Bill
I believe this is
what we need.
Clair

MAY 1981
RECEIVED

May 7, 1981

HAND DELIVERY

Mr. Clair Fancy
Chief, Permitting Section
Bureau of Air Quality Management
Department of Environmental Regulation
Twin Towers
2600 Blair Stone Road
Tallahassee, FL 32301

Re: Boiler No. 8/Sugar Cane Growers Cooperative/
Federal PSD Permit Application

Dear Mr. Fancy:

Pursuant to our conversation at the meeting today, we are herewith requesting that the Florida Department of Environmental Regulation process the Permit Application and Prevention of Significant Deterioration Report, dated April, 1981, as an application for a federal PSD permit. It is our understanding that this application will be processed concurrently with the application for a Florida PSD permit, supported by the same document, filed on April 24, 1981 with the South Florida District Office of the Department. We intend to supplement both of these applications in the near future with a proposed compliance plan.

Please feel free to call David Buff of Environmental Science and Engineering or Bill Green with any questions you might have with regard to the attached.

Your continued cooperation in the expeditious processing of this application is greatly appreciated.

Very truly yours,

Enrique R. Arias

Enrique R. Arias
Executive Vice President
Sugar Cane Growers Cooperative
of Florida
Post Office Box 666
Belle Glade, Florida 33430

djp

cc: Michael Martin
Mirza P. Baig
Steve Smallwood

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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

May 21, 1981

Mr. Enrique R. Arias
Executive Vice President
Sugar Cane Growers
Cooperative of Florida 33430

Dear Mr. Arias:

RE: Federal PSD Permit Application, PSD-FL-077

The Department has received your application for a permit to construct a boiler at the Sugar Cane Growers Cooperative (SCGC) mill in Palm Beach County, Florida. Based on our initial review of your proposal, it has been determined that additional information is needed before we can process the application. The information required to complete the application is listed below.

1. Provide actual monthly fuel oil consumption during 1979 and 1980 for each existing boiler (units 1 to 7).

2. Is any plant expansion that would increase air pollutant emissions planned in conjunction with the proposed boiler?

3. Are applications for the proposed modifications to boiler #4, #6, and #7 prepared?

4. Is 5 days/week operation correct (Section II.F)? Seasonal operation from November through March does not reflect 184 crop season days; please explain.

5. Provide a copy of the boiler manufacturer's performance specification addressing excess air, oil burner capacity, steam temperature and pressure, construction and predicted performance data, etc.

6. Explain why the system's SO_2 loss (Attachment A-1) is 40% for bagasse residue but 0% for fuel oil. The test results of boiler #2 while burning 100% residue (Table C-1) indicate 27% SO_2 loss, not 40% loss. Are more stack test data available to substantiate the 40% SO_2 removal efficiency?

7. Provide fuel analysis reports on bagasse (wet and dry), bagasse residue (wet and dry) and fuel oils. All analyses should be based on actual fuel used. Based on the attached analysis reports, the sulfur contents of bagasse and residue are 0.2% and 0.63% respectively. Average density and heating value for No. 6 fuel oil (information from Belcher Oil Co.) are 7.7 lbs/gal and 18,780 Btu/lb for 1% S oil; 8.22 lbs/gal and 18,330 Btu/lb for 2.4% S oil. Values in Attachment A-1; Tables A-1, A-2 and A-3 in Appendix A; and inputs to the computer modeling could be affected by any changes in the fuel analysis reports.

8. The calculations of particulate matter and NO_x emissions while burning 100% residue (Attachment A-2) are not correct. The factor of 1 ton wet/0.45 ton dry is for bagasse, not for residue.

9. In Attachment A, 1% S fuel oil is used for emission calculations. We believe the actual fuel used will contain 1.8% S. Recalculate using analysis of actual fuel proposed.

10. What is the size of fuel oil tank and the maximum oil supply flow rate from the tank?

11. Does the average fuel consumption represent the normal fuel mix? Explain why the total heat input to the boiler will vary for different fuels. How is maximum heat input controlled for each fuel burned?

12. Describe equipment used to feed bagasse and residue to the boiler. What methods will be used to measure oil, bagasse and residual feed to the boiler?

13. What are the SO_2 emission results of the tests for the bagassee-burning boilers conducted by EPA at the U.S. Sugar Mill in Clewiston during the 1978 to 1979 crop season (Attachment C)?

14. What is the basis for using the same particulate removal efficiency for the four different types of control systems (Table D-3)? Provide information on the particulate matter emission size distribution from the boiler.

15. Provide the scrubber I.D. fan operating curve. Include the fan speed (R.P.M.), motor H.P. and amperage of the exhaust fan at designated conditions. What are the temperature and pressure of the flue gas at the scrubber I.D. fan?

16. Will any additives be used while burning oil?

17. What happens to the bagasse at the furfural extraction plant? (If possible, avoid confidential information in your answer). Why are the ash and sulfur contents higher in residue than in bagasse?

18. What are the maximum emissions of all criteria pollutants and heat input rates for each existing boiler? List information in a table.

19. How will fugitive particulate matter emissions from the storage and transfer of excess bagasse be controlled?

20. Provide a letter from the scrubber manufacturer on the performance of the scrubber giving efficiency and the particulate emission limits (pounds per million Btu heat input) which can be met for varying particle sizes.

21. What pressure drop, water pressures, and flow rates will be used by the proposed scrubber? Provide a drawing of the scrubber showing all internal components, water piping, etc.

22. Furnish a drawing of the stack configuration indicating sampling port locations, safety platforms, inlet ducting, etc.

23. Give similar information and drawings, as mentioned above, for the proposed stacks for boilers #4, #6, and #7.

24. Give the control efficiency, cost, and inlet and outlet loadings of the multi-cyclone dust collector which was not specifically addressed as part of the control equipment in the application.

25. Provide a drawing of the boiler, dust collector and wet control device as proposed to meet the emission limitation.

26. Are the flow rates (ACFM) used in Table 2-4 based on design conditions or actual stack testing reports? For all boilers the ACFM value in the stack test reports is different from the ACFM mentioned in the original permit application; please explain.

27. The following sources within 50 km of SCGC were not included in the computer modeling contained in Appendix C. Please include them in the modeling or explain why they should not be included.

SO_2 Sources

Gulf and Western, Boiler #14 (pt. 12)
Osceola Farms, Boiler #5 (pt. 05)
Proposed Boiler #6 (pt. 06)

Florida Sugar Refinery, Kiln (pt. 03)
U.S. Sugar Corp. - Bryant, Boiler #1 (pt. 01)
Boiler #2 (pt. 02)
Boiler #3 (pt. 03)

Talisman Sugar, Boiler #4 (pt. 04)
G.C.I. Cannery, Boiler #1 (pt. 03)
#2 (pt. 04)

City of Pahokee Incinerator (pt. 01)
(pt. 02)

Pratt & Whitney, All Points
F.P.L. - Martin, Boiler #1 (pt. 01)
Boiler #2 (pt. 02)

TSP Sources

Gulf and Western, Boiler #9 (pt. 08)
Florida Sugar Refinery, Boiler #1 (pt. 01)
Boiler #2 (pt. 02)

U.S.S.C. - Bryant, Boiler #4 (pt. 04)
Pratt and Whitney, All Points
F.P.L. - Martin, Boiler 1 (pt. 01)
Boiler 1 (pt. 02)

Everglades Sugar Refinery, Boiler (pt. 02)
New Haven Sugar, Inc., Milling Facility (pt. 01)

29. In Table 2-4 the stack diameter of Boilers 6 and 7 with modifications is given as 7.1 ft (2.16 m). This boiler combination was actually modeled with a diameter of 5.0 ft. (1.52 m). Our calculations show the exit velocity should be 11.00 m/sec, not 22.40 m/sec as shown in the computer printout. The computer printout also seems to mislocate the Everglades Sugar Refinery sources; please explain.

30. Based on the latest EPA ambient monitoring guidelines (Ambient Monitoring Guidelines for Prevention of Significant Deterioration, EPA-450/4-80-012, Section 2), we believe that ESE's procedure to determine a TSP background concentration is not justified. We suggest two alternatives for developing this background. Data collected from the Palm Beach County Health Department (PBCHD) TSP monitor PB-16 could be used. This monitor would be considered a "regional" monitor. Because of its remote location, with the Everglades to the north and Loxahatchee Wildlife Refuge to the south, the impact of cane field burning would probably not be reflected in data from this monitor. Therefore, a modeling analysis of the impact of cane field burning would need to be included in order to supplement the data from PB-16. The other alternative would be to use data from an existing monitor within 10 km of SCGC. PBCHD TSP monitor PB-19 in Belle Glade or Florida Sugar Cane League monitors SL-13 or SL-5 could be used. If a Sugar Cane League monitor were used, the data would have to meet all FDER and EPA quality assurance requirements, and the data would have to be submitted to FDER for verification. Since data from any of these monitors may be impacted by point source emissions from SCGC, the modeled impact of these sources at the location of the monitor could be subtracted out. For either alternative, we suggest that three years of monitor data be used if available.

As soon as we have received the requested information we will continue processing your application. If you have any questions, please contact this office. Cleve Holladay should be contacted on any question related to modeling or ambient monitoring and Willard Hanks on the other information requested.

Sincerely,

Steve Smallwood, P.E.
Chief
Bureau of Air Quality
Management

SS:RK:CH:dav

Attachment

cc: Mirza Baig, South Florida District
Michael Martin, Palm Beach County Health Department
William Green, Hopping, Boyd, Green, and Sams
David Buff, Environmental Science and Engineering

HOPPING BOYD GREEN & SAMS
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GARY P. SAMS

BRIAN H. BIBEAU
CALVIN J. LIVINGSTON
WILLIAM D. PRESTON

OF COUNSEL,
W. ROBERT FOKES
JOHN C. WHITE

May 29, 1981

MAY 1981
BUREAU
A Q M

HAND DELIVERED THIS DATE

Steve Smallwood, P.E.
Chief, Bureau of Air Quality Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: Federal PSD Permit Application, PSD-FL-077

Dear Mr. Smallwood:

Please find attached the response of the Sugar Cane Growers Cooperative (SCGC) to the information request received from yourself by letter dated May 21, 1981. Each of your questions is, in our opinion, fully addressed with the exception of No. 30 relating to assumed background levels of total suspended particulate matter. Representatives of SCGC have discussed this matter with Larry George and Cleve Holladay and have been advised that Question 30 will be the subject of further discussions and an answer to it is not needed at this time for the application to be deemed complete.

It is our understanding that upon receipt of the attached information, the Department can now determine that SCGC's application for the above referenced permit is complete. We request at this time that this determination be made, effective today, and forwarded to us for our files at your convenience. Of course, the primary reason for this request is SCGC's desire to achieve certainty and to avoid delays, in view of changing regulatory requirements.

In order to facilitate your review and to further supplement the application as discussed at our recent meeting, you will also find attached the following three items:

1. Executive Summary of permit application and PSD Report, Sugar Cane Growers Cooperative, Boiler #8.

2. Proposed LAER for Sugar Cane Growers Cooperative, Boiler #8.

3. Proposed method of showing compliance of sulfur dioxide air quality standards.

As we have discussed, SCGC is greatly desirous of receiving final approval from the Department in early August, 1981 so that it can make necessary arrangements to construct a facility and bring it on line at the start of the 1982 - 1983 crop season.

We are highly appreciative of the continued cooperation and assistance that is being extended to SCGC by you and your staff and the representatives of the South Florida District and Palm Beach County Health Department. Please do not hesitate to call either me or David Buff of Environmental Science & Engineering if you have any questions with regard to the attached information.

Very truly yours,

Bill Green

William H. Green

WHG/gs
Enclosure

cc: Mirza Baig, South Florida District
Michael Martin, Palm Beach County Health Department
David Buff, Environmental Science & Engineering

RESPONSE TO
INFORMATION REQUEST
OF MAY 21, 1981

QUESTION 1

The oil consumption of each boiler is not measured on a routine basis. Only the total low sulfur fuel for Boilers 6 and 7 and the high sulfur fuel for Boilers 1 through 5 are measured as a total for each group. These consumptions are reported in the two accompanying attachments (see Attachment to Question 1).

QUESTION 2

No plant expansions that would increase air pollution emissions are planned in conjunction with the proposed boiler.

QUESTION 3

No, they are not. Only the sketches attached to Questions 23 are available at this time. Final design and application will be completed as soon as the Department makes a determination to approve this application.

QUESTION 4

Section II.F should be corrected to read 7 days per week operation. The source operates seasonally, generally November through March. The permit is based on a 184-day crop season to provide worst-case estimates and to cover all conceivable future operations. A corrected Page 2 of 10 is attached.

QUESTION 5

See attached performance sheet. Reported boiler efficiencies are ideal and are not realized in practice.

QUESTION 6

Although some removal of SO_2 from fuel oil combustion probably occurs, there have been no tests to document this; thus, no removal from fuel oil emissions was considered. The 40-percent figure for reduction from theoretical emissions from bagasse and residue combustion is based on stack tests carried out at three sites on four separate occasions; all these tests are documented in Attachment C. To our knowledge, no other SO_2-specific testing has been performed on bagasse- or residue-fired boilers.

Concerning the inlet/outlet test on SCGC Boiler 2, Attachment C states "The scrubber itself is seen to remove 27 percent of its inlet SO_2, which accounts for 11 percent out of the total 70-percent theoretical loss." In other words, 59-percent of the theoretical sulfur was lost before the scrubber inlet, and of that introduced to the scrubber, 27-percent was removed. It is nowhere implied that the impingement scrubber is capable of 40-percent SO_2 removal. Rather, the 40-percent figure reflects a conservative estimate of total system-wide removal (corresponding to the 70-percent in that particular test), the mechanism of which is not exactly known but is probably a combination of retention in bottom ash, and scrubber removal both in the gaseous state and in particulate form combined with fly ash.

QUESTION 7

The attached analyses from Riley Stoker (see Attachment to Question 7) and the analyses reported in Attachment C show that residue sulfur content ranges from 0.4 to 0.5 percent and bagasse sulfur content ranges from 0.1 to 0.2 percent. These results were obtained by analytical procedures measuring total sulfur. Some sulfur is present as sulfate which will not be converted to SO_2.

