	2	20	40
24-Hour Maximum**	5	91	182
3-Hour Maximum**	25	512	700

* 40 CFR Part 52, Section 52.21.
† Ch 17-2, FAC.
**Maximum concentration not to be exceeded more than once per year.

Source: ESE, 1983.

Area, and Bradwell Bay Wilderness Area. All of these Class I areas are more than 62 mi (100 kilometers) from the Clewiston mill site. The Everglades National Park Class I area is the closest and is located approximately 69 mi (110 kilometers) to the south. All other areas of the state classified as attainment or unclassifiable are designated Class II areas.

2.2.3 Control Technology Review

The control technology review requirements of the federal PSD regulations stipulate that all applicable federal and state emission-limiting standards be met, and that BACT be applied to control emissions from the source. The BACT requirements are applicable to all pollutants for which the increase in emissions from the source or modification exceeds the significant emission rate (see Table 2-2).

The proposed Boiler 4 will fire bagasse up to 545.5 x 10^6 Btu/hr heat input and fuel oil up to 225.0 x 10^6 Btu/hr. As a result, the boiler will not be subject to any federal NSPS. State of Florida emission standards for carbonaceous fuel burners will apply. These standards limit PM emissions to 0.2 lb/10^6 Btu when burning bagasse and 0.1 lb/10^6 Btu for heat input due to oil burning. No other state emission standards apply, other than an opacity standard. Opacity is limited to 30 percent, except that up to 40 percent is allowed for no more than 2 minutes in any 1-hour period.

The federally promulgated NESHAP (40 CFR 61) does not apply to the Clewiston mill, since bagasse/oil-fired boilers are not regulated under NESHAP.

Under EPA's implementation of the CAA Amendments, the basic control technology requirement is the application and evaluation of BACT. BACT is defined as follows [40 CFR 52.21(b)(12)]:

> An emission limitation...based on the maximum degree of reduction for each pollutant...which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable... for control of such pollutant.

In December 1978, EPA's Office of Air, Noise, and Radiation published Guidelines for the Evaluation of BACT to assist states and EPA Regional Offices in making BACT determinations. The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with state emission limits. An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than NSPS, is also required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems as well as the environmental benefits derived from these systems.

2.2.4 Air Quality Analysis

In accordance with requirements of 40 CFR 52.21(m), any application for a PSD permit must contain, for each pollutant regulated under CAA, an analysis of continuous ambient air quality data in the area affected by the proposed major stationary source or major modification. For a new major source, the affected pollutants are those that the source would potentially emit in a significant amount.

According to CAA, ambient air monitoring for a period of up to 1 year generally is appropriate to complete the PSD requirements of CAA. Existing data from the vicinity of the proposed source may be utilized, if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in EPA's Ambient Monitoring Guidelines for Prevention of Significant Deterioration (EPA, November 1980).

The regulations include an exemption which excludes or limits the pollutants for which an air quality analysis is conducted. This exemption states that the Administrator may exempt a proposed major stationary source or major modification from the monitoring requirements of 40 CFR 52.21(m) with respect to a particular pollutant if the emissions increase of the pollutant from the source or modification would cause, in any area, air quality impacts less than the federal de minimis levels presented in Table 2-4.

The State of Florida has passed similar PSD air quality analysis requirements. EPA and State of Florida de minimis air quality impact levels are currently identical. However, it should be noted that, in February 1981, EPA revised the de minimis levels and average times for three of the pollutants in the "Ambient Monitoring Guidelines for PSD" (EPA, February 1981). The averaging period for the de minimis level for lead was changed to 3 months, and the de minimis impact levels for beryllium and hydrogen sulfide were changed to 0.001 microgram per cubic meter (ug/m^3) and 0.2 ug/m^3, respectively. Those revisions, however, have not been made in the Code of Federal Regulations, and, therefore, the original federal (and State of Florida) de minimis levels technically still apply.

2.2.5 Source Impact Analysis

A source impact analysis must be performed by a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rates (Table 2-2). The PSD regulations specifically require the use of atmospheric dispersion models in performing impact analysis, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models must normally be used in performing the impact analysis. Specific applications for other than EPA-approved models require EPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the EPA publication, "Guideline on Air Quality Models" (EPA, 1978).

Table 2-4. Federal and State of Florida PSD De Minimis Impact Levels

	De Minimis Air Quality Impact Level (ug/m^3)		
Pollutant	Code of Federal Regulations	EPA Ambient Monitoring Guidelines	State of Florida
Sulfur Dioxide	13, 24-hour	13, 24-hour	13, 24-hour
Particulate Matter	10, 24-hour	10, 24-hour	10, 24-hour
Nitrogen Oxides	14, annual	14, annual	14, annual
Carbon Monoxide	575, 8-hour	575, 8-hour	575, 8-hour
Ozone	100 tons/yr*	100 tons/yr*	100 tons/yr*
Lead	0.1, 24-hour	0.1, 3-month	0.1, 24-hour
Sulfuric Acid Mist	†	†	†
Total Fluorides	0.25, 24-hour	0.25, 24-hour	0.25, 24-hour
Total Reduced Sulfur	10, 1-hour	†	10, 1-hour
Reduced Sulfur Compounds	10, 1-hour	†	10, 1-hour
Hydrogen Sulfide	0.04, 1-hour	0.2, 1-hour	0.04, 1-hour
Asbestos	†	†	†
Beryllium	0.0005, 24-hour	0.001, 24-hour	0.0005, 24-hour
Mercury	0.25, 24-hour	0.25, 24-hour	0.25, 24-hour
Vinyl Chloride	15, 24-hour	15, 24-hour	15, 24-hour
Benzene	†	†	†
Radionuclides	†	†	†
Inorganic Arsenic	†	†	†

* Increase in VOC emissions.
† No ambient air measurement method; no monitoring required.

Sources: 40 CFR 52.21(i)(8).
FAC, Chapter 17-2.500.
Ambient Monitoring Guidelines for Prevention of Significant Deterioration, EPA, November 1980.

Various lengths of record for meteorological data can be utilized for impact analysis. A 5-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If fewer than 5 years of meteorological data are used, the highest concentration at each receptor must be used.

2.2.6 Additional Impact Analysis

In addition to air quality impact analyses, federal PSD regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source. These analyses are to be conducted primarily for PSD Class I areas. Impacts due to general commercial, residential, industrial, and other growth associated with the source must also be addressed. These analyses are required for each pollutant emitted in significant amounts.

2.2.7 Good Engineering Practice (GEP) Stack Height

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds GEP or any other dispersion technique. On February 8, 1982, EPA promulgated final stack height regulations (EPA, February 8, 1982). Guidelines were published by EPA in July 1981 to assist in the determination of the GEP stack height.

GEP stack height is defined as the highest of:

1. 65 m, or
2. A height established by applying the formula:

   $H_g = H + 1.5L$

where: H_g = GEP stack height,
H = Height of the structure or nearby structure, and
L = Lesser dimension (height or projected width) of nearby structure(s).

"Nearby" is defined as a distance up to five times the lesser of the height or width dimension of a structure or terrain feature, but not greater than 0.5 mi. While GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height, the actual stack height may be greater.

The stack height regulations also allow increased GEP stack height beyond that resulting from the above formula in cases where "plume impaction" occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with "elevated terrain." "Elevated terrain" is defined as terrain which exceeds the height calculated by the GEP stack height formula. Because the terrain in the vicinity of the Clewiston mill site is flat, plume impaction was not considered in determining the GEP stack height for the Clewiston mill.