The range of theoretical SO_2 loss when burning bagasse and residue is 39 percent to 96 percent. Estimates of SO_2 emissions were calculated assuming a theoretical loss of 40 percent, which is the extreme low end of this range. The mass flow rate of SO_2 emissions was over-estimated for modeling purposes.

No matter what the actual sulfur content of bagasse and residue, or the actual removal percentage of the theoretical SO_2 in these fuels, at any one time, the proposed SO_2 emission limits of 0.54 $lb/10^6$ Btu for residue, 0.15 $lb/10^6$ Btu for bagasse, and 2.1 $lb/10^6$ Btu for oil will be met. Compliance with the proposed emissions limits will protect ambient air quality.

The attached fuel oil analyses indicate that the assumption of 8.1 lb/gallon and 17,500 Btu/lb result in greater SO_2 emissions per Btu heat input than would be obtained with the actual density and heat content (see Attachment to Question 7). Thus, the figures used in the report are again conservative estimates.

QUESTION 8

The corrected calculations are given in the attached revisions to Attachment A. In addition, Section III C of the permit should be revised to show actual NO_x emissions of 239.6 tons per year (TPY). A revised Page 3 of 10 is attached.

QUESTION 9

The fuel actually burned in Boiler 8 will be 1.8-percent sulfur, and the emissions from oil specifically from Boiler 8 will be 1.8 times those calculated in Attachment A:

MAXIMUM OIL CONSUMPTION

1,764 gal/hr x 157 (1.8) lb/10^3 gal =	498.5 lb SO_2/hr
13,879 lb/hr residue to provide remaining capacity =	66.6 lb SO_2/hr
Maximum SO_2 emissions =	565.1 lb SO_2/hr

POTENTIAL (UNCONTROLLED) EMISSIONS

1,764 gal fuel oil/hr =	498.5 lb SO_2/hr
13,879 lb/hr residue, no SO_2 loss considered =	110.0 lb SO_2/hr
	608.5 lb SO_2/hr
	2,220 TPY

ACTUAL EMISSIONS

Crop Season:

Residue =	387.9 TPY
Bagasse =	39.7 TPY
Fuel Oil (22.2 x 1.8) =	40.0 TPY

Off Season:

Residue =	335.4 TPY
Fuel Oil (14.5 x 1.8) =	26.1 TPY
Total =	829.1 TPY SO_2

In practice, sufficient oil of 1-percent sulfur content will be purchased to provide for the oil consumption of Boilers 6, 7, and 8, and 2.4-percent sulfur oil in Boilers 1 through 5. These fuels will be blended and burned in all boilers. While the specific SO_2 emission rate of Boiler 8 is reflected in preceding figures, the actual plant-wide increase in SO_2 emissions is correctly reflected under the actual emissions heading in Attachment A as is.

QUESTION 10

The working capacity of the fuel oil storage tank is 400,000 gallons. The design capacity of the existing fuel oil pump and heater is 60 GPM per set. There are two identical sets. One is used continuously while the other one is used as a spare. If required, both sets could operate at the same time with a total capacity of 120 GPM. This is the maximum amount of fuel oil that could be pumped to all boilers, including new Boiler 8.

QUESTION 11

The fuel mix used for SO_2 modeling is worse than the mix actually fired. During the crop season, the present boilers (1 through 7) consume 600 to 800 tons of residue per day and approximately 25,000 gallons of fuel oil per day. Table A-3 shows that Boilers 1 through 7 were modeled at 1,060 tons residue and 37,600 gallons of fuel oil per day to provide a substantial margin of safety.

Attachment A shows how boiler efficiency varies for each type of fuel burned according to the firing characteristics of that fuel. Accordingly, to produce a given amount of steam, the heat input from a low efficiency fuel must be greater than from a fuel which burns with a higher efficiency.

Heat input to the boiler is not directly controlled; rather, the feed rate of each fuel, which is directly related to heat input from that fuel, is varied as necessary according to availability and required steam production rates. The fuels, in order of preference, are: residue, bagasse, and fuel oil.

QUESTION 12

Bagasse is carried directly from the mills to the boilers by drag-type conveyors. It is fed into each boiler through variable speed rotary feeders, which are mechanical drums that deliver the bagasse to the furnaces.

Residue is carried from the furfural plant to temporary storage bins by belt conveyors. From there it is carried by screw conveyors and finally fed into each boiler through variable speed screw feeders.

Fuel oil is measured with volumetric flowmeters. The residue going to the boiler plant is weighed on belt scales. The bagasse itself is not measured. It is calculated by means of a heat balance, which takes into consideration the total steam generated and the steam generated by each different kind of fuel.

QUESTION 13

The SO_2 emissions tests at US Sugar Clewiston were conducted during the 1979 to 1980 crop season. The results are contained in Table C-1 of Attachment C under the "average" column.

QUESTION 14

As stated in Attachment D, the efficiency of particulate removed for an ESP or baghouse on bagasse/residue/oil-fired boilers is not known; no test data are available. It was assumed that the efficiency would be 91 percent or greater. So that cost effectiveness on an equal basis could be evaluated, operational costs at control efficiencies achievable by scrubbers were assumed. Since no economic superiority was shown at this level of control, analysis at higher efficiencies, where costs would be higher, was not carried out. Information about particle size distribution from the boiler is not available.

QUESTION 15

A fan full-operating curve is not available at this time. However the fan that we intend to purchase in the near future has the following characteristics:

	Fan Design
Pounds of flue gas per hour	619,200
Flue g-s temperature, °F	520
Flue gas volume, CFM	272,700
Total static i.w.g.	27.45
Fan R.P.M.	880
Horsepower input to fan shaft	1,738

Buffalo Forge Company, Size 2175, Type H-14; Arrgt. 3; double inlet, double width, independent pedestals, outlet damper, inlet damper, scroll liners, blade liners.

Fan driven by a steam turbine. Dual shaft extension for future motor.

QUESTION 16

No additives will be used in oil burned in the new boiler.

Boilers 6 and 7 are using BETZ 81-C fuel oil additive at the rate of 1 pint per 1,000 gallons of oil.

QUESTION 17

Furfural may be produced from a number of plant materials containing pentosans. In the case of bagasse, more than 90 percent of the pentosans are xylan. On acid hydrolysis, the xylan yields xylose, which subsequently loses three water molecules to form furfural. Other volatile organic materials are produced simultaneously.

The ash content increases for two reasons: (1) loss of organic material translates into an increase in percentage of ash, and (2) carbonate radicals are converted to the heavier sulfate radicals in the process.

The sulfur content increases because sulfuric acid is one of the acids used for the hydrolysis.

QUESTION 18

See attached Tables 18A and 18B.

QUESTION 19

The storage and transfer of excess bagasse is going to be achieved by the methods which are standard throughout the sugar industry.

Fugitive particulate matter emissions, if any, will be controlled by the same method used in our present operation (i.e., covering all belt conveyors, enclosing all transfer points, and periodically wetting the bagasse pile).

QUESTION 20

The only letter of performance of the scrubbers obtained from Joy Manufacturing Company is the attached letter dated February 8, 1974 (see Attachment to Question 20). Grain loadings to the scrubbers are of questionable value because of the variability of their magnitude.

Therefore, the guarantee was impossible to enforce. Since that letter was written, many improvements and modifications have been made in the design and operation of the Joy scrubbers installed in the Florida sugar industry. The performance obtainable by the scrubber under Florida conditions is reflected in the many compliance tests conducted during the past 6 years. We have never been able to obtain from Joy any other commitments on their part, except those contained in the above letter and in their literature on the subject which has been attached to the application. Scrubber performance in relation to particle size cannot be directly related to boiler heat input.

QUESTION 21

See sketch (Attachment to Question 21).

QUESTION 22

See sketch (Attachment to Question 22).

QUESTION 23

See sketch (Attachment to Question 23).

QUESTION 24

The efficiency curves for the mechanical dust collection are attached (see Attachment to Question 24). These correspond to inlet loadings from 2 to 5 grains per cubic foot. The outlet loading will be affected by change in particle size. However, the final emission from the scrubbers seem to be independent of the installation of a mechanical dust collector, as shown by the boilers at the SCGC mill, which have been permitted with and without mechanical collectors.

As stated before, this unit is being installed for the sole purpose of protecting the induced draft fan, not as a particulate control device.

The approximate total cost of this dust collector will be $80,000.

QUESTION 25

See sketch (Attachment to Question 25).

QUESTION 26

The flow rates in Table 2-4 are based on calculations in Appendices A and B of the PSD report. The calculations in Appendices A and B are based on plant records and manufacturer's performance data. It is not known on what basis the flow rates given in the original permits were determined.

QUESTION 27

PARTICULATE SOURCES

The sugar industry sources of particulate matter which were omitted in the TSP modeling are package oil-fired units whose particulate emissions are negligible compared to the emissions from nonfossil fuel combustion. All sources in the direction of maximum impact are accounted for. Under meteorological conditions aligning the surrounding sources with SCGC, none of these facilities contributed more than 2 ug/m^3 to the TSP concentration in the area of impact of the proposed SCGC boiler; this contribution is included in all reported impact values. Including the package unit emissions would not alter the results of the interaction analysis.

Both Pratt & Whitney and FPL Martin are greater than 35 km from the SCGC mill. Pratt & Whitney's emission rate was considered too low to have a significant effect at this range, and previous modeling experience indicates that the effect of FPL Martin's particulate emissions at this range and in the interacting direction would be less than 2 ug/m^3 (24-hour).

Moore Haven Sugar Mill is no longer operating.

SULFUR DIOXIDE SOURCES

Talisman Sugar Boiler 4 was not omitted (see Page 60 of Appendix C, Source No. 138). SO_2 emissions from GCI and City of Pahokee sources were omitted because their low emission rate and high stack exit temperature preclude any significant ground level impacts.

Both Pratt & Whitney and FPL Martin are greater than 35 km from the SCGC mill. Pratt & Whitney's emission rate was considered too low to have a significant effect at this range, and previous modeling experience indicates that the effect of FPL Martin's SO_2 emissions at this range and in the interacting direction would be less than 10 ug/m^3 (24-hour).

The sugar industry sources were omitted from SO_2 interaction modeling because theoretical emissions of SO_2 from bagasse combustion are generally less than the permitted allowable emissions of particulate matter, and the maximum interactive TSP contribution found was less than 2 ug/m^3. The inventory published in the 1980 Palm Beach County Annual Report shows that even when oil consumption is considered, and theoretical SO_2 emissions are assumed, that SO_2 emission from the mills would not contribute more than 4 ug/m^3 of SO_2 on a 24-hour basis in the area of impact of SCGC. Stack tests discussed previously indicate that actual SO_2 emissions from these sources are significantly less than reported in the Palm Beach County inventory.

SO_2 emissions from the Florida Refinery Kiln (Pt. 03) were not listed in APIS 1981; the emission rate input to the refined grid model run for the other points at this facility is actually greater than that given for the total source in the 1981 Palm Beach County Annual report.

QUESTION 28

No Question 28 found.

QUESTION 29

The stack diameter for the modified Boilers 6 and 7 configuration is 7.0 feet (2.13 meters). The computer modeling is not affected, as the modeled exit velocity results in the same volumetric flow rate and plume rise.

The position of Everglades Refinery relative to SCGC should be 0 meters north and 19,000 meters east. The results of the refined modeling will not be affected, since critical meteorology causes greatest impacts in a direction not influenced by this facility during that 24-hour or 3-hour period.

QUESTION 30

A response to this question is being prepared, however, we understand through conversation with Larry George and Cleve Holladay that although this is a subject for further discussion it is not necessary for the application to be deemed complete.

ATTACHMENT TO QUESTION 1

SUGAR CANE GROWERS COOPERATIVE OF FLORIDA

#1

Monthly Fuel Oil Consumption for Year 1980

Month	Boilers #6 & 7 Low Sulfur Fuel Oil (Gals.)	Boilers #1, 2, 3, 4 & 5 Fuel Oil (Gals.)
Jan. 1 - 27'80	348,770	357,502
1/28 - Feb. 24'80	288,560	301,333
2/25 - Mar. 30'80	455,120	401,405
3/31 - Apr. 3'80	26,340	76,222
Nov. 1 - 30'80	292,740	110,433
Dec. 1 - 31'80	332,700	101,801
TOTAL	1,744,230	1,348,696
Apr. 4 through Jun. 21'80 *	--0--	318,140
GRAND TOTAL	1,744,230	1,666,836

* Off-season operation by the furfural plant.

AOV:mg
5/26/81

ATTACHMENT TO QUESTION 1

SUGAR CANE GROWERS COOPERATIVE OF FLORIDA

#1

Monthly Fuel Oil Consumption for Year 1979

Month	Boilers #6 & 7 Low Sulfur Fuel Oil (Gals.)	Boilers #1, 2, 3, 4 & 5 Fuel Oil (Gals.)
Jan. 1 - 28'79	389,595	78,170
1/29 - Feb. 25'79	414,165	100,594
2/26 - Mar. 25'79	365,180	142,762
3/26 - Apr. 3'79	77,260	59,704
Nov. 1 - 25'79	289,850	140,398
11/26 - Dec. 31'79	428,581	136,065
TOTAL	1,964,631	657,693

AOV:mg
5/26/81

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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.

Addition of 240,000-lb/hr rated steam capacity boiler capable of burning bagasse, bagasse residue, and oil. Modification of existing plant along with new source will result in net air quality improvement and full compliance (see Project description Section 1.0 of PSD report).

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction July 1981 Completion of Construction November 1982

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.)

Scrubber system for new boiler (including ducts, fans, ports, etc.): $1.1 to 1.6 millio

Boiler No.4 stack modification: $200,000.

Boilers No.6 and No.7 stack modification: $175,000.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

NA - New emission point

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes __x__ No

F. Normal equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 39 ; if power plant, hrs/yr ____ ;

if seasonal, describe: Source operates during crop season, generally November through March. May also operate on occasion during off season (October, April, May, and June).