2.3 SOURCE APPLICABILITY

2.3.1 Pollutant Applicability

Current actual Clewiston mill emissions of PM, SO_2, NO_x, CO, and volatile organic compounds (VOCs) were estimated based on the average fuel usage at the mill for the last 2 calendar years (1981 and 1982). Both bagasse and No. 6 fuel oil were burned at the mill. The fuel usage figures, broken out by boiler, are shown in Table 2-5. Bagasse usage during 1981 and 1982 was similar, but fuel oil usage in 1982 was much lower than in 1981. Also shown in Table 2-5 are the average moisture content of the bagasse, the assumed sulfur content of the bagasse (no bagasse samples have been analyzed at the Clewiston mill), and the estimated sulfur

Table 2-5. Fuel Usage at Clewiston Mill, 1981 and 1982 Calendar Years

Boiler	Bagasse Usage (tons/yr)* 1981	1982	Average	Fuel Oil Usage (gal/yr) 1981	1982	Average
1	145,040	129,508	137,274	174,600	137,300	155,950
2	122,115	117,477	119,796	176,700	78,100	127,400
3	66,660	65,462	66,061	113,300	76,100	94,700
5	31,423	28,662	30,043	0	0	0
6	31,981	13,092	22,537	0	0	0
Total	397,219	354,201	375,711	464,600	291,500	378,050
Percent H_2O	52.3	52.0	52.2	--	--	--
Percent Sulfur	0.2†	0.2†	0.2†	2.4	2.4	2.4

* As-fired (wet) basis.
† Sulfur in bagasse not measured at Clewiston mill; assumed value is consistent with all calculations in this application.

Source: U.S. Sugar Corporation, 1981, 1982.

content of the fuel oil based on Belcher Oil information (see Appendix A for fuel analysis data).

Emissions of the criteria pollutants were estimated in a manner consistent with emission estimates for the proposed Boiler 4. Boiler 4 emission estimates are shown in Appendix G, and calculations of current emissions from Boilers 1, 2, 3, 5, and 6 are shown in Appendix H. The emissions are summarized in Table 2-6.

Contemporaneous emission decreases at the Clewiston mill will occur in conjunction with operation of Boiler 4. The east and west pellet mills did not operate in 1982 and 1983 and will remain shut down. Since this reduction in emissions has occurred within the last 5 years, it can be used as an offset in determining PSD applicability. Emission reductions were calculated from actual fuel usage and production rates for the last 2 years of operation (1980 and 1981 for the pellet plants). Supportive calculations are shown in Appendix I.

The estimated emission reductions, the net change in emissions, and PSD significant emission rates are shown in Table 2-6. The Clewiston mill is an existing major source, since emissions of any regulated pollutant exceed 250 tons/year. The net increase in emissions will exceed the PSD significant emission rates for PM, SO_2, NO_x, CO, and VOC. As a result, the proposed modification is a "major" modification under PSD regulations, and these pollutants are required to undergo PSD review, as described in Section 2.2.

Emission estimates for lead and the noncriteria regulated pollutants were not calculated for the current mill conditions. Estimated emissions of these pollutants for the proposed Boiler 4 only, shown in Table 2-7, are all below the PSD significant emission rate, except for arsenic. Any credit for emission reductions would only reduce these amounts. As a result, only arsenic need undergo PSD review. Boiler 4 emissions for these pollutants were calculated based on fuel oil

Table 2-6. Current Emissions, Emission Offsets, and Net Increases in Emissions for Regulated Criteria Pollutants

	Emissions (tons/yr)				
	PM	SO_2	NO_x	CO	VOC
Current Emissions					
Boilers 1, 2, 3, 5, and 6					
Bagasse	431	359	225	359	319
Fuel Oil	3	74	13	1	<1
Total	434	433	238	360	319
Emission Decreases					
Pellet Plants					
Fuel Oil	6	18	3	0.2	<1
Emission Increases					
Boiler 4 (proposed)	238	382	206	298	281
Net Change	+232	+364	+238	+298	+281
PSD Significant Emission Rate	25	40	40	100	40

Note: Does not account for increases for Boilers 1, 2, and 3 due to routine operation such as an increase in operating hours or fuel oil usage.

Source: ESE, 1983.

Table 2-7. Estimated Emissions of Lead and Noncriteria Pollutants for the Proposed Boiler 4

Pollutant	Estimated Emissions (tons/yr)	PSD Significant Emission Rate (tons/yr)
Mercury	0.00008	0.1
Beryllium	0.00017	0.0004
Fluorides	0.00024	3.0
Sulfuric Acid Mist	3.7	7.0
Arsenic	0.0016	0
Lead	0.007	0.6

Note: Emissions of all other regulated pollutants cannot be estimated since no emission factors exist.

Source: ESE, 1983.

consumption only (maximum of 500,000 gallons per year), since no emission factors are available for bagasse burning.

2.3.2 GEP Stack Height

Shown in Figure 2-1 is a layout of the Clewiston mill, detailing building dimensions and elevations. The Boiler House, which houses all of the existing boilers and will also house the proposed Boiler 4, is on the average about 60 feet in height and 101 feet by 303 feet in length. The GEP formula applied to this building yields:

$$HGEP = 1.5H + L = 1.5(60) + 60 = 150 \text{ feet.}$$

The height of the proposed Boiler 4 will be 150 feet and, therefore, will not exceed GEP based upon the Boiler House. Other than the Boiler House, the next most significant structure at the mill which could influence the proposed Boiler 4 stack is the Boiling House. This structure is 90 feet high and 217 feet by 220 feet in length. The GEP height for this building is:

$$HGEP = 1.5H + L = 1.5(90) + 90 = 225 \text{ feet.}$$

The proposed Boiler 4 stack will be less than this height. This building would only influence the boiler stacks for certain wind directions (i.e., from about 280° to 350° and from about 100° to 170° from north).

2.3.3 Ambient Monitoring Exemption

An exemption from the ambient monitoring requirements of PSD regulations may be granted if the net increase in impacts due to the major modification are less than the de minimis impact levels (see Table 2-4). Using the modeling methodology described in Section 5.0, impacts of the proposed Boiler 4 were predicted only for the pollutants subject to PSD and for which a de minimis level exists (i.e., PM, SO_2, NO_x, and CO). The maximum predicted impacts were as follows:

PM: 8 ug/m^3, 24-hour average

SO_2: 52 ug/m^3, 24-hour average

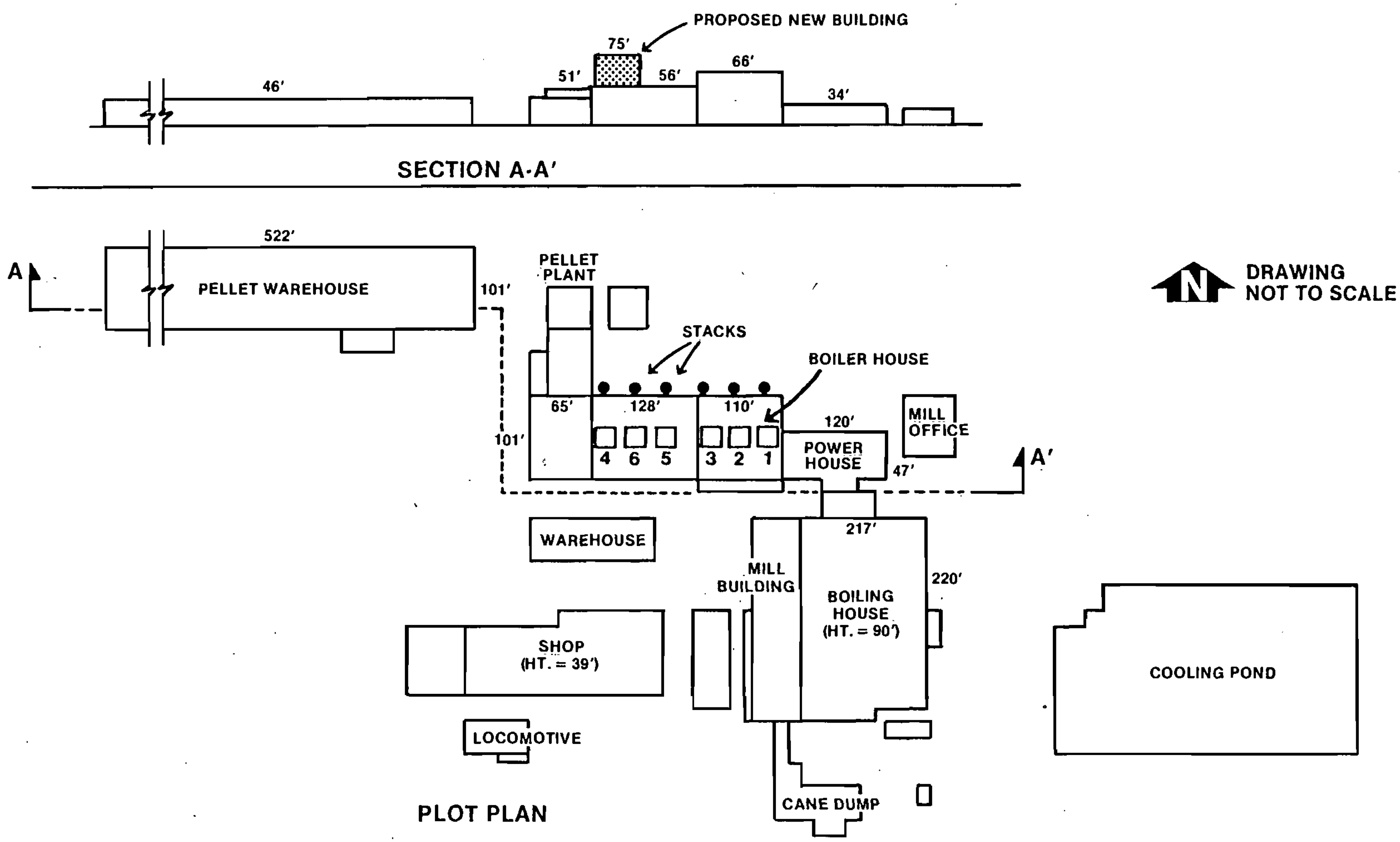

Figure 2-1
PLOT PLAN FOR CLEWISTON MILL

SOURCE: ESE, 1983.

U.S. SUGAR CORPORATION
Clewiston, Florida

NO_x: 0.5 ug/m^3, annual average

CO: 17 ug/m^3, 8-hour average

For PM and CO, these impacts were estimated for total bagasse burning, which results in worst-case emissions. Maximum SO_2 and NO_x emissions and impacts for the proposed Boiler 4 only occur under maximum fuel oil burning conditions, i.e., 150,000 lb/hr steam (225 x 10^6 Btu/hr) due to oil burning with remaining steam capacity supplied by bagasse burning. The estimated exhaust gas flow rate for Boiler 4 burning the maximum amount of fuel oil is shown in Appendix F.

The annual averaging time is specified for the de minimis impact level for NO_x. Maximum actual NO_x emissions from the proposed Boiler 4 are estimated at 206 tons/yr. The SO_2 model run for Boiler 4 only simulates 642.9 lb/hr for Boiler 4, equivalent to 1,404 tons/yr (at 182 days per year operation). Therefore, the annual SO_2 impacts from this model run were ratioed by 206/1,404 to obtain annual NO_x impacts from Boiler 4 only.

As shown above, only SO_2 impacts due to Boiler 4 operation exceed the de minimis impact level. However, total estimated VOC emissions (281 tons/yr) will also exceed the 100 tons per year de minimis level. These pollutants will require an air quality monitoring analysis according to PSD requirements. Impacts of PM, NO_x, and CO are below the de minimis levels and may be granted an exemption from the preconstruction monitoring requirements.

3.0 BEST AVAILABLE CONTROL TECHNOLOGY EVALUATION

The source applicability analysis for the proposed Clewiston Boiler 4, presented in Section 2.0, identified the following emitted air pollutants as requiring a BACT review under federal and state PSD regulations:

Particulate Matter (PM)
Sulfur Dioxide (SO_2)
Nitrogen Oxides (NO_x)
Carbon Monoxide (CO)
Volatile Organic Compounds (VOC)
Arsenic (As)

The State of Florida has received review authority for the federal PSD program (Federal Register, Vol. 48, No. 226, November 22, 1983). In addition, Florida has passed PSD regulations and BACT requirements similar to EPA. DER defines BACT as follows [Ch 17-2.100(22), FAC]:

> An emission limitation, including a visible emissions standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of each such pollutant . . . Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.

The remainder of this section describes the proposed BACT and emission limit for each pollutant subject to BACT. An analysis of alternative control technologies, including economic, energy, and environmental considerations, is also presented.

3.1 PARTICULATE MATTER

3.1.1 Proposed Particulate Matter BACT

On the basis of environmental, energy, and economic impacts, the Western Precipitation (Joy) Turbulaire impingement scrubber, Type D, Size 150, or equivalent design, was selected as BACT for the proposed bagasse/

oil-fired boiler. This system is well demonstrated on existing bagasse/oil-fired boilers in the industry, has a proven operational record with high reliability and low maintenance, and displays low-energy requirements (ΔP = 5 to 9 inches H_2O). The proposed scrubber will operate at a pressure drop of about 5.5 inches H_2O, which is in the range recommended by the manufacturer. Above this range, increased wear of scrubber surfaces, increased particulate entrainment, increased fan capacity, and increased energy input reduce the effectiveness of the system. Water flow rate through the scrubber will be in the range of 200 to 300 gallons per minute (gpm).

In an impingement scrubber, the gas to be cleaned passes through a peripheral nozzle and is guided downward at high velocity into a liquid bath. The level of the liquid bath is maintained slightly below the nozzle by means of an adjustable weir. Collection of flue gas particles is by both direct impaction with the liquid bath and by collision with droplets atomized by the action of the gas stream upon the liquid bath. Mist elimination, achieved by centrifugal action and swirl vanes, precedes gas discharge.

The proposed BACT emission limit for PM when burning bagasse was determined by a source-specific analysis of impingement scrubber performance at the U.S. Sugar Clewiston and Bryant mills. Boilers 1, 2, and 3 at the Clewiston mill were considered in the analysis since these have the same scrubber configuration as the proposed boiler (i.e., scrubber before the I.D. fan). Boilers 5 and 6 at Clewiston have the I.D. fan before the scrubber, and the data from these installations are not considered to be representative of the proposed boiler because the I.D. fan may create smaller particles, making them harder to capture.

Boiler 5 at the U.S. Sugar Bryant mill was also evaluated since the boiler is of the same size as the proposed Boiler 4 (250,000 lb stm/hr) and has an identical spray impingement scrubber (Type D, Size 150). All source tests conducted at Bryant Boiler 5 to date, including those which failed to meet the allowable PM emission rate of 0.15 lb/10^6 Btu, were considered.

Bcilers 1 and 2 at Clewiston have also reached steam production capacities near 250,000 lb/hr. Prior to the 1980-81 crop season, Boiler 3 at Clewiston had the I.D. fan ahead of the scrubber, and therefore these data were not included in the analysis.