G. 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? Yes, ozone
   a. If yes, has "offset" been applied? NA
   b. If yes, has "Lowest Achievable Emission Rate" been applied? NA
   c. If yes, list non-attainment pollutants.
      Ozone
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) requirements 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

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

BELLE GLADE, FLORIDA **BEST AVAILABLE COPY**

ATTACHMENT TO QUESTION 5

Predicted performance data - One steam generating unit, 240,000 lbs. of steam per hour maximu continuous capacity; 400 psig operating pressure; 240 F feedwater; steam temperature 550 F.

Fuel - Bagasse: Moist. 54.00; Ash 0.69; 3,856 Btu per pound; C 21.27; O 21.10; H 2.94
#6 Oil: C 87.00; H 10.50; S 1.50; N 0.30; O 0.60; Ash 0.10; 18,500 Btu per pound
Furfural Residue (Future): C 31.80; H 3.12; S 0.36; O 22.98; Ash 1.74; Moist. 40.00; 5,394 Btu per pound

	Oil	Bagasse	Residue (Future)	
				2 Hours
1. Pounds of steam per hour actual evap.	240,000	240,000	240,000	264,000
2. K Btu in steam above F.W. temp.	253,135	256,195	254,683	280,484
3. Temp. of gases leaving furnace, F	1,775	1,760	1,730	1,775
4. % excess air in boiler exit gases	15	40	40	40
5. Temp. of boiler exit gases, F	650	725	690	715
6. Temp. of economizer exit gases	570	650	615	635
7. Temp. of air heater exit gases, F	340	450	410	425
8. Temp. of air ent. heater (room temp.) F	80	80	80	80
9. Temp. of air leaving heater, F	346	463	428	437
10. Total steam temp. leaving superheater, F	530	550	540	542
11. Steam pressure drop thru superheater, psi	19	19	19	23
12. Boiler drum pressure, psig	419	419	419	423
13. Furnace draft	.25	.25	.25	.25
14. Draft loss thru blr., superheater, and econ.	.91	2.85	2.00	2.45
15. Draft loss thru air heater	.57	1.80	1.26	1.55
16. Draft loss thru scrubber & D.C.	3.15	9.92	6.95	8.53
17. Draft loss thru ducts & dampers	.45	1.43	1.00	1.23
18. Total static suction at fan (i.w.g.)	5.33	16.25	11.46	14.01
19. Air pressure drop thru air heater	1.05	2.30	1.87	2.29
Air pressure drop thru ducts & dampers (including air measurement)	1.86	2.00	1.63	1.99
21. Air pressure drop thru firing equipment	4.10	3.10	2.52	3.08
22. Total static pressure at fan (i.w.g.)	7.01	7.40	6.02	7.36
23. Pounds of fuel per hour	15,688	111,740	66,529	73,946
24. Pounds of air per hour	248,500	368,500	332,000	367,500
25. Pounds of gas per hour leaving unit	264,000	469,000	392,500	435,000
26. Overall efficiency complete unit	87.22	59.46	70.97	70.32
27. Heat release in furnace Btu/cu.ft./hr.	13,750	19,840	16,680	18,500
28. Heat release in furnace Btu/sq.ft./hr.	68,450	80,100	74,700	83,100
29. K Btu per sq.ft. grate surface per hour	---	775	652	723
HEAT BALANCE %				
30. Dry flue gas loss at exit	5.33	8.66	8.16	8.54
31. Loss due to hydrogen and fuel moisture	5.92	25.25	15.11	15.20
32. Loss due to moisture in air	.18	.28	.26	.27
33. Loss due to radiation	.35	.35	.35	.32
34. Loss due to unburned combustibles	--	4.50	3.65	3.85
35. Manufacturer's margin	1.00	1.50	1.50	1.50
36. Total losses	12.78	40.54	29.03	29.68
37. Efficiencies of complete unit	87.22	59.46	70.97	70.32

The unit consists of RX-35 boiler, H.S. 23,500 sq.ft.; projected waterwalls, H.S. 3585 sq.ft.; air heater, H.S. 29,400 sq.ft.; superheater for 550 F; traveling grate spreader stoker 24 x 24, 540 sq.ft.; 3 #4 Riley burners; furnace volume 21,100 cu.ft.; furnace area 4200 sq.ft. Drawing LP-2377

RILEY STOKER CORPORATION
WORCESTER, MASSACHUSETTS
1/23/81 W.J.W.
2/25/81 REVISED W.J.W.
3/2/81 REVISED W.J.W.
4/2/81 REVISED W.J.W.
4 [illegible]

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ATTACHMENT TO QUESTION 5

SUGAR CANE GROWERS COOPERATIVE OF FLORIDA
BELLE GLADE, FLORIDA

		Bagasse (2 hours)
1.	Pounds of steam per hour actual evap.	264,000
2.	K Btu in steam above F.W. temp.	282,150
3.	Temp. of gases leaving furnace, F.	1,805
4.	% excess air in boiler exit gases	40
5.	Temp. of boiler exit gases, F	750
6.	Temp. of economizer exit gases	670
7.	Temp. of air heater exit gases, F.	465
8.	Temp. of air ent. heater (room temp.) F.	80
9.	Temp. of air leaving heater, F.	473
10.	Total steam temp. leaving superheater, F	553
11.	Steam pressure drop thru superheater, psi	23
12.	Boiler drum pressure, psig	423
13.	Furnace draft	25
14.	Draft loss thru blr., superheater, and econ.	3.49
15.	Draft loss thru air heater	2.21
16.	Draft loss thru scrubber & D.C.	12.18
17.	Draft loss thru ducts & dampers	1.76
18.	Total static suction at fan (i.w.g.)	19.89
19.	Air pressure drop thru air heater	2.82
20.	Air pressure drop thru ducts & dampers (including air measurement)	2.44
21.	Air pressure drop thru firing equipment	3.79
22.	Total static pressure at fan (i.w.g.)	9.05
23.	Pounds of fuel per hour	124,696
24.	Pounds of air per hour	408,000
25.	Pounds of gas per hour leaving unit	516,000
26.	Overall efficiency complete unit	58.68
27.	Heat release in furnace Btu/cu.ft./hr.	22,140
28.	Heat release in furnace Btu/sq.ft./hr.	89,400
29.	K Btu per sq. ft. grate surface per hour	865

HEAT BALANCE %

30.	Dry flue gas loss at exit	9.06
31.	Loss due to hydrogen and fuel moisture	25.40
32.	Loss due to moisture in air	.29
33.	Loss due to radiation	.32
34.	Loss due to unburned combustibles	4.75
35.	Manufacturer's margin	1.50
36.	Total losses	41.32
37.	Efficiencies of complete unit	58.68

RILEY STOKER CORPORATION
WORCESTER, MASSACHUSETTS

4-13-81 W.J.W.

ATTACHMENT TO QUESTION 7

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613
A SUBSIDIARY OF THE RILEY COMPANY

FUELS LABORATORY

TEST REPORT

Laboratory No. 22,425 Sample of Bagasse Date Rec'd 3/1/79

Received From Sugar Cane Growers Belle Glade, Fla

Sample Data Bagasse 9 8-500124

Contract No. (641-91110) P.O. # 44837M Field Sample By Customer

Air Drying Loss	0.0 %				
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	3.7%	-----	Moisture	%	-------
Volatile	83.4%	86.6 %	Carbon	%	48.5 %
Ash	0.8%	0.8 %	Hydrogen	%	6.1 %
Fixed Carbon	12.1%	12.6 %	Nitrogen *	%	0.29 %
	100.0 %	100.0 %	Oxygen (diff.)	%	44.21 %
British Thermal Units	7,617	7,910	Sulfur	%	0.1 %
Fusibility of Ash			Ash	%	0.8 %
Initial Deformation	F			100.0 %	100.0 %
Softening	F		Free Swelling Index		
Fluid	F		Grindability Index		

(* Skinner & Sherman)

Date April 27, 1979 Thomas J. Gallagher

PM40-11777

ATTACHMENT TO QUESTION 7

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613
A SUBSIDIARY OF THE RILEY COMPANY

FUELS LABORATORY

TEST REPORT

Laboratory No. 22,418 Sample of Bagasse Date Rec'd 3/1/79

Received From Sugar Cane Growers Belle Glade, Fla

Sample Data Bagasse 2 8 - 580170

Contract No. (641-91110) P.O. #44837M Field Sample By Customer

Air Drying Loss	1.0 %				
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	4.6 %	------	Moisture	%	--------
Volatile	81.3 %	84.3 %	Carbon	%	47.3 %
Ash	2.2 %	2.3 %	Hydrogen	%	6.0 %
Fixed Carbon	12.9 %	13.4 %	Nitrogen *	%	0.36 %
	100.0 %	100.0 %	Oxygen (diff.)	%	43.84 %
British Thermal Units	7,698	7,985	Sulfur	%	0.2 %
Fusibility of Ash			Ash	%	2.3 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

(* Skinner & Sherman)

Date April 27, 1979 Thomas J. Gallagher

PM40–11777

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613
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ATTACHMENT TO QUESTION 7

FUELS LABORATORY

TEST REPORT

Laboratory No. 22,059 Sample of Furfural Date Rec'd 1/23/79

Received From Sugar Cane Growers Belle Glade, Fla

Sample Data Furfural Bagasse Residue Sample Blr.#4 Test 2

Contract No. P.O.#44837M (641-91110) Field Sample By Customer

Air Drying Loss	33.5 %				
Proximate Analysis	As Rec'd	Dry	Ultimate Analysis	As Rec'd	Dry
Moisture	37.3 %	------	Moisture	%	--------
Volatile	48.5 %	77.3 %	Carbon	%	52.8 %
Ash	1.4 %	2.2 %	Hydrogen	%	5.7 %
Fixed Carbon	12.8 %	20.5 %	Nitrogen *	%	0.49 %
	100.0 %	100.0 %	Oxygen (diff.)	%	38.41 %
British Thermal Units	5,605	8,940	Sulfur	%	0.4 %
Fusibility of Ash			Ash	%	2.2 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

(* Skinner & Sherman)

Date February 8, 1979

Thomas J. Gallagher

PM40-11777

ATTACHMENT TO QUESTION 7

RILEY | RILEY STOKER CORPORATION

POST OFFICE BOX 547, WORCESTER, MASS. 01613
A SUBSIDIARY OF THE RILEY COMPANY

FUELS LABORATORY

TEST REPORT

Laboratory No. 22,394 Sample of Furfural Date Rec'd 2/28/79

Received From Sugar Cane Growers Belle Glade, Florida

Sample Data Furfural Bagasse Residue Sample Boiler 3 Test #6

Contract No. (641-91110) P.O. 44837M Field Sample By Customer

Air Drying Loss		29.7 %			
Proximate Analysis	**As Rec'd**	**Dry**	**Ultimate Analysis**	**As Rec'd**	**Dry**
Moisture	36.9 %	------	Moisture	%	--------
Volatile	47.6 %	75.4 %	Carbon	%	53.6 %
Ash	2.0 %	3.2 %	Hydrogen	%	5.5 %
Fixed Carbon	13.5 %	21.4 %	Nitrogen *	%	0.37 %
	100.0 %	100.0 %	Oxygen (d9ff.)	%	36.83 %
British Thermal Units	5,726	9,075	Sulfur	%	0.5 %
Fusibility of Ash			Ash	%	3.2 %
Initial Deformation		F		100.0 %	100.0 %
Softening		F	Free Swelling Index		
Fluid		F	Grindability Index		

(*Skinner & Sherman)

Date April 23, 1979 Thomas J. Gallagher

PM40-11777

A SUBSIDIARY OF THE RILEY COMPANY

ATTACHMENT TO QUESTION 7

ANALYSIS BUNKER C FUEL

DISCHARGED AT RIVIERA TANK "B"
JULY 24, 1978

Gravity, A. P. I. @ 60'F	13.4
Ash, Water Soluble,Wt.%	0.05
Ash, Total Wt. %	0.084
Flash, p.m.'F	152
Heat of Combustion/BTU/LB	18400
BS&W.Vol.%	0.1
Viscosity	
SSU @ 100'F	3952
SSF @ 122'F	187
Sulfur,Wt.%	2.30
Pour Point,'F	35
Sediment by Hot Filtration,'F	0.08
Water by Distillation, Vol. %	0.35

W. C. Stickel

cc: J. F. Roehl, Jr.
J. A. Belcher, Jr.
G. G. Williams
E. J. Travers
J. E. Cashon
Carl Bloomberg
Ed Troost
Phil Chapman
Harry Bruneau
Jim Hiers
Clete Jones
Frank Stopinski

ATTACHMENT TO QUESTION 7

Analysis of Beloil (1% Residual Fuel Oil) in Inventory being delivered to your facility at this time.

Gravity, A.P.I. @ 60°F	21.5
Ash, Total, Wt., %	0.06
Ash, Water Soluble	0.04
Concarbon Residue, Wt., %	5.8
Flow Point	50
Flash Point, P.M.C.C., °F	200
Heat Combustion, BTU/USG	144,596
Sediment by Hot Filtration, Wt., %	0.04
Sulfur Content, Wt., %	0.95
Vanadium, PPM	190
Viscosity, SSU @ 100°F, Sec.	484
Viscosity, SSU @ 122°F, Sec.	268
Water and Sediment, (BS&W), Vol., %	0.05

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Not applicable				

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): Not Applicable
2. Product Weight (lbs/hr): 240,000-lb steam/hr rated capacity
   264,000-lb steam/hr peak capacity

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Particulate	100.8	324.5	0.2 lb/MM Btu, 17-2.05 (6)	100.8	1,121.4	4,091	A
Sulfur Dioxide	565.1	829.1	NA	NA	608.5	2,220	A
Nitrogen Oxides	129.2	239.6	NA	NA	129.2	471.4	A
Hydrocarbons	140	348	NA	NA	140	440	A
Carbon Monoxide	140	349	NA	NA	140	440	A

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
Joy Turbulaire Type D	Particulate	+90%	See Attachment B	manufacturer's literature
Impingement Scrubber, or				
equivalent	SO_2	40%	NA	Test data
				see Attachment C

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. — 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)

[5]If Applicable

Table 18A. Crop Season Emissions from Existing Boilers

Boiler	Capacity lb steam/hr	Ton/Day Bagasse (10^6 Btu)	Ton/Day Residue (10^6 Btu)	Gallons/Day Oil (10^6 Btu)	Total Btu (10^6 Btu/hr)	Crop Season Emissions (tons)† PM	SO_2	NO_x	CO	HC
1 and 2	240,000	165.6 (2,650)	398.4 (7,092)	1,392 (195)	414	226	424	128	209	201
3	100,000	278.4 (4,454)	—	576 (81)	189	103	77	72	117	114
4	240,000	165.6 (2,650)	398.4 (7,092)	1,392 (195)	414	181	424	128	209	201
5	160,000	110.4 (1,766)	266.4 (4,742)	936 (131)	277	151	283	86	139	134
6 and 7	150,000	—	—	33,312 (4,664)	194	43	896	184	15	3
TOTAL						704	2,104	598	689	653

* Based on Table A-3.