A compilation of PM source tests from the identified boilers is presented in Appendix D. All of these tests were conducted while the boilers were burning bagasse with no fuel oil or minimal amounts of fuel oil. The results of a statistical analysis of the PM emission compliance tests are shown in Table 3-1. Compliance tests are the average of three consecutive individual tests. Compliance emission tests at the three Clewiston boilers have ranged from 0.12 to 0.22 lb/10^6 Btu, and averaged 0.17 lb/10^6 Btu. For Bryant 5, the compliance tests results ranged from 0.08 lb/10^6 Btu to 0.23 lb/10^6 Btu, with an average of 0.16 lb/10^6 Btu, close to that of the Clewiston boilers. These wide variations in emission rates make it difficult to define an emission limit which can be met all of the time.

As a minimum, the new boiler must meet an emission limit of 0.2 lb/10^6 Btu when firing bagasse, which is the State of Florida emission limit. This level of emission was therefore used as a starting point in defining the BACT emission limit. To determine the expected frequency of occurrence of excéedance of the 0.2 lb/10^6 Btu level by the new boiler, the statistical data shown in Table 3-1 were utilized. The correlation coefficients shown are for the lines of best fit passed through the data as plotted on a log-probability graph, according to the method of Larsen (1971). The extremely high correlation coefficients (1.0 = perfect correlation) show that the data are essentially log-normally distributed. Therefore, according to Larsen, the following equation is used to relate the value at a particular frequency of occurrence to the geometric mean and standard geometric deviation values:

$$C = MgSg^{Z}$$

Table 3-1. Analysis of Particulate Compliance Tests, U.S. Sugar Clewiston and Bryant Mills

Mill/ Boiler	No. of Tests	Particulate Emissions ($lb/10^6$ Btu) Maximum	Minimum	Average	Geometric Mean	Standard Geometric Deviation	Correlation Coefficient
Clewis-ton/1-3	18	0.22	0.12	0.17	0.17	1.17	0.992
Bryant/5	12	0.23	0.08	0.16	0.16	1.40	0.965

Source: ESE, 1983.

where: C = parameter value at frequency Z,
Mg = geometric mean,
Sg = standard geometric deviation, and
Z = number of standard deviations between the particular frequency and the median.

Rearranging the equation to solve for Z, and using the data in Table 3-1 and a parameter value of C = 0.20 $lb/10^6$ Btu, results in the following:

Clewiston 1-3: Z = 1.04 (85th percentile)
Bryant 5: Z = 0.66 (75th percentile)

This shows that an emission level of 0.2 $lb/10^6$ Btu for the proposed Boiler 4 would be expected to be exceeded 15 percent of the time based upon Clewiston Boilers 1-3 data, and 25 percent of the time based upon Bryant 5 data. These expected frequencies of exceedance are considered marginally acceptable by U.S. Sugar; a lower BACT emission limit is not justified. Therefore, the proposed BACT emission limit for PM when burning bagasse is equal to the State of Florida emission standard of 0.2 $lb/10^6$ Btu. The proposed PM BACT limit when burning fuel oil is 0.1 $lb/10^6$ Btu and is equal to the Florida emission standard for oil burning.

The environmental impact of the proposed Boiler 4 is considered to be small at the proposed BACT emission levels. Maximum PM impacts due to the new boiler are predicted to be 0.4 ug/m^3, annual average, and 8 ug/m^3, 24-hour average. These impacts represent less than 6 percent of the Florida AAQS and less than 25 percent of the allowable Class II PSD increments.

3.1.2 Alternative Particulate Control Technologies

Wet Scrubber Alternatives

Wet scrubbers are the only control devices currently in operation on bagasse/oil-fired steam boilers in the Florida sugar industry. These scrubbers are mainly of the spray impingement type. Venturi scrubbers are also utilized on a few bagasse/oil-fired boilers in Florida. The recently published Background Information document for Nonfossil Fuel-Fired Industrial Boilers (EPA, 1982) shows that wet scrubbers are the only PM control devices currently in use on bagasse-fired boilers in the United States, other than low-efficiency centrifugal collectors. Wet scrubbers are also employed on most wood-fired boilers in the United States. The following is a summary of current scrubber installations on bagasse/oil-fired boilers in Florida.

Mill	No. of Bagasse/ Oil Boilers	No. of Spray Impingement Scrubbers	No. of Venturi Scrubbers
U.S. Sugar Clewiston	5	5	0
U.S. Sugar Bryant	4	4	0
Sugar Cane Growers Coop.	6	6	0
Osceola Farms	5	5	0
Atlantic Sugar Association	5	5	0
Gulf & Western Foods	8	5	3
Talisman	3	0	3
TOTAL	36	30	6

Spray impingement scrubbers represent 83 percent of all scrubbers currently in use, with venturi scrubbers accounting for the remaining 17 percent.

The most important design parameters for scrubbers are the liquid-to-gas ratio (amount of water used per unit volume of gas treated) and the intimacy of contact between the liquid and gas phases. The venturi scrubber and spray impingement scrubber were the wet scrubber designs considered for the Clewiston Boiler 4. These two scrubber types are currently the only types operating in the Florida sugar industry.

In the venturi scrubber, the gases are passed through a venturi throat where low-pressure water is added. Extreme turbulence in the venturi throat atomizes the water into small droplets and promotes intimate contact. The wetted particles and droplets are then collected in a mist elimination device. For a given collection efficiency, these devices normally require a greater pressure drop than the impingement scrubber. In addition, pretreatment mechanical collectors are normally necessary to remove the larger abrasive particles in order to decrease wear on the venturi surfaces.

Fabric Filter

Particulate emission controls via fabric filtration techniques (baghouse) have not been installed on any bagasse-fired boiler. Few full-scale baghouses have been installed on any types of nonfossil-fuel-fired boilers (EPA, 1982). Seven baghouses have been installed on wood-fired boilers, and one on a municipal incinerator. Two of the baghouses on wood-fired boilers have experienced baghouse fires. The principal drawback foreseen by potential users of baghouses is a fire danger resulting from collection of combustible carbonaceous fly ash. The fire potential could possibly be reduced by extensive modifications and precautions, but most such measures have not been demonstrated in actual application, and particularly not on bagasse-fired boilers.

Additional problems with baghouses are plugging, solid waste disposal of a dry product, and potential high maintenance costs for filter replacement. A disadvantage to fabric filtration is its inability to remove other primary gaseous pollutants from the gas stream (i.e., SO_2). Another control device would be required to remove soluble pollutants such as SO_2. Because of the unproven ability of baghouses to operate reliably and effectively on bagasse-fired boilers, they were not considered further in the BACT analysis.

Electrostatic Precipitators

Electrostatic precipitators (ESP) are in operation on wood- and solid-waste-fired boilers. However, they have not been applied to bagasse-fired boilers. Precipitator vendors contacted recently and a study conducted several years ago indicate that electrostatic precipitation of bagasse ash would probably not be feasible. The vendors also caution against possible fire hazard and explosion potential. Information does not exist on the resistivity of bagasse fly ash, and, therefore, the difficulties in collecting the fly ash cannot currently be defined. The Background Information document (EPA, 1982) makes no mention of the suitability of applying ESPs to bagasse boilers.

Particulate collection in an ESP is accomplished by first imparting an electrical charge to the particles, allowing the charged particles to migrate to a collecting electrode, and dislodging the collected particles from the collecting electrodes. Particle charging is normally accomplished with a high-voltage DC corona. Particle removal is performed by rapping or vibrating the collecting electrodes.

ESPs, which must be guarded against corrosion, have the inherent disadvantage of removing only particulate matter. Another control device would be needed to remove soluble pollutants such as SO_2. Disposal of a dry solid waste product would also be required.

Because of the lack of any pilot-plant or full-scale test data on ESPs applied to bagasse boilers, this technology is considered to be unproven and was not considered further in the BACT analysis.

Gravel-bed and Electrostatic Gravel-bed Filtration

The Background Information document (EPA, 1982) identifies gravel-bed filters and electrostatic gravel-bed filters as potentially applicable to bagasse boilers for PM control. These devices remove PM from the gas stream by means of a moving bed of filter media. Electrostatic filters augment the gravel-bed by electrostatically precipitating particles and enhancing collection. However, no such devices have been applied to bagasse boilers in the United States. Since the fly ash is collected in the dry state, the explosion and fire potential exists with this technology as with the baghouse technology. In addition, the effectiveness of an electrostatic filter to enhance PM collection is questionable. The Background Information document states that "very little data are available to assess the factors affecting the performance of gravel-bed filters and electrostatic gravel-bed filters" (pg. 4-41). Because of the unproven ability of these devices on bagasse boilers, they were not considered further in the BACT analysis.

3.1.3 Alternatives Analysis

The preceding section (3.1.2) showed that, of the alternative control technologies, only the venturi scrubber has been proven on bagasse-fired boilers. A venturi scrubber was not chosen for BACT because it has not proven to be a more efficient control device than the spray impingement scrubber. BACT guidelines do not require further analysis of alternative control systems which cannot achieve a greater degree of emission reduction than the proposed BACT. The venturi is also considerably more expensive to install and operate, requires a greater pressure drop (2 to 3 times that of the impingement scrubber), with a correspondingly greater energy consumption, and requires more water. The higher maintenance costs are due to the abrasive nature of the fly ash and high gas velocities encountered in the venturi and across the exhaust fan, which accelerates wear of exposed surfaces. Venturis must be preceded by mechanical collectors to reduce wear, which further increases capital and operating costs of the system.

Venturi scrubbers are currently operating on a total of six boilers in the Florida sugar industry. Table 3-2 summarizes annual compliance tests for each of these scrubbers. At both Gulf & Western and Talisman, mechanical cyclone collectors precede the venturi scrubbers in order to remove larger particles. At Gulf & Western, the venturi scrubber typically operates at a pressure drop of 16 inches H_2O. At Talisman, the venturis operate typically at 14 inches H_2O pressure drop. As shown, test results have varied widely, ranging from 0.09 lb/10^6 Btu to 0.30 lb/10^6 Btu. The average of all tests for all boilers is 0.20 lb/10^6 Btu. Boiler 6 at Talisman has displayed below average test results, ranging from 0.09 to 0.15 lb/10^6 Btu and averaging 0.13 lb/10^6 Btu. The data show that the venturi scrubbers have not achieved a greater degree of emission reduction than that achieved with the impingement scrubber.

Table 3-2. Florida Sugar Industry Venturi Scrubber Compliance Tests

Boiler	Test Date	Particulate Emissions lb/hr Actual	Particulate Emissions lb/hr Allowable	Particulate Emissions lb/10^6 Btu Actual	Particulate Emissions lb/10^6 Btu Allowable
		GULF & WESTERN FOODS			
10	1979-80	43.1	39.2	0.22	0.3
10	1980-81*	31.2	46.2	0.14	0.2
10	1-6-82	53.3	45.8	0.23	0.2
11	1979-80	35.4	45.1	0.16	0.2
11	1980-81	53.0	51.1	0.21	0.2
11	1980-81	34.7	47.7	0.15	0.2
11	12-10-81	53.5	44.1	0.24	0.2
11	12-14-82	39.3	48.0	0.16	0.2
15	1-10-83	44.6	54.0	0.17	0.2
		TALISMAN			
4	1-6-76	58.0	61.5	0.28	0.3
4	2-2-77	54.4	61.2	0.27	0.3
4	1-25-78	64.6	66.6	0.29	0.3
4	12-18-78	25.7	44.7	0.17	0.3
4	2-13-80	49.6	56.0	0.27	0.3
4	1-28-81	42.7	59.1	0.22	0.3
4	1-27-82	51.1	68.0	0.23	0.3
4	2-21-83	26.8	67.4	0.12	0.3
5	1-6-76	56.9	63.5	0.27	0.3
5	2-25-77	43.7	50.7	0.26	0.3
5	1-20-78	38.0	38.3	0.30	0.3
5	12-20-78	38.6	44.2	0.26	0.3
5	2-7-80	46.8	59.0	0.24	0.3
5	2-2-81	52.4	57.3	0.27	0.3
5	2-12-82	58.8	72.6	0.24	0.3
5	2-12-83	43.9	77.2	0.17	0.3
6	1-26-76	31.5	73.5	0.09	0.2
6	1-27-78	45.2	86.0	0.11	0.2
6	1-3-79	43.9	72.7	0.12	0.2
6	2-11-80	59.3	84.6	0.14	0.2
6	2-4-81	61.2	80.2	0.15	0.2
6	2-11-82	64.0	110.9	0.12	0.2
6	2-11-83	76.2	99.1	0.15	0.2

* Modified to vertical orientation this season.

Source: ESE, 1983.

3.2 SULFUR DIOXIDE

The analysis presented in Appendix E shows that the spray impingement scrubber, which is the selected PM BACT control device, will also remove 60 percent or more of the SO_2 in the boiler exhaust gas system. The pH of the scrubber water used at the Clewiston mill has been measured in the range of 7 to 8, which is alkaline to neutral, and theoretically should absorb SO_2 from the gas stream.

The SO_2 test data from bagasse boilers also show a significant reduction in theoretical SO_2 emissions elsewhere in the process, resulting in overall reduction of greater than 90 percent of the theoretical amount of SO_2. This additional reduction probably takes place in the boiler, where the bottom ash and fly ash absorb the SO_2.

Because of the high inherent removal efficiency of the spray impingement scrubber (when scrubber water of about pH 7 or above is used and the fact that the scrubber is already required for PM removal, this technology is chosen as BACT for SO_2 when firing bagasse in the proposed Boiler 4. The corresponding BACT emission limit is 0.25 $lb/10^6$ Btu due to bagasse firing.

No other available SO_2 control techniques, such as flue gas desulfurization (FGD), can reliably reduce SO_2 flue gas concentrations by 90 percent and greater. An FGD system applied to the proposed boiler would have a capital cost of greater than $2 million and annual operating and maintenance costs of greater than $1 million. Such a system would have little air quality benefit, owing to the relatively low impacts of the proposed Boiler 4 only, would create a significant solid and liquid waste problem, and would consume a a significant amount of energy.

A 50-percent SO_2 control efficiency due to the spray impingement scrubber was assumed in developing emission rates and air quality impacts for the new boiler. When burning bagasse, actual SO_2 emissions are expected to be much lower. A conservative 50-percent SO_2 reduction was also assumed for the existing boilers at Clewiston.

The proposed BACT for fuel oil firing is the minimization of the use of No. 6 fuel oil with a maximum sulfur content of 2.5 percent. The intent of U.S. Sugar Corporation has and always will be to minimize the burning of fuel oil in the existing boilers as well as the proposed Boiler 4. For example, during 1982 fuel oil provided less than 2 percent of the Clewiston mill's total heat input requirements. Oil is normally required for starting up the boilers at the beginning of the crop-year (generally requires less than 24 hours). After startup, oil will only be fired when the supply of bagasse to the boiler is interrupted.