† PM: Boilers 1, 2, 3, and 5 at 0.25 lb/10^6 Btu, Boiler 4 at 0.2 lb/10^6 Btu, all oil at 0.1 lb/10^6 Btu
SO_2: Based on Table A-3
NO_x: 1.2 lb/ton wet bagasse, 2.67 lb/ton dry bagasse, 2.18 lb/ton dry residue, 60 lb/10^3 gal fuel oil
CO: 5 lb/10^3 gallons fuel oil; 2 lb/ton wet bagasse; 4.44 lb/ton dry bagasse; 3.64 lb/ton dry residue.
HC: 2 lb/ton wet bagasse, 4.44 lb/ton dry bagasse, 3.64 lb/ton dry residue, 1 lb/10^3 gal fuel oil.
184-day crop season.

Source: ESE, 1981.

Table 18B. Off-Season Emissions from Existing Boilers

Boiler	Capacity lb steam/hr	Ton/Day Residue (10^6 Btu)	Gallons/Day Oil (10^6 Btu)	Total Btu (10^6 Btu/hr)	Off-Season Emissions (tons)*				
					PM	SO_2	NO_x	CO	HC
Combination of Boilers 1, 2, 4, or 5 to produce:	400,000	882 (15,700)	2,328 (326)	6,681	236	548	124	193	193
CROP SEASON TOTAL					704	2,104	598	689	653
ANNUAL EMISSIONS					940	2,652	722	882	846

* Emission rates on same basis as Table 18A; particulate assumed worst-case 0.25 lb/10^6Btu; 120-day maximum off-season operation.

Source: ESE, 1981.

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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