Bagasse is a waste product and is free fuel. Oil is very costly; therefore, pure economics dictate an absolute minimization of fuel oil usage. The permit application allows for up to 500,000 gallons per year of fuel oil to be burned in the proposed boiler. Actual fuel oil usage is expected to be well below this level. The fuel oil usage in 1982 for the entire Clewiston mill was only 291,500 gallons.

The SO_2 emissions due to oil firing are also conservatively estimated in the application, since no SO_2 removal across the spray impingement scrubbers was assumed. Only limited test data currently exist for the Florida sugar cane industry on SO_2 removals while burning oil (see Appendix E), partly because such tests are very costly in terms of fuel cost. But owing to the alkaline nature of the scrubber water, it is likely that significant SO_2 removal does occur when firing oil.

The firing of a lower sulfur content fuel oil in the proposed boiler (i.e., 1.0 percent) is an alternative control technology for SO_2 when firing fuel oil. Such a control technology would be more costly to U.S. Sugar Corporation, owing to the differential between 2.5- and 1.0-percent sulfur fuel oil, which is currently $3/bbl, but could be substantially higher in the future. Such a technology also would not result in significant environmental benefits, since the amount of fuel oil in the proposed boiler will be minimized, and because the existing bagasse/oil-fired boilers at the Clewiston mill (Boilers 1, 2, and 3) will continue to use 2.5-percent (maximum) fuel oil in the future.

3.3 NITROGEN DIOXIDE

3.3.1 Proposed Nitrogen Dioxide BACT

The proposed BACT for NO_x is good firing and operational practices applied to the bagasse/oil-fired boiler. The boiler U.S. Sugar Corporation is procuring for Boiler 4 was originally developed to burn coal and gas (see Appendix B). As a result, modifications to the boiler must be made to accommodate bagasse and oil. The stoker will be of the traveling-grate type. The proposed BACT emission limit is 0.17 lb/10^6 Btu when firing bagasse and 0.45 lb/10^6 Btu due to oil firing, which are the estimated uncontrolled emissions when burning these fuels.

3.3.2 Available Nitrogen Oxides Control Techniques

Several techniques for controlling NO_x formation in boilers are currently available. These include:

1. Low excess air firing,
2. Staged combustion,
3. Flue gas recirculation,
4. Low NO_x burners, and
5. Ammonia injection.

Most of these techniques are not applicable to bagasse-fired boilers. Low NO_x burners cannot be used when burning material such as bagasse in a spreader-stoker or traveling- grate boiler. Excess air, typically in the range of 30 to 50 percent for these boilers, is required to aid in drying of the moisture-laden carbonaceous material and to ensure complete combustion. The low combustion temperatures encountered in bagasse-fired boilers inherently limit potential NO_x formation, as does the low nitrogen content of bagasse (typically 0.3 percent).

The Background Information document (EPA, 1982) states that NO_x controls have not been applied to nonfossil fuel boilers because of their relatively low NO_x emissions. Further, comprehensive test data substantiating the performance of NO_x control techniques for bagasse boilers and bagasse/oil-fired boilers are not available.

Some limited NO_x test data are available from the Florida sugar industry boilers (Table 3-3). One test, performed by Monsanto Research Corporation (1980) at the U.S. Sugar Bryant mill, showed very low levels of NO_x, averaging 0.0018 $lb/10^6$ Btu when burning bagasse. Tests conducted on Sugar Cane Growers Cooperative Boiler 8, when deducting NO_x contributions due to oil burning, resulted in higher bagasse NO_x emissions, averaging 0.084 $lb/10^6$ Btu. NO_x testing has also been conducted at Osceola Farms Boiler 6, but these test data were not available for this analysis. However, the available data indicate that the AP-42 emission factor used in this application for Clewiston Boiler 4 is very conservative.

Based upon the above considerations, good firing and operational practices are considered to be best BACT for reducing NO_x emissions. Therefore, no other technologies were considered further.

3.4 CARBON MONOXIDE AND VOLATILE ORGANIC COMPOUNDS

The selected BACT for the control of CO and VOC emissions from the boilers are good boiler design and operation and good firing practices. There are no known feasible, economic post-combustion controls for these pollutants for fossil or nonfossil-fuel-fired boilers. Promoting complete combustion in the boiler is the only feasible method for reducing VOC and CO emissions. However, it is cautioned that such measures, which include high excess air firing, tend to increase NO_x emissions. The boiler will be designed for maximum efficiency, which is directly related to the most complete combustion possible.

Table 3-3. Summary of NO_x Emission Tests on Bagasse Boilers in the Florida Sugar Industry

Boiler	Date	Steam Load (lb/hr)	NO_x Emissions lb/hr	NO_x Emissions $lb/10^6$ Btu
		U.S. SUGAR BRYANT		
2	12-17-79	142,000	0.23	0.0013
2	12-18-79	151,000	0.38	0.0020
2	12-18-79	144,000	0.42	0.0022
		SUGAR CANE GROWERS COOP		
8	2-4-83	246,429	43.1 (65.5)*	0.104
8	2-4-83	243,250	29.2 (53.4)*	0.072
8	2-4-83	254,211	32.3 (55.8)*	0.076

* Figures shown are NO_x attributable to bagasse firing. Number in parentheses is total NO_x attritable to bagasse and oil firing. Approximately 55 x 10^6 Btu/hr due to oil firing during tests, and 415 x 10^6 Btu/hr due to bagasse firing. NO_x due to oil firing based upon AP-42 factor of 67 $lb/10^3$ gal is deducted from total NO_x.

Source: ESE, 1983.

The proposed BACT emission limits for CO are 0.25 lb/10^6 Btu when firing bagasse and 0.033 lb/10^6 Btu when firing oil. For VOC, the limits are 0.24 lb/10^6 Btu when firing bagasse, and 0.0070 lb/10^6 Btu when firing oil. These emission factors are based on data for wood-waste and oil firing (see Appendix G).

3.5 ARSENIC

Because arsenic is a trace substance and is emitted as a solid particulate from oil burning, the proposed wet spray impingement scrubber which controls PM emissions will also control arsenic emissions. The wet scrubber is the proposed BACT, and the small emissions of this pollutant do not justify a more stringent control. The proposed BACT emission rate is 41.9 lb/10^{12} Btu heat input due to oil.

4.0 AIR QUALITY (MONITORING) ANALYSIS

4.1 MONITORING REQUIREMENTS

The Clean Air Act Amendments of August 1977 require that the owner of any proposed major air pollution source conduct ambient air monitoring for applicable pollutants for a period of 1 year prior to submission of a construction permit application. The use of existing representative data may be permitted in lieu of monitoring, provided the data meet EPA PSD monitoring criteria.

As determined by the source applicability analysis, SO_2 and VOC (ozone) require an ambient monitoring analysis under PSD regulations. However, PM monitoring data are also needed to estimate a background PM air quality concentration level. The background concentration will be added to modeled impacts in Section 5.0 to determine total maximum PM air quality levels. Each of these pollutants is addressed in the following sections.

4.2 TOTAL SUSPENDED PARTICULATE (TSP)

The Florida Sugar Cane League (FSCL) operates and maintains a PSD-approved ambient monitoring network in the Florida sugar industry area. The monitoring network was approved by the Florida DER in September 1982 (see Appendix J) and began collecting PSD acceptable data in October 1982. The two PSD stations located within 10 km of the Clewiston mill (#7 and #19) are shown in Figure 4-1.

Station #7 is located atop the FSCL offices in Clewiston, about 2 km north of the Clewiston mill. Station #19 is located about 10 km due south of the mill, surrounded by sugar cane fields. These two stations are considered appropriate for determining a representative background TSP concentration.

The TSP data collected through December 8, 1983, at the two stations are summarized in Table 4-1. Station #7 reflects moderate maximum 24-hour concentrations, but a rather high arithmetic mean and geometric mean,

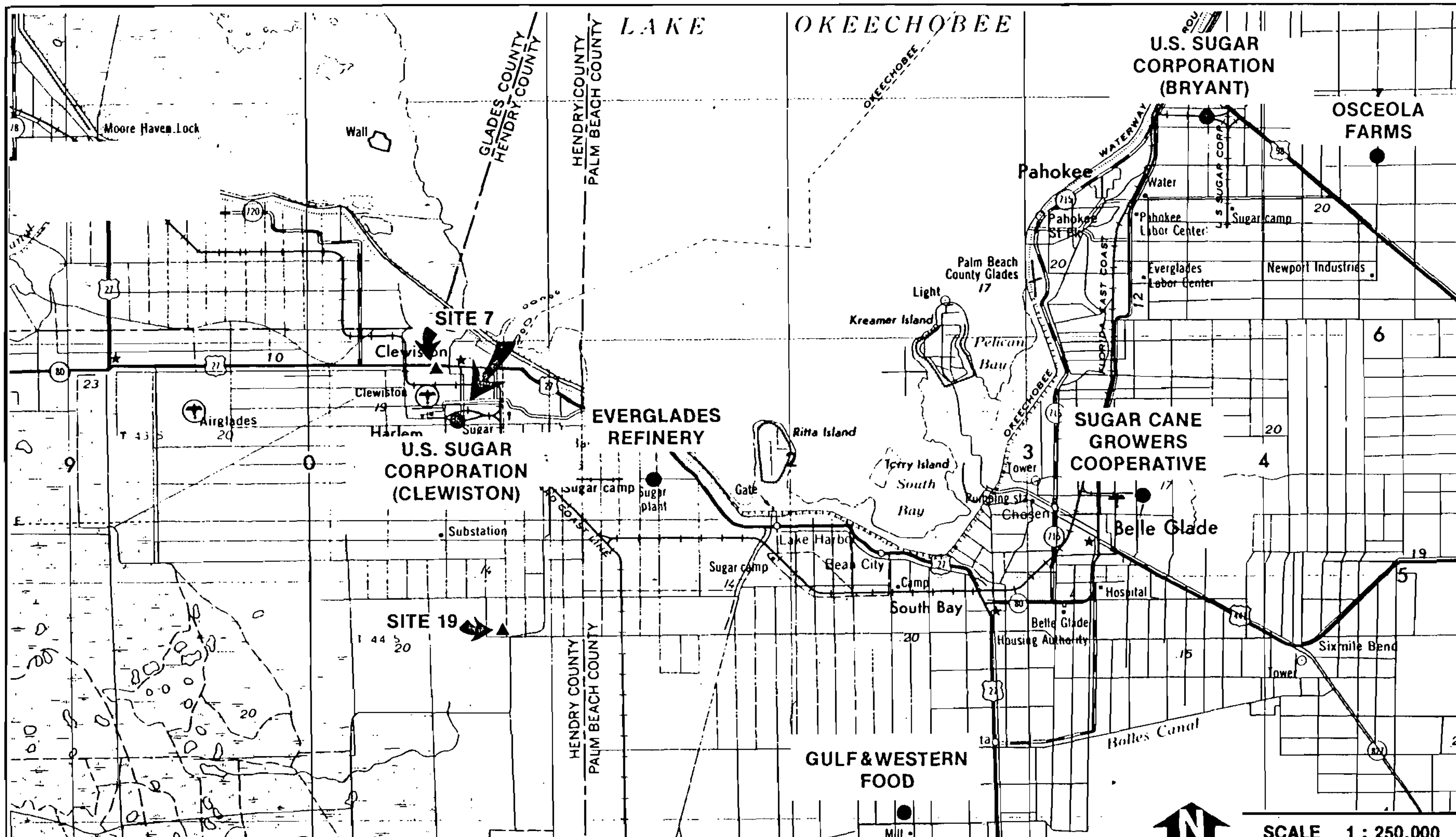

Figure 4-1
LOCATIONS OF TSP MONITORING SITES WITHIN 10 KILOMETERS OF CLEWISTON MILL

SOURCE: ESE, 1983.

U.S. SUGAR CORPORATION
Clewiston, Florida

Table 4-1. Summary of 24-hour TSP Monitoring Data (ug/m^3), FSCL Stations #7 and #19, October 1982 to December 1983

Station	No. of Obs.	Maximum	Second Highest	Arithmetic Mean	Geometric Mean
7	71	113	107	50	47
19	61	214	194	49	41

Source: ESE, 1983.

likely an effect of the vehicular traffic in the Clewiston area. This station also should experience influence from the Clewiston mill, since it is located only 2 km away.

Station #19, located in a remote area about 10 km south of the Clewiston mill, experienced two TSP values above the Florida AAQS of 150 ug/^{3}. A third value close to the standard was also experienced (142 ug/m^3), but all other 24-hour concentrations were less than 100 ug/m^3. The two highest measured values were attributed to sugar cane field fires. The third high value (142 ug/m^3) is also thought to be due to field fires. The station should not be influenced significantly by the Clewiston mill due to its distance from the mill. Since the station is located in an area devoid of human residences, the high measured levels are not of as much concern as if they had occurred in Clewiston.

If the three highest values recorded at Station #19, all believed to be due to cane fires, are discarded from the data set, the resulting arithmetic mean concentration becomes 42 ug/m^3. A representative background concentration was considered to be the average of this value and the arithmetic mean recorded at Clewiston (50 ug/m^3), or 46 ug/m^3. This concentration was used for both the annual average background and the 24-hour background concentration. The estimated background concentrations will be added to dispersion modeling results in Section 5.0. The dispersion models considered all significant PM sources located within 50 km of the Clewiston mill.

4.3 SULFUR DIOXIDE (SO_2)

SO_2 monitoring has been conducted by the FSCL as part of the PSD monitoring network described in Section 4.2. The network consists of one continuous monitor located in Belle Glade. The data obtained from the station were not available for this report, but could be made available in the near future if deemed necessary by the Florida DER. No other PSD acceptable data are known to be available for the sugar industry area.

For modeling purposes, an SO_2 background concentration of 20 ug/m^3 was assumed. Because the emission inventory used in the dispersion modeling analysis considered all significant SO_2 sources within 50 km of the Clewiston mill, this background level is considered to be conservative.

4.4 OZONE (O_3)

Ambient ozone monitoring has been conducted by the FSCL as part of the PSD-approved monitoring network. The network consists of one continuous O_3 monitor located in Belle Glade. The data obtained for this station were not available for this report, but could be made available in the near future if deemed necessary by the Florida DER.

No recognized techniques exist for estimating impacts upon O_3 levels due to VOC emissions from the proposed Boiler 4. Therefore, it is not necessary to develop a background O_3 concentration.

5.0 SOURCE IMPACT ANALYSIS

5.1 EMISSIONS INVENTORY

The area within 50 km of the Clewiston mill was inventoried for point sources of particulate and SO_2 emissions. The basis for this inventory was the 1981 Air Permit Inventory System (APIS); information on file at ESE's offices in Gainesville, Florida; previous PSD impact studies performed by ESE for other sugar mills; and information on file at DER's Ft. Myers office. Maximum allowable or permitted emission rates were used in the inventory.