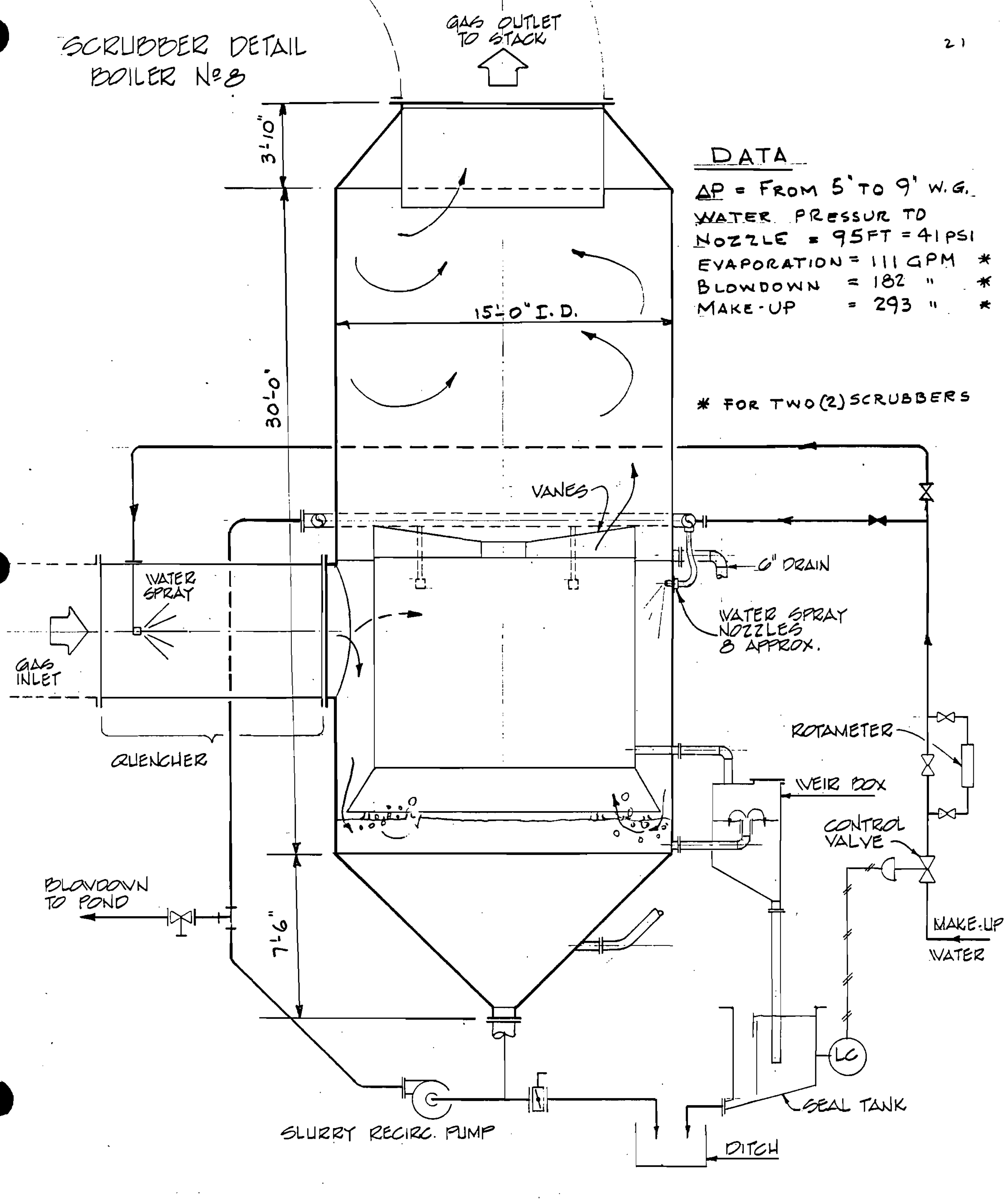
ATTACHMENT TO QUESTION 21

SHEET Nº 1 OF 1

GLADES SUGAR HOUSE
BELLE GLADE FLORIDA
MAY 26, 1981

21

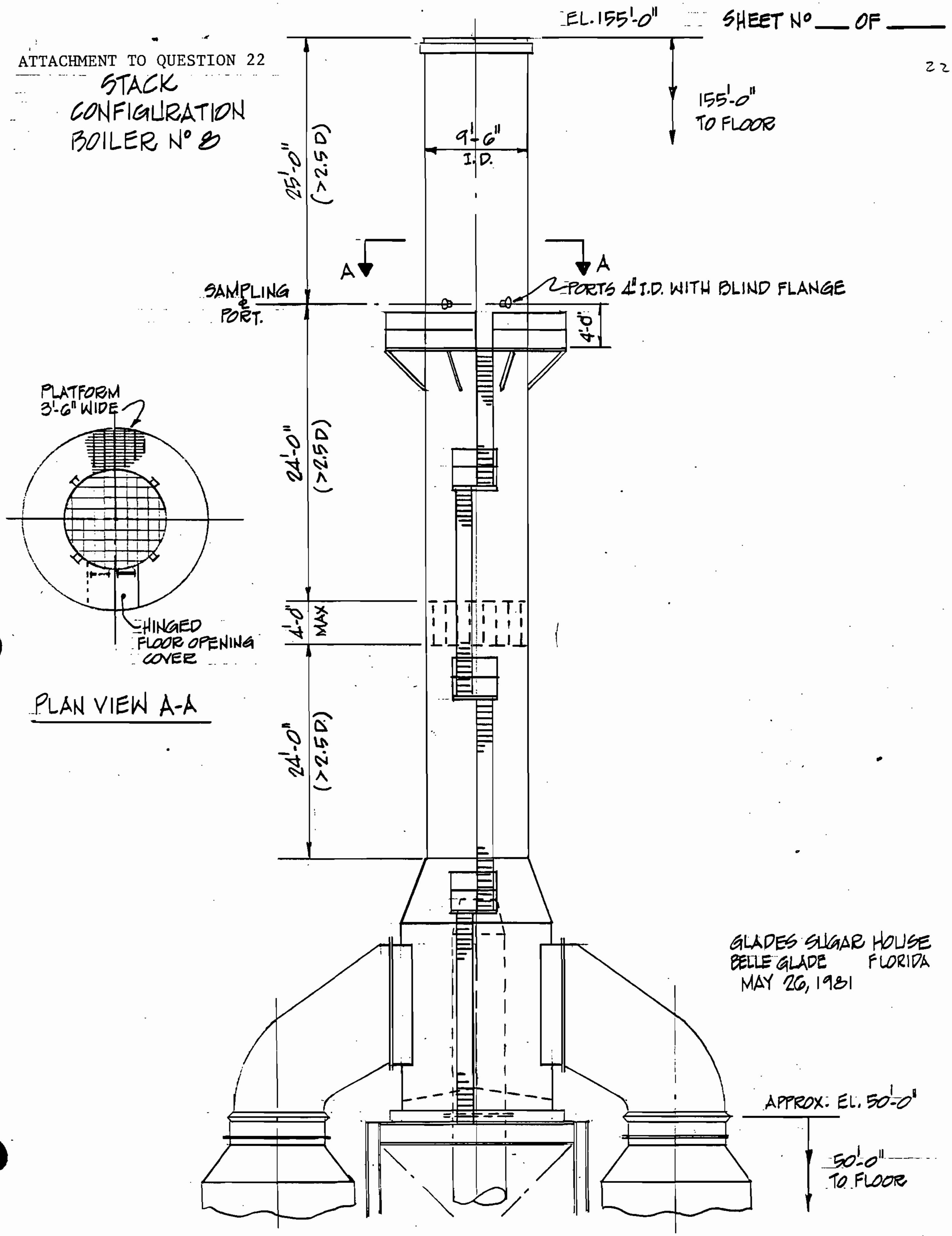
SCRUBBER DETAIL BOILER Nº 8



ATTACHMENT TO QUESTION 22

22

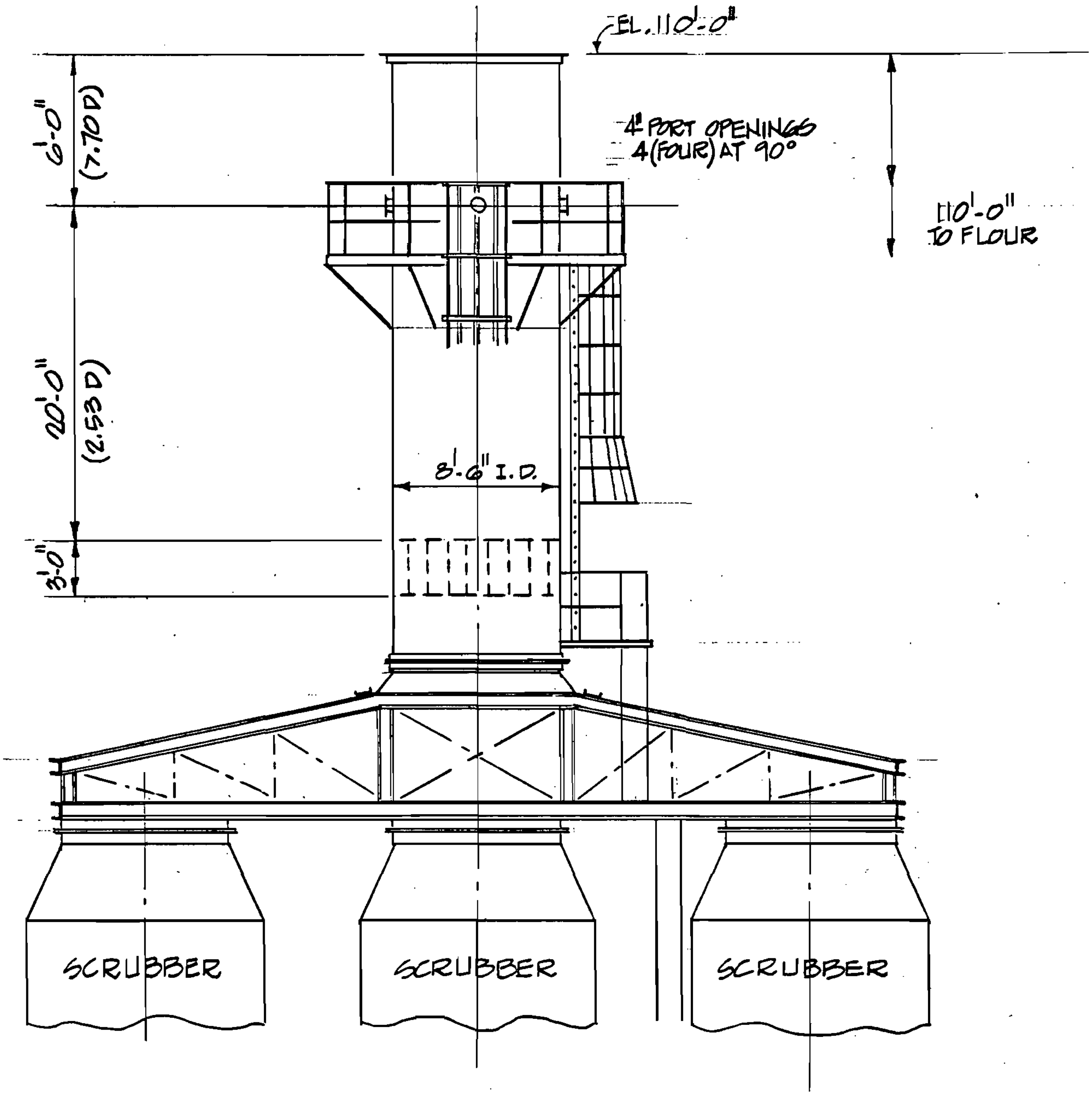
STACK CONFIGURATION BOILER N° 8



GLADES SUGAR HOUSE
BELLE GLADE FLORIDA
MAY 26, 1981

ATTACHMENT TO QUESTION 23

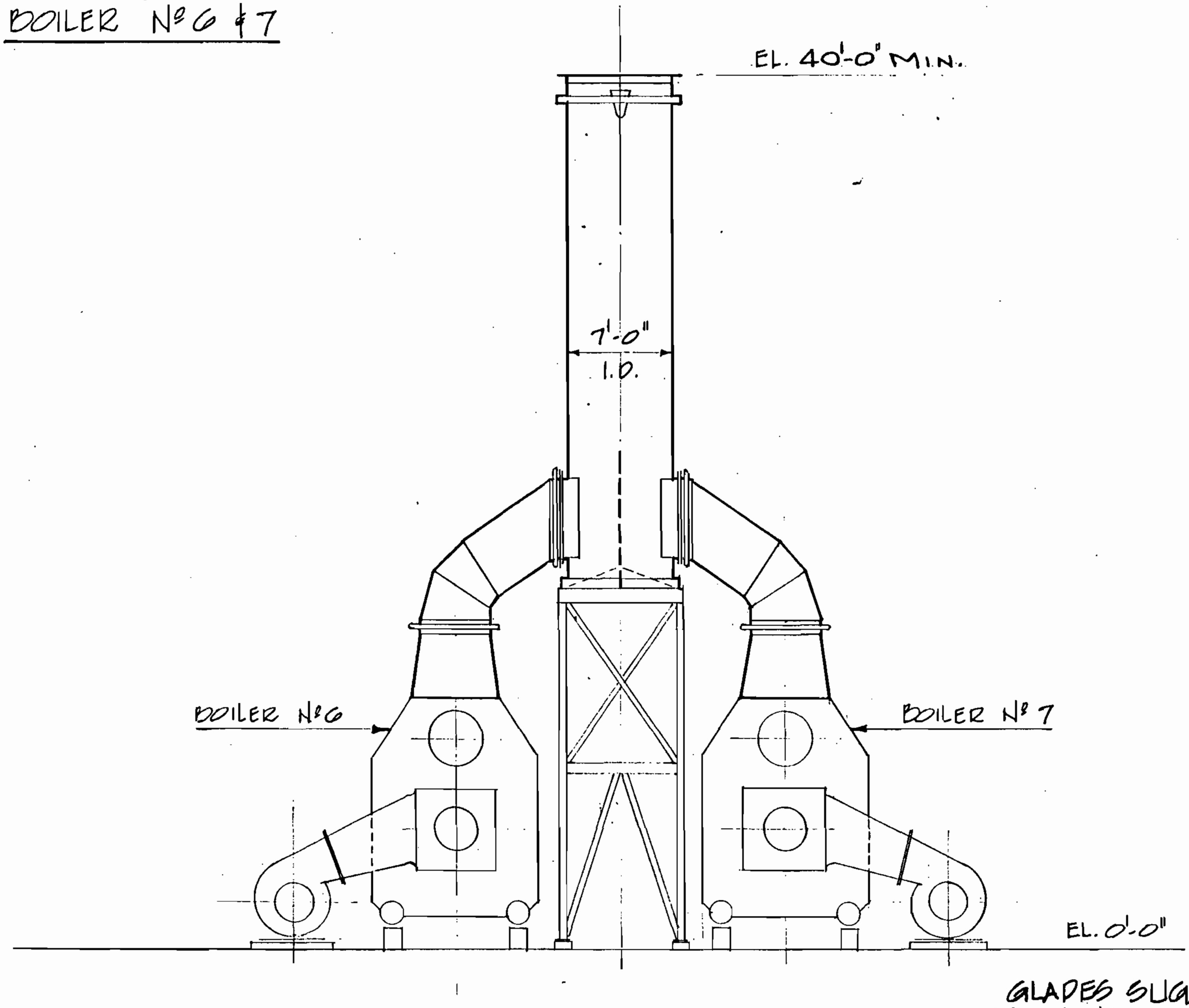
STACK CONFIGURATION BOILER N°4



GLADES SUGAR HOUSE
BELLE GLADE FLORIDA
MAY 26, 1981

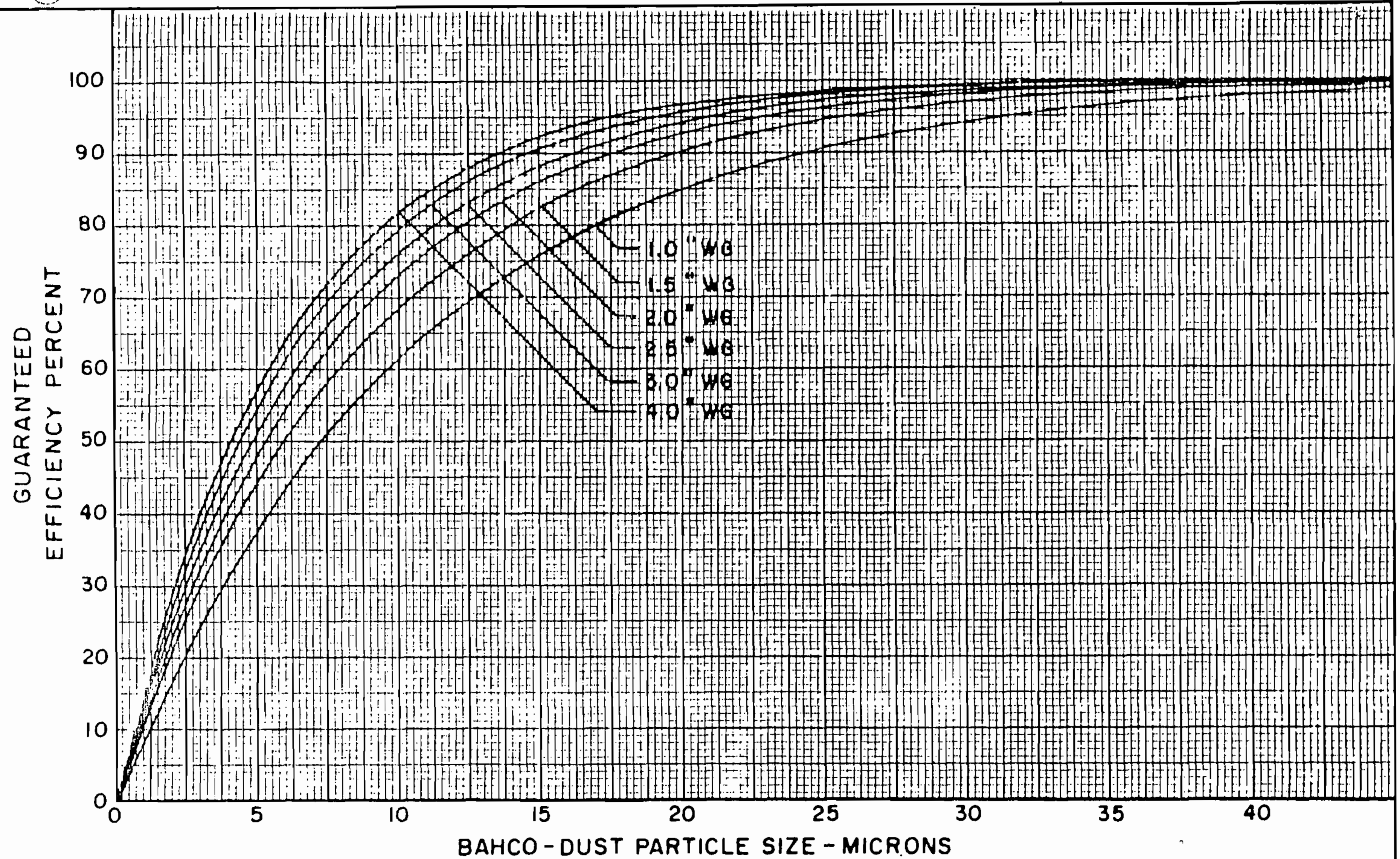
ATTACHMENT TO QUESTION 23

STACK CONFIGURATION.
BOILER Nº 6 & 7



GLADES SUGAR HOUSE
BELLE GLADE FLORIDA
MAY 26, 1981

SHEET NO 2 OF 2



ATTACHMENT TO QUESTION 24

CONDITIONS OF CURVE

DUST SPECIFIC GRAVITY - 2.5
DUST CONCENTRATION - 2 TO 5 GR./CU. FT.
GAS TEMPERATURE - 70 - 800 °F

Air Correction Division
Universal Oil Products Company
Tokeneke Road · Darien, Connecticut 06820 203·655·8711
uop

MICRON EFFICIENCY CURVES
TUBULAR DUST COLLECTOR
DESIGN 104B OR 105A

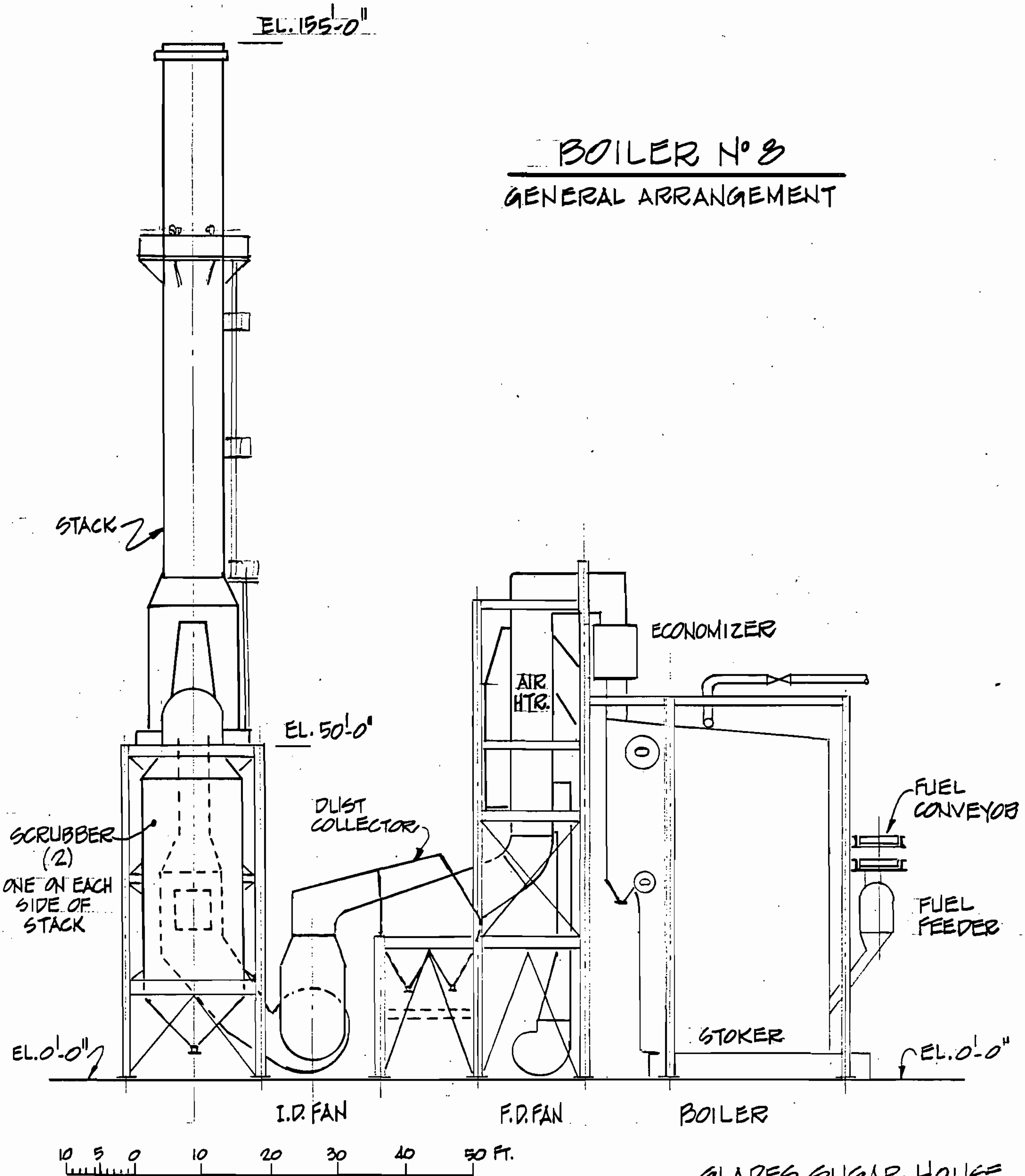
COMPUTED BY	DATE	APPROVED BY	DATE	APPROVED BY	DATE
A.C.	1-9-67	TECH. EP	1-9-67	MKTG. JF	1-10-67

FORM NO. 5-007-2-R00

ATTACHMENT TO QUESTION 25

25

BOILER No 8
GENERAL ARRANGEMENT



GLADES SUGAR HOUSE
BELLE GLADE FLORIDA
MAY 26, 1981

ATTACHMENT A

PROPOSED BOILER NO. 8
EMISSION ESTIMATES

FUEL USAGE CALCULATIONS

Peak Steam Capacity = 264,000 lb/hr
Btu requirements per lb steam = 1,050 Btu/lb
Boiler efficiencies: Bagasse - 55%
Residue - 62.5%
Oil - 80%
System SO_2 loss: Bagasse - 40%
Residue - 40%
Oil - 0%

Fuel Analysis:

	Bagasse	Residue	No. 6 Fuel Oil
Btu/lb	8,000 (dry)	8,900 (dry)	17,500
lbs/gal	--	--	8.1
% S	0.1 (dry)	0.4 (dry)	1.0
% N	0.3 (dry)	0.4 (dry)	0
% Ash	0.5-0.3 (dry)	1.9-3.8 (dry)	0.1
% H_2O	55	40	0.2

Bagasse Burning: 264,000 lb/hr steam x 1,050 Btu/lb ÷ 0.55 = 504.0 x 10^6 Btu/hr
504.0 x 10^6 Btu/hr ÷ 8,000 Btu/lb = 63,000 lb/hr dry bagasse

Residue Burning: 264,000 lb/hr steam x 1,050 Btu/lb ÷ 0.625 = 443.5 x 10^6 Btu/hr
443.5 x 10^6 Btu/hr ÷ 8,900 Btu/lb = 49,834 lb/hr dry residue

Oil Burning: Limited to 250 x 10^6 Btu/hr heat input
250 x 10^6 Btu/hr ÷ 17,500 Btu/lb = 14,286 lb/hr = 1,764 gal/hr

EMISSION CALCULATIONS

BURNING 100-PERCENT RESIDUE

1. Particulate
   Allowable and maximum emissions = 443.5 x 10^6 Btu/hr x 0.2 lb particulate/10^6 Btu = 88.7 lb/hr

   Potential (uncontrolled) emissions: assume same as bagasse in AP-42 on a "dry" basis. Factor is 16 lb/ton bagasse on a wet basis.

   Convert to dry basis: 16 lbs/ton wet bagasse x 1 ton wet/0.55 ton dry = 29.1 lb/ton dry x 49,834 lb/hr residue (dry) ÷ 2,000 = 724.9 lb/hr.

2. Sulfur Dioxide (based on scrubber removal of 40%)
   Maximum emissions = 49,834 lb/hr residue (dry) x 0.004 x 2 x 0.6 = 239.2 lb/hr

   Potential (uncontrolled) emissions = 239.2 lb/hr ÷ 0.6 = 398.7 lb/hr

3. Nitrogen Oxides
   Maximum and Potential (uncontrolled) emissions: assume same factor as bagasse. Factor 1.2 lb/ton bagasse on a wet basis.
   Convert to dry basis: 1.2 lb/ton wet bagasse x 1 ton wet/0.55 ton dry = 2.18 lb/ton x 49,834 lb/hr residue (dry) ÷ 2,000 = 54.4 lb/hr

4. Carbon Monoxide and Hydrocarbons
   AP-42: 2 lb/ton wet bagasse x 1/0.55 = 3.64 lb/ton dry residue
   3.64 x 49,834 ÷ 2,000 = 90.7 lb/hr

BURNING FUEL OIL AT 250x10^6 Btu/hr

1. Particulate
   Allowable and maximum emissions = 250 x 10^6 Btu/hr x 0.1 lb particulate/10^6 Btu = 25.0 lb/hr

   Potential (uncontrolled) emissions: from AP-42 Table 1.3-1
   lb/10^3 gal = 10(S) + 3 = 10(1) + 3 = 13
   1,764 gal/hr x 13 lb/10^3 gal = 22.9 lb/hr

2. Sulfur Dioxide
   Maximum and Potential Emissions: from AP-42 Table 1.3-1
   lb/10^3 gal = 157 (S) = 157(1) = 157
   1,764 gal/hr x 157 lb/10^3 gal = 276.9 lb/hr

3. Nitrogen Oxides
   Maximum and Potential Emissions: from AP-42 Table 1.3-1
   60 lb/10^3 gal x 1,764 gal/hr = 105.8 lb/hr

4. Hydrocarbons
Maximum and potential (uncontrolled) emissions: from AP-42, Table 1.3-1
$1\ lb/10^3$ gal x 1,764 gal/hr = 1.8 lb/hr

5. Carbon Monoxide
Maximum and potential (uncontrolled) emissions: from AP-42, Table 1.3-1
$5\ lb/10^3$ x 1,764 gal/hr = 8.8 lb/hr

BURNING 100-PERCENT BAGASSE

1. Particulate
   Allowable and maximum emissions = 504.0 x 10^6 Btu/hr x 0.2 lb particulate/10^6 Btu = 100.8 lb/hr

   Potential (uncontrolled) emissions: from AP-42, Table 1.8-1
   16 lb/ton bagasse (wet) x 63,000 lb/hr bagasse (dry) ÷ 0.45 ÷ 2,000 = 1,120 lb/hr

2. Sulfur Dioxide (based on scrubber removal of 40%)
   Maximum Emissions = 63,000 lb/hr bagasse (dry) x 0.001 x 2 x 0.6 = 75.6 lb/hr

   Potential (uncontrolled) emissions = 75.6 lb/hr ÷ 0.6 = 126.0 lb/hr

3. Nitrogen Oxides
   Maximum and potential (uncontrolled) emissions: from AP-42, Table 1.8-1
   1.2 lb/ton bagasse (wet) x 63,000 ÷ 0.45 lb/hr bagasse ÷ 2,000 = 84.0 lb/hr*

4. Carbon Monoxide and Hydrocarbons
   AP-42: 2 lb/ton wet bagasse x 1/0.45 = 4.44 lb/ton dry bagasse
   4.44 x 63,000 ÷ 2,000 = 140 lb/hr

* This figure could be greatly overestimated since a recent EPA study reported NO_x levels of 0.002 lb/10^6 Btu, equivalent to 1.0 lb/hr for this boiler ("Emission Test Report, U.S. Sugar Company, Bryant, Florida," Monsanto Research Corp., May 1980).

MAXIMUM EMISSIONS CALCULATIONS

1. Particulate
   Maximum emissions occur when burning 100-percent bagasse since heat input is greatest = 100.8 lb/hr

2. Sulfur Dioxide
   Maximum emissions occur when burning oil up to 250 x 10^6 MM Btu/hr with remainder of steam capacity supplied by bagasse residue
   SO_2 due to oil = 276.9 lb/hr
   Steam due to oil = 250 x 10^6 MM Btu/hr ÷ 1,050 Btu/lb steam x 0.8 = 190,476 lb/steam/hr
   Steam due to residue = 264,000 - 190,476 = 73,524 lb/steam/hr
   Residue required = 73,524 x 1,050 ÷ 0.625 ÷ 8,900 = 13,879 lb/hr (dry)
   SO_2 due to residue = 13,879 x 0.004 x 2 x 0.6 = 66.6 lb/hr
   Total SO_2 = 276.9 + 66.6 = 343.5 lb/hr

3. Nitrogen Oxides

Fuel-oil burning produces maximum NO_x emissions, with bagasse next. Therefore, maximum NO_x occurs when burning maximum fuel with the rest of the steam supplied by bagasse.

NO_x due to oil = 105.8 lb/hr
Steam due to oil = 190,746 lb steam/hr (see SO_2 above)
Steam due to bagasse = 73,524 lb steam/hr
Bagasse required = 73,524 x 1,050 ÷ 0.55 ÷ 8,000
= 17,546 lb/hr (dry)
NO_x due to bagasse = 17,546 x 2.67 ÷ 2,000 = 23.4 lb/hr
Total NO_x = 105.8 + 23.4 = 129.2 lb/hr

4. Carbon Monoxide and Hydrocarbons

Maximum emissions when burning all bagasse = 140 lb/hr

ACTUAL EMISSIONS CALCULATIONS

Annual emissions for proposed Boiler 8 based on fuel mix presented in Table A-3 of PSD report for 184 day/yr. For off-season operation (120 days/yr), bagasse is not available; therefore, emissions based upon average fuel oil consumption with remainder of steam produced from residue and assuming maximum steam production of 264,000 lb/hr. This figure is much higher than will actually occur on average during off season.

1. Particulate (based upon allowables)

Crop season:
18.3 ton/hr residue x 2,000 x 8,900 x 0.2 lb/MM Btu x 24 x 184
÷ 2,000 = 143.8 ton/yr
7.5 ton/hr bagasse x 2,000 x 8,000 x 0.2 lb/MM Btu x 24 x 184
÷ 2,000 = 53.0 ton/yr
64 gal/hr x 8.1 x 17,500 x 0.1 lb/MM Btu x 24 x 184 ÷ 2,000 =
2.0 ton/yr

Off season:
Average steam due to oil = 6,900 lb/hr
Average steam due to residue = 264,000 - 6,900 = 257,100 lb/hr
Residue required = 257,100 x 1,050 ÷ 0.625 ÷ 8,900 = 48,531 lb/hr
48,531 lb/hr residue x 8,900 x 0.2 lb/MM Btu x 24 x 120 ÷ 2,000
= 124.4 ton/yr
64 gal/hr x 8.1 x 17,500 x 0.1 lb/MM Btu x 24 x 120 ÷ 2,000
= 1.3 ton/yr

Total = 324.5 ton/yr

2. Sulfur Dioxide

Crop season:
18.3 ton/hr residue x 0.004 x 2 x 0.6 x 24 x 184 = 387.9 ton/yr
7.5 ton/hr bagasse x 0.001 x 2 x 0.6 x 24 x 184 = 39.7 ton/yr
64 gal/hr x 157 lb/10^3 gal x 24 x 184 ÷ 2,000 = 22.2 ton/yr

Off season:
64 gal/hr x 157 ÷ 1,000 x 24 x 120 ÷ 2,000 = 14.5 ton/yr
48,531 lb/hr residue x 0.004 x 2 x 0.6 x 24 x 120 ÷ 2,000 = 335.4 ton/yr

Total= 799.7 tons/yr

3. Nitrogen Oxides

Crop season:
18.3 ton/hr residue x 2.18 lb/ton x 24 x 184 ÷ 2,000 = 88.1 ton/yr
7.5 ton/hr bagasse x 2.67 lb/ton x 24 x 184 ÷ 2,000 = 44.2 ton/yr
64 gal/hr x 60 lb/10^3 gal x 24 x 184 ÷ 2,000 = 8.5 ton/yr

Off season:
64 gal/hr x 60 ÷ 1,000 x 24 x 120 ÷ 2,000 = 5.5 tons/yr
48,531 lb/hr residue ÷ 2,000 x 2.67 x 24 x 120 ÷ 2,000 = 93.3 tons/yr

Total = 239.6 tons/yr

4. Carbon Monoxide and Hydrocarbons

Crop Season:
18.3 ton/hr residue x 24 x 3.64 x 184 ÷ 2,000 = 147
7.5 ton/hr bagasse x 24 x 4.44 x 184 ÷ 2,000 = 74
64 gal fuel oil/hr x 24 x 1/10^3 x 184 ÷ 2,000 = 0.1
64 gal fuel oil/hr x 24 x 5/10^3 x 184 ÷ 2,000 = 0.7

Off Season:
24.27 ton/hr residue x 24 x 3.64 x 120 ÷ 2,000 = 127
64 gal fuel oil/hr x 24 x 1/10^3 x 120 ÷ 2,000 = 0.1
64 gal fuel oil/hr x 24 x 5/10^3 x 120 ÷ 2,000 = 0.5

Total HC = 348 ton/yr
Total CO = 349 ton/yr

POTENTIAL EMISSIONS CALCULATIONS

Potential emissions based upon burning worst-case emitting fuel all the time and 304-day operation per year. No controls considered.

1. Particulate

Worst-case fuel is bagasse at maximum steam production.
63,000 lb/hr bagasse (dry) ÷ 2,000 x 35.6 lb/ton = 1,121.4 lb/hr
1,121.4 lb/hr x 24 x 304 ÷ 2,000 = 4,091 ton/hr

2. Sulfur Dioxide

Worst-case fuel is oil, burning up to 250 MM Btu/hr.
Remainder of steam produced from residue.
Oil: 1,764 gal/hr x 157 lb/10^3 gal = 276.9 lb/hr = 1,010.3 ton/yr
Residue: 13,879 lb/hr x 0.004 x 2 = 111.0 lb/hr = 405.0 ton/yr

Totals = 387.9 lb/hr = 1,415.3 ton/yr

3. Nitrogen Oxides
Worst-case fuel is oil, with bagasse next.
Oil = 105.8 lb/hr (see Maximum Emissions Calculations)
= 386.0 ton/yr
Bagasse = 23.4 lb/hr = 85.4 ton/yr

Totals = 129.2 lb/hr = 471.4 ton/yr

4. Carbon Monoxide and Hydrocarbons

Crop season: 100-percent bagasse
140 lb/hr x 24 x 184 ÷ 2,000 = 309 ton/yr

Off season: 100-percent residue
90.7 lb/hr x 24 x 120 ÷ 2,000 = 131 ton/yr

Total = 440 ton/yr

EXECUTIVE SUMMARY OF PERMIT APPLICATION AND PSD REPORT--SUGAR CANE GROWERS COOPERATIVE, BOILER 8

The Sugar Cane Growers Cooperative (SCGC) mill currently generates steam with seven boilers: two package boilers burning oil only, each rated at 120,000 pounds of steam per hour; one boiler burning bagasse and oil to produce 100,000 pounds of steam per hour; and four triple-fuel boilers capable of burning bagasse (ground cane), bagasse residue, and oil to produce a total of 640,000 pounds of steam per hour. Construction of a fifth triple-fuel boiler rated at 240,000 pounds of steam per hour is proposed. This new boiler is designated Boiler 8.

The steam produced by these boilers is used in three areas: steam turbines to move equipment and equipment auxiliaries; processing of juice to produce sugar; and furfural extraction from bagasse at an adjacent, independently owned and operated plant. The fuel of preference is the bagasse residue, that remains after fufural extraction. The capacity of the furfural plant will limit available residue to 1,500 tons/day. Bagasse is burned as necessary to supplement steam requirements. Under normal operating conditions, oil is burned only to aid in stable boiler operation, and to meet steam demands with the two package units.

At times, the furfural plant is inoperative and/or there is a brief shortage of cane. Steam demands for grinding or furfural extraction are then reduced or non-existent. Processing of juice that is already extracted must be completed, and when the production of bagasse or residue ceases, the steam demands for the juice processing are met by firing oil. Under these short-term conditions, steam demands are less than 500,000 pounds per hour.

During the off season when no cane is ground, SCGC provides process steam to the furfural extraction plant to complete processing of stock-piled bagasse. This steam is produced by burning the bagasse residue and minimal oil in three or fewer boilers. Maximum steam demands during this period are approximately 400,000 pounds per hour. Off season operations may be carried out during the month preceding and 3 months following the crop season, although they are not necessarily continuous over this period. Steam requirements, fuel mix, plant operation, and total emissions during the off season will not change as a result of adding Boiler 8. If Boiler 8 is used during the off season, improved dispersion of emissions over the existing situation will be realized.

With Boiler 8 burning its allotment of bagasse residue, typical daily fuel consumption of Boiler 8 during the crop season is projected to be 439 tons of residue, 180 tons of bagasse, and 1,536 gallons of oil. Sulfur dioxide (SO_2) emissions at this rate are 2.5 tons per day. If only bagasse were burned, maximum particulate emissions at 0.2 lb/10^6 Btu would be 1.2 tons per day. These figures include a 10-percent peak capacity factor. Emissions from the existing boilers will not increase. Thus, the net plant-wide increases in annual emissions due to the proposed change, based on a maximum anticipated crop season of 184 days, are 460 tons SO_2 and 221 tons of particulate matter (PM). The higher figures given in Section IIIC of the permit reflect actual emissions from Boiler 8 as if it were operated continuously throughout the crop season and off season (304 days). As previously discussed, any off-season emissions from Boiler 8 will be offset by a reduction from the other boilers.

The existing boilers are permitted at 0.2 or 0.3 lb PM/10^6 Btu, and the package oil-firing boilers, each rated at 120,000 pounds of steam per hour, are permitted at 0.1 lb PM/10^6 Btu. In actual operation, the boilers permitted at 0.3 lb PM/10^6 Btu have never exceeded 0.25 lb/10^6 Btu, and the package units each have been derated to 75,000 pounds of steam per hour. These actual conditions were used in modeling the existing plant to determine the net change in air quality, and it is agreed that they should be included as enforceable limits in the permit conditions. These changes reflect permit conditions only and are not creditable according to EPA definitions.

Modification of the existing stack configuration is necessary to improve dispersion sufficiently to allow operation of Boiler 8 without causing a modeled violation of air quality standards. Concurrent with the construction of Boiler 8, the three stacks serving Boiler 4 will be ducted into a common stack 110 feet tall, and the exit gases from Boilers 6 and 7 will share a common stack. Combining exit gas streams in this manner increases the thermal buoyancy of the plume over that of the plume from the separate stacks.

The greatest particulate emissions from all combination boilers (oil and non-fossil fuel) occur when total steam production is from non-fossil fuel combustion. Modeling of maximum emissions over the crop year shows that the highest, second-highest 24-hour impact, 149 ug/m^3, does not exceed Florida's standard of 150 ug/m^3. Impacts during the off season were not modeled, since emissions will be less than half those during the crop season.

At maximum steam production when oil usage is at a minimum, the greatest SO_2 impacts will occur when the most residue is burned. Modeling was performed with a worst-case fuel mix, including sufficient oil to fire each of the package boilers at a maximum capacity of 175,000 lb steam/hr and to stabilize the combination boilers. Under these conditions, the projected highest, second-highest 24-hour concentration is 249 ug/m^3 and the highest, second-highest 3-hour concentration is 492 ug/m^3.

When bagasse or residue is not available for combustion and steam demand is decreased as discussed previously, additional oil may be burned. The steam required to complete processing of the already extracted juice (no more than 500,000 lb/hr) can be produced totally from oil without increasing emissions over those during full plant operation. Investigation of the critical 3-hour meteorological period identified for the full steam production scenario shows that up to 550,000 pounds of steam per hour can be produced from oil and that exit gases can be cooled by passing through the scrubbers without violating the 3-hour standard of 1,300 ug/m^3.

The effects of such short-term operation on the 24-hour SO_2 standard were investigated by modeling with the critical 24-hour meteorological period. Without exceeding 260 ug/m^3, up to 120,000 gallons of oil per day (3 times the modeled average) can be burned while producing steam at 89-percent rated capacity if the steam rate reduction is decreasing the residue comsumption from 1,500 to 1,200 tons per day.

The improved dispersion from the proposed stack modifications provides a net air quality improvement over existing conditions for both TSP and SO_2; thus, no explicit analysis of increment consumption was performed.

The range of conditions required for operation of the SCGC mill is within the range of conditions that ensures compliance with AAQS. These conditions have been expressed as allowable emission factors for each fuel burned in the new boiler, and a plant-wide limit on total SO_2 emissions. The emission factors for the new boiler in lb/10^6 Btu are:

	Oil	Bagasse	Residue
PM	0.1	0.2	0.2
SO_2	2.1	0.15	0.54

These values are based on a 40-percent removal of theoretical SO_2 while burning non-fossil fuel; and on an average oil sulfur content of 1.8 percent with the assumption that no SO_2 from oil combustion is removed by the scrubbers.

Total plant-wide SO_2 emissions will be limited to 14 tons per day and 2.1 tons per 3-hour period. The proposed method of showing compliance with SO_2 standards is to monitor usage of each fuel and use the emission factors to calculate total emissions for comparison with allowable limits. Compliance with particulate standards will be determined by conventional stack testing.

BACT for particulate emissions was determined to be impingement scrubbing. Baghouse filtration and ESP were rejected for lack of demonstrated operational capability on bagasse or residue-fired boilers. Venturi scrubbing was rejected since no conclusive evidence exists that its performance is superior to impingement scrubbing, and installation and operating costs of a venturi scrubber are greater than those of an impingement scrubber.

An emission limit of 0.2 lb PM/10^6 Btu while burning non-fossil fuel is proposed. This number results from the same methodology used to determine BACT for the U.S. Sugar Bryant mill. It is the emission level achieved 80 percent of the time during stack tests performed at the SCGC mill over the past 5 years. This emission rate reflects operation according to manufacturer's recommendations and is believed to be the lowest practically achievable with the particle size characteristics encountered.

The impingement scrubber was also chosen as BACT for SO_2. Comparison of stack test results with theoretically calculated SO_2 emissions from bagasse and residue indicate an SO_2 loss of about 40 percent during the combustion and scrubbing processes. This reduction is achieved at no incremental cost above that for particulate control. Additionally, effluent from the proposed impingement scrubber can be handled by the existing wastewater treatment system. The additional SO_2 removed from the new boiler emissions by an add-on scrubber system does not justify the high capital and operating costs of such a system or the separate waste handling facilities which would be required, particularly since the project will result in a net improvement over existing SO_2 air quality.

PROPOSED LAER FOR
SUGAR CANE GROWERS
COOPERATIVE, BOILER # 8.

PROPOSED LAER FOR SUGAR CANE GROWERS COOPERATIVE BOILER 8

No emission factors specific to bagasse- or residue-fired boilers is available for hydrocarbons. Appendix C of AP-42 lists 2 lb/ton of bagasse burned, but no reference or basis for this figure is provided. It is not known whether the factor refers to total or non-methane hydrocarbons, or whether the bagasse is to be measured on a dry or wet basis. On the basis of this figure, the net plant-wide increase in hydrocarbon emissions due to the addition of Boiler 8 is 306 tons/year (see attachment).

Since the SCGC mill is located in an area classified as nonattainment for ozone, an increase in reactive hydrocarbon emissions of 306 tons/year subjects the new boiler to LAER requirements.

The attached letter from the boiler manufacturer documents that the equipment is designed for maximum thermal efficiency, which is directly related to the most complete combustion possible of volatilized hydrocarbons. A recent report to the Florida Public Service Commission indicates that while coal and oil boilers are operated within the range recommended by the manufacturer, optimization of such parameters as air register settings and burner position results in improvements of no more than 1 percent.[1]

A report to the Technical Association of the Pulp and Paper Industry indicates that hydrocarbon emissions from wood-waste-fired boilers decrease as the percent over-fire air is increased.[2] The proposed boiler design has provisions for over-fire air and it is expected to be operated at optimum over-fire air, consistent with best combustion efficiency.

The proposed LAER for Boiler 8 is that achieved by good boiler design and proper operation.

There is sufficient new source allowance in Palm Beach County to assign 306 tons to SCGC without obtaining emissions offsets. If source testing discloses that actual emissions from bagasse and bagasse residue are significantly less than this, the unneeded allowance will be made available for reassignment.

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[1]Boiler Efficiency Improvement. Prepared by KVB, Inc., Houston, Texas, for the Florida Public Service Commission. 1980.

[2]Volatile Organic Compound Emissions from Pacific Northwest Pulp and Paper Industry Combustion Sources. Dallons, V. and Simon, C. Proceedings of the Technical Association of the Pulp and Paper Industry 1981 Environmental Conference April 27-29, New Orleans, LA.

ATTACHMENT

Additional Hydrocarbon Emissions from SCGC Boiler #8

Basis: 1) Crop season 184 days
2) Worst case fuel: bagasse has highest required Btu input per lb steam

$$(264{,}000 \text{ lb steam/hr}) \times (1050 \text{ Btu/lb steam}) \times \frac{1}{0.55} = 504 \times 10^6 \text{ Btu/hr}$$

$$(504 \times 10^6 \text{ Btu/hr}) \times (1 \text{ lb dry bagasse/8000 Btu}) \times (2.2 \text{ lb wet/lb dry}) \times (1 \text{ ton/2000 lb}) = 69.3 \text{ ton wet bagasse/hr}$$

AP-42 Appendix C NEDS SCC and Emission Factor Listing (11/78)

External Combustion Boilers - Bagasse

Hydrocarbon Emissions: 2 lb/ton burned

$$(2 \text{ lb/ton}) \times (69.3 \text{ ton/hr}) \times (24) \times (184) \times (1/2000) = 306 \text{ tons } \underline{\text{total}} \text{ hydrocarbon/year}$$

RILEY

RILEY STOKER CORPORATION

POST OFFICE BOX 547
WORCESTER, MASSACHUSETTS 01613
(617) 852-7100

Address reply to:
HEYWARD INCORPORATED
Almand Building, Suite 6
2105 Park Avenue
Orange Park, Florida 32073
Tel.: (904) 264-3555

May 13, 1981

Sugar Cane Growers Cooperative of Florida
P. O. Box 666
Belle Glade, Florida 33430

Attention: Mr. Enrique Arias, Vice President

Subject: Sugar Cane Growers Cooperative of Florida
Boiler No. 8
Riley Contract No. 81002

Gentlemen:

In response to your questions, concerning the improvement of the efficiency of the new unit, Riley Stoker Corporation has designed a state of the art steam generator for the fuel to be burned. This unit includes all of the known heat recovery devices, such as economizer, air heater and a large conservative furnace. We do not feel that any significant improvement in the efficiency of the units can be made mechanically.

Very truly yours,

HEYWARD INCORPORATED
FOR: RILEY STOKER CORPORATION

E. H. Pearch
Jacksonville Office

EHP/G

PROPOSED METHOD OF SHOWING COMPLIANCE WITH SULFUR DIOXIDE AIR QUALITY STANDARDS

The Sugar Cane Growers Cooperative (SCGC) will produce steam with a total of eight boilers: two burning exclusively oil, one capable of burning oil and bagasse, and five capable of burning oil, bagasse, and bagasse residue. The capacity of the mill and adjacent furfural extraction plant limits available residue to 1,500 tons per day.

On a 24-hour basis, the greatest sulfur dioxide (SO_2) impacts will occur when the maximum amount of residue is burned. While the plant is producing steam at or near capacity, residue and bagasse usage is maximized and oil usage is minimized. Under certain adverse conditions, supplies of residue and bagasse may be limited for several hours, and steam to complete processing of the extracted sugar must be provided by increasing oil usage above the average hourly rate. No new materials are being processed during such periods, and total steam generation, as well as total SO_2 emissions, are reduced.

Dispersion modeling has shown that SO_2 standards will not be violated when the mill is operated under conditions producing maximum SO_2 emissions on a 24-hour basis. The conditions include consumption of 1,500 tons per day of residue, 39,100 gallons per day of oil at 1.8-percent sulfur content, and 900 tons per day of bagasse. Total SO_2 emissions under these conditions are 14 tons per day. This limit will never be operationally exceeded, since any increase in oil consumption above that used in the model will always occur simultaneously with a decrease in residue and bagasse consumption. An investigation of critical dispersion conditions shows that oil usage could be increased three times, to an uneconomical amount of 120,000 gallons per day, while 89-percent total steam generating capacity is maintained on each boiler without exceeding 24-hour SO_2 standards or emitting more than 14 tons of SO_2 per day.

The practical limit of oil consumption is reached when no residue or bagasse is available and steam is produced exclusively from oil. The PSD report shows that 3-hour SO_2 impacts under worst-case daily fuel conditions are 492 ug/m^3, which is 38 percent of the AAQS of 1,300 ug/m^3. Under the flow conditions described in Appendices A and B, Boilers 6 and 7 (package units burning oil only) could continue producing 150,000 pounds per hour of steam, and Boilers 1 through 5 could produce an additional 400,000 pounds per hour from oil alone without violating the 3-hour standard. Plant-wide SO_2 emissions under these conditions would be 2.1 tons during a 3-hour period. The particular combination of boilers producing the 400,000 pounds per hour does not affect these results, since they were obtained by assuming minimum buoyancy conditions, which would occur when the emissions are apportioned over all available stacks. Practically, SO_2 impacts occurring while burning oil alone could be mitigated further by bypassing the scrubbers, thus avoiding an unnecessary cooling of exit gases (modeling assumed no removal of SO_2 from oil-burning emissions).

The preceding analysis was based on the SO_2 emission factors proposed as BACT: 0.15 lb/10^6 Btu from bagasse, 0.54 lb/10^6 Btu from bagasse residue, and 2.1 lb/10^6 Btu from oil for the proposed boiler. These factors include a 40-percent loss in theoretical SO_2 while burning bagasse and residue; the factor for oil is based on a sulfur content of 1.8 percent and heating value of 17,500 Btu per pound.

Compliance with air quality standards is assured if plant-wide SO_2 emissions are limited to 14 tons per day and 2.1 tons per 3-hour period. The proposed method of showing compliance is the most direct: total fuel usage shall be recorded and the individual emission factors applied to determine total emissions for comparison with the plant-wide limit according to the equation:

$$0.00120 \times (\text{tons dry bagasse}) + 0.00481 \times (\text{tons dry residue}) + 0.147 \times (1{,}000 \text{ gallons oil}) \leq \begin{cases} 14 \text{ on a 24-hour basis} \\ 2.1 \text{ on a 3-hour basis.} \end{cases}$$

Records of the sulfur content of oil as received shall be kept to document that the daily average is not greater than 1.8-percent sulfur.

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

June 25, 1981

Enrique R. Arias
Executive Vice President
Sugar Cane Growers Cooperative
of Florida
Post Office Box 666
Belle Glade, Florida 33430

Dear Mr. Arais:

RE: Air Construction State Permit Application, AC 50-42476

The Department has received your response to our letter of May 21, 1981 that requested additional information for the application for permit to construct a bagasse boiler in Palm Beach County, Florida. Based on our review of your May 29, 1981 response, it has been determined that more information is needed before we can process the application. The information required to complete the application is listed below.

1. The Department can not agree or accept a 40% loss in the system of the potential SO_2 emissions while burning bagasse and residue. There are not enough tests and documents in the application to support the system SO_2 loss. Please recalculate the SO_2 emissions based on maximum sulfur in the fuels and using no system SO_2 loss.

2. Based on your response to question #7, SO_2 emissions from burning bagasse and residue should be recalculated using 0.2% and 0.5% sulfur content respectively, instead of 0.1% and 0.4%. Recalculate the SO_2 emissions from burning oil using 18,500 Btu/lb, the actual heat value, instead of 17,500 Btu/lb.

3. The response to question #8 was not correct. The factor for residue should be 1 ton wet/0.6 ton dry, not 1 ton wet/0.55 ton dry. Recalculate the particulate and NO_x emissions from residue with the correct factor, 1 ton wet/0.6 ton dry.

4. Based on the above questions, recalculations are required for Attachment A (Proposed Boiler No. 8 Emission Estimated), Appendix A (Emission Calculations, including Table A-1, A-2 and A-3) and Table 18A, 18B of your application and incompleteness response.

These recalculations are required for all boilers in Tables A-3, 18A and 18B; recalculated values in these tables will affect the inputs to the computer modeling. Please include printouts from any additional modeling required by these recalculations.

5. The normal moisture content for bagasse (wet) is approximately 55%. Why was the percent moisture of the two bagasse samples for test analysis so low (3.7% and 4.6%)?

6. Question #12 on your response states that residue is weighed on belt scales. Where are these belt scales located? Can bagasse fuel to the boilers be measured in this manner? If not, how will the heat input to the boiler be obtained during compliance test?

7. Based on oil consumption listed in the boiler specification and the actual Btu content of the oil, the maximum heat input to the boiler from oil will be $290x10^6$ Btu/hr. How will the heat input from oil to the proposed boiler be limited to $250x10^6$ Btu/hr? Please describe any mechnical devices, such as an orifice, that will be used to restrict oil flow.

8. We understand that a response to question #30 from the first incompleteness letter is being prepared by ESE. We have not received this response yet.

As soon as the requested information is received, we will resume processing your application. If you have any questions on the data requested, please contact this office. Cleve Holladay should be contacted on any questions related to modeling and Willard Hanks/Bob King on the other data requested.

Sincerely,
Willard Hanks
for
Clair Fancy
Deputy Bureau Chief
Central Air Permitting Section

CF:BK:dav

cc: Mirza Baig, South Florida District
Michael Martin, Palm Beach County Health Department
William Green, Hopping, Boyd, Green and Sams
David Buff, ESE

PSD-FL-077 AC 50-42476

ESE ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

July 15, 1981
ESE No. 80-190-100

JUL 1981
BUREAU
A O M

Mr. Clair Fancy
Deputy Bureau Chief
Central Air Permitting Section
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32301

Re: Sugar Cane Growers Cooperative, Boiler #5
Federal PSD Permit Application, PSD-FL-077
Air Construction Permit Application, AC-42476

Dear Mr. Fancy:

This letter serves to document the agreements reached during the 10 July 1981 meeting in Tallahassee relating to the questions in your letter of 25 June 1981 to Enrique Arias.

Questions 1 and 2

The PSD report and addenda demonstrate that AAQS for sulfur dioxide (SO_2) will be met if plantwide emissions are limited to 14 tons per day (tons/day). Sugar Cane Growers Cooperative's (SCGC) original proposal for ensuring that this limit would be met assumed that the sulfur content for bagasse and residue was 0.1 and 0.4 percent, respectively. However, the Department was concerned that the higher values of 0.2 and 0.5 percent, reflected in certain individual tests, might more accurately reflect the sulfur content of these fuels, and therefore, indicate the potential for exceeding the 14-ton limit. As we discussed, the number of significant figures of the above-referenced fuel measurements and the relatively limited number of tests point to the conclusion that additional tests would be valuable. Moreover, as we also discussed, the 40-percent systemwide removal of SO_2 when bagasse and/or residue is combusted is believed to be a conservative figure.

At the meeting, SCGC suggested that one approach would be to limit the amount of residue which could be burned, consistent with the higher fuel sulfur content assumption, until further tests could justify raising the residue limit. The Department indicated a desire to establish emission limitations and allow the source latitude to ensure that the limit would be met. Upon further reflection, SCGC completely concurs with the Department and proposes that the permit establish a minimum SO_2 removal for the system of 40 percent when burning residue and/or bagasse and a maximum emission rate of 14 tons, without setting specific limits on the amount of each fuel which may be burned. We would anticipate obtaining more detailed information on actual SO_2 removal performance and fuel sulfur content prior to enduring the initial performance test in order to further confirm the ability of the new boiler to meet these two requirements.

Recalculation of SO_2 emissions due to oil consumption resulted in lower emissions when 18,500 Btu/lb was substituted for 17,500 Btu/lb. This change was minimal.

Question 3

The NO_x calculations were corrected in Tables 18A and 18B, Attachment A, and Section IIIC, and were distributed at the meeting.

Question 4

No additional modeling is required since emission rates are not changed.

Question 5

The discrepancy in the bagasse moisture content is due to initial drying of bagasse samples prior to shipment to the laboratory. This drying is necessary to prevent fermentation of the sugar in the bagasse during shipment. The average bagasse moisture content as measured at the mill is approximately 55 percent.

Question 6

A diagram of the bagasse and residue handling system was distributed. This diagram located the belt scales. The fuel supplied to the mill is measured either directly or by heat balance. The fuel rate to an individual boiler cannot be measured directly because it is not possible to feed the boiler by belt conveyor. Heat input during a compliance test will be determined by the heat balance method used in the industry.

Question 7

Oil consumption will be recorded by oil meters and reported on a 24-hour basis.

Question 8

A reply to the question on choice of background values had been submitted previous to the meeting. Further analysis was proposed by Larry George. The results of this analysis are included in a report under separate cover.

In addition to the information requested in the aforementioned letter, comments from the South Florida District and the Palm Beach County Health Department were addressed. In response to these comments, (1) it was stated that the current provisions for control of fugitive emissions from bagasse handling and storage are sufficient, (2) SCGC agreed to provide the Department with a copy of the manufacturer's boiler performance test, and (3) it was explained that a vendor guarantee of scrubber performance based on inlet loading and particle size distribution is not feasible and would be of no practical value.

This information should suffice to resolve any questions concerning compliance enforcement and the maintenance of Air Quality Standards and allow final processing toward approval of the construction permit. If any issue requires further clarification, do not hesitate to telephone Mr. Arias or me.

On behalf of our client we appreciate your continuing cooperation and attention in this matter.

Sincerely,

David A. Buff

David A. Buff, P.E.
Senior Engineer
Project Operations

DAB/kc

cc: Bill Green
Enrique Arias
Mirza Baig
Michael Martin

ESE ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

July 22, 1981
ESE No. 80-190-100

JUL 1981
BUREAU
A Q M

Clair Fancy
Deputy Bureau Chief
Central Air Permitting Section
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Subject: Sugar Cane Growers Cooperative, Boiler #8
Federal PSD Permit Application, PSD-FL-077
Air Construction Permit Application, AC-42476

Dear Mr. Fancy:

Enclosed is a report describing the results of the additional analysis of background TSP data requested by Larry George during the 10 July 1981 meeting in Tallahassee.

Please do not hesitate to contact me with any questions.

Sincerely,

David A. Buff

David A. Buff, P.E.
Senior Engineer
Project Operations

DAB/sn

cc: Bill Green (with enclosures)
Enrique Arias (with enclosures)

P.O. BOX ESE • GAINESVILLE, FLORIDA 32602 • 904/372-3318 • TWX 810-825-6310

MONITORING DATA

Printouts 1 and 3 demonstrate that the measured concentration data from PB-16 and PB-19 for the years 1978 to 1980 are not well described by a normal distribution curve. Printouts 2 and 4 show the results of taking the log transform of the two data sets. In both of these cases, the mean and median values for each station are within 0.01; this is one indication of a good fit to a log-normal distribution.

In the log domain, the data sets can be described as follows:

	Mean	Standard Deviation
PB-16	3.44742	0.410849
PB-19	3.98112	0.346605

The area under the normal curve above 150 ug/m^3, and thus the probability of encountering a value above 150 ug/m^3 on a given day, can be found by determining the number of standard deviations 150 is above the mean, and reading the area from a table of values for the normal probability function.

$$\text{Number of standard deviation} = \frac{\ln(150) - \text{mean}}{\text{standard deviation}}$$

	Number of Standard Deviations	Normal Probability
PB-16	3.805	0.000071
PB-19	2.970	0.0015

Thus, the chances of PB-16 or PB-19 measuring a concentration greater than 150 on any given day are 0.0071 percent (once every 38.6 years) and 0.15 percent (once every 1.8 years), respectively, based on the last 3 years of measured data at these stations.

BINOMIAL DISTRIBUTION

These individual daily probabilities may be used to determine the probability of a violation in any year (i.e., two exceedances in 1 year). This is done by means of the bionominal distribution function:

$p(x) = \binom{n}{x} p^x (1-p)^{n-x}$

p(x) = probability of exactly x occurrences (exceeding 150) in n trials (days)

p = probability of occurrence (exceeding 150) in single trial (day)

$\binom{n}{x} = \frac{n!}{(n-x)!x!}$

Considering the actual monitoring data at PB-16 and PB-19, these equations yield:

	PB-16	PB-19	
p(monitor exceeds 150 on any given day)	.000071	.0015	
p(x=0)	0.974	0.580	- probability that 150 is never exceeded in any 365-day period.
p(x=1)	0.025	0.320	- probability that 150 is exceeded exactly one time in any 365-day period.
$p(x \geq 2)$*	0.001	0.10	- probability that 150 is exceeded two or more times in any 365-day period.
$1/p(x \geq 2)$	1,000 yrs	10 yrs	- expected return period for air quality violation.

*$P(x \geq 2) = 1 - [p(o)+p(1)]$

As the figures show, PB-16 currently displays a much lower probability of violating the 24-hour TSP standard than does PB-19. This result is not surprising considering the urban location of PB-19 and the nearly rural location of PB-16, except for the large traffic volume along U.S. 98.

PROJECTED CONCENTRATIONS

Modeled plant concentrations at the point of highest, second-highest impact were determined with the ISCST model. A total of 1,827 24-hour TSP concentrations due to SCGC mill emissions were calculated by the model, including two leap years which contained 366 days.

The concentrations were found to fit a two-part distribution--622 of the 1,827 daily values were zero; the remaining values fit an exponential distribution (see Printout 5).

With the modeled and measured (assumed to be all background) data sets thus described, it is possible to calculate the probability that on any given day the plant and background contributions will add to produce a total concentration greater than 150 ug/m^3 when the background concentration is less than 150 ug/m^3. The mathematical expression of this probability is described in the McClave report (letter to C. Fancy, July 6, 1981). Numerical evaluation of this expression yields:

	PB-16	PB-19
Probability that plant emissions cause exceedence of 150 ug/m^3 when background is less than 150 ug/m^3	0.000331	0.000290

This probability excludes all cases where the background was already above 150 ug/m^3 even without plant contributions. This exclusion is responsible for the lower probability using PB-19, since there are less days when background is expected to be below 150 ug/m^3.

Using the binomial theorem to determine the probability of exceedances and violations for this case yields:

	PB-16	PB-19
p(plant emissions cause exceedence on any given day when background is less than 150 ug/m^3	0.000331	0.000290
$p(x=0)$	0.8862	0.8996
$p(x=1)$	0.1071	0.0952
$p(x\geq2)$, plant causes violation)	0.0067	0.0052
$1/p(x\geq2)$, return period	149 yrs	192 yrs

COMBINED PROBABILITIES

The probability that there will be any exceedence due to background, plant emissions, or any combination of the two, is the sum of the probability that the background is above 150 ug/m^3 regardless of plant contributions and the probability that plant emissions cause an exceedence when the background is less than 150 ug/m^3.

The physical analog that would actually be represented by this assumption is construction of a new facility, equivalent to the entire SCGC mill, 800 meters from the monitoring stations.

	PB-16	PB-19
p(background $\geq$150)	0.000071	0.0015
p(plant causes exceedence)	0.000331	0.000290
p(exceedence by any means)	0.000402	0.00179
p(x=0)	0.864	0.520
p(x=1)	0.127	0.340
p(x$\geq$2, violation predicted)	0.009	0.14
1/p(x$\geq$2)	111 yrs	7 yrs

Addition of plant impacts reduces the expected period of return of a violation from 1,000 yrs to 111 yrs using PB-16 and from 10 yrs to 7 yrs using PB-19. In reality, the return period for a violation will not actually decrease at these stations if they are currently influenced by the SCGC mill, since the proposed modification is predicted to improve air quality.

The probability that plant emissions contribute more than 10 ug/m^3 to an existing exceedance or violation can be approximated as follows:

p(contribute to existing exceedence) = p(background >150) x p(plant contribution >0) x p(plant contribution