The inventory includes all the sugar mills and sugar refineries in Palm Beach and Hendry Counties, the Florida Power & Light Martin generating station (Units 1 and 2), and additional sources in Belle Glade. All sources located in West Palm Beach were excluded from the inventory because they were well beyond the 50-km distance. The emission inventory for the Clewiston mill was presented in Section 1.0 for PM and SO_2 emissions.

5.2 DISPERSION MODELS AND METEOROLOGY

Both short-term (i.e., 24-hours or less) and long-term (crop-season) impacts were predicted with the Industrial Source Complex short-term model. The model is a DER- and EPA-approved Gaussian dispersion model. Rural dispersion characteristics and default input parameters were used in the model.

Five years (1970 to 1974) of historical surface meteorological data recorded at West Palm Beach Airport were used in the model analysis. Upper atmosphere observations were recorded at Miami for the same time period. Only the period from 15 October through 15 April was modeled to reflect the seasonal operation of the plant (182 crop-days per year).

The 182-day average impact results produced by the model were divided by two to reflect the annual average impact. Appropriate background air quality levels, developed in Section 4.0, were added to modeled concentrations to predict total air quality impacts. Since 5 years of meteorological data were used, highest, second-highest short-term impacts were identified for comparison to air quality standards.

Initial modeling with 5 years of meteorological data was performed for emissions from the Clewiston mill only. The critical meteorology and approximate location of highest, second-highest concentrations were determined with a radial receptor grid covering 36 directions every 300 meters from the plant center, with all Clewiston boilers portrayed as colocated. The impacts were refined with receptors within a 1-km square grid and placed at 100-meter intervals. All sources in the emission inventory were included in all refined modeling runs.

5.3 IMPACT ANALYSIS RESULTS

5.3.1 Particulate Matter

The results of the PM source impact analysis are summarized in Table 5-1. Maximum annual and highest, second-highest 24-hour impacts are shown for the proposed Boiler 4 only, for the Clewiston mill with Boilers 1 through 4 operating, for all modeled sources, and for the total predicted impacts due to all modeled sources plus the background air quality level. Maximum Boiler 4-only impacts, reflecting total bagasse burning and maximum PM emissions, are shown to be relatively low, representing less than 6 percent of the Florida AAQS.

The maximum 24-hour "all sources" impact is only slightly higher than the "Clewiston mill" impacts, indicating that other modeled sources do not contribute significantly under the worst-case meteorologial conditions. The maximum total predicted 24-hour PM impact is predicted to be 149 ug/m^3, which is below the Florida AAQS of 150 ug/m^3. The maximum total annual average impact is 52 ug/m^3, which is well below the AAQS of 60 ug/m^3. These impacts reflect the worst-case Clewiston mill PM emissions scenario described in Section 1.0.

Table 5-1. Particulate Matter Impact Analysis Results

Scenario	Averaging Time: Annual* Concentration (ug/m^3)	Annual* Distance (m)	Annual* Direction (degrees)	24-Hour† Concentration (ug/m^3)	24-Hour† Year/Day	24-Hour† Distance (m)	24-Hour† Direction (degrees)
Proposed Boiler 4 Only	0.4	1,800	260, 270	8	1971/319	1,800	260
Clewiston Mill with Boiler 4 Operating	5.9	900	260	102	1971/327	900	260
All Modeled Sources with Boiler 4 Operating	—	—	—	103	1971/327	900	260
Total Impacts with Boiler 4 Operating**	51.9	900	260	149	1971/327	900	260
Interaction Cases††							
Gulf & Western/Talisman				75	1973/21	900	320
U.S. Sugar Bryant/ Osceola Farms				99	1972/306	900	250
Sugar Cane Growers/ Florida Refinery				65	1970/61	900	280
Atlantic/Everglades Refinery				86	1973/65	1,200	290
FPL Martin				82	1974/314	900	230

* 1982-day average, as predicted by model, divided by 2.
† Highest, second-highest impacts from 5 years of meteorological data.
** Includes a 46-ug/m^3 background concentration; see Section 4.0 for derivation.
†† Does not include estimated background concentration

Source: ESE, 1983.

The possibility of 24-hour interaction of the Clewiston mill with surrounding sources to produce higher concentrations was also investigated. The critical meteorology in the directions aligning the significant sources was determined. Maximum concentrations were determined in these interacting directions with the critical meteorological conditions. Table 5-1 also gives the results of this investigation. It is seen that no source interactions occur which produce higher concentrations than those due to the Clewiston mill alone.

5.3.2 Sulfur Dioxide

The results of the SO_2 impact analysis are shown in Table 5-2. As for the PM analysis, results are shown for various source scenarios. Maximum predicted Boiler 4 impacts are only 20 percent of the Florida AAQS for SO_2. These impacts were predicted assuming maximum fuel oil burning for each day of the crop season, which is a very conservative assumption since Boiler 4 will be limited to 500,000 gal/yr of fuel oil consumption.

As with the PM results, highest, second-highest 24-hour "all sources" impacts are only slightly higher than the "Clewiston mill" impacts, indicating negligible contribution from other modeled sources during the specified meteorological conditions. These impacts reflect the worst-case Clewiston mill 24-hour and 3-hour SO_2 emission scenarios described in Section 1.0. The total predicted 24-hour SO_2 impact, including background, is 248 ug/m^3, compared to the AAQS of 260 ug/m^3. The predicted maximum total annual average SO_2 impact is 32.5 ug/m^3, which is roughly one- half of the AAQS of 60 ug/m^3. The predicted maximum total 3-hour SO_2 impact, including background, is 590 ug/m^3, compared to the AAQS of 1,300 ug/m^3.

SO_2 interaction case results are also shown in Table 5-2. As in the case of the PM interactions, the SO_2 interaction concentrations are all below those produced due to the Clewiston mill alone.

Table 5-2. Sulfur Dioxide Impact Analysis Results

	Averaging Time										
	Annual*			24-Hour†				3-Hour†			
Scenario	Concentration ($\mu g/m^3$)	Distance (m)	Direction (°)	Concentration ($\mu g/m^3$)	Year/Day	Distance (m)	Direction (°)	Concentration ($\mu g/m^3$)	Year/Day/Period	Distance (m)	Direction (°)
Proposed Boiler 4 Only Maximum Impact***	3.1	1,500	260	52	1974/74	1,600	270	161	1972/297/5	900	280
Clewiston Mill with Boiler 4 Operating	12.5	900	260	227	1971/327	900	260	569	1971/105/1	900	270
All Modeled Sources with Boiler 4 Operating	—	—	—	228	1971/327	900	260	570	1971/105/1	900	270
Total Impacts with Boiler 4 Operating**	32.5	900	260	248	1971/327	900	260	590	1971/105/1	900	270
Interaction Cases††											
Gulf & Western/ Talisman				163	1973/21	900	320	593	1973/329/5	900	320
U.S. Sugar Bryant/ Osceola Farms				212	1972/306	900	250	562	1972/94/5	900	250
Sugar Cane Growers/ Florida Refinery				147	1970/61	900	280	553	1972/297/5	600	280
Atlantic/Everglades Refinery				190	1973/65	1,500	290	495	1972/57/5	900	290
FPL Martin				187	1974/314	1,200	230	565	1973/294/8	1,200	230

* 182-day average, as predicted by model, divided by 2.
† Highest, second-highest impacts from 5 years of meteorological data.
** Includes estimated background concentration of 20 $\mu g/m^3$; see Section 4.0 for derivation.
†† Does not include estimated background concentration of 20 $\mu g/m^3$.
*** Reflects maximum fuel oil burning and maximum SO_2 emissions.

Source: ESE, 1983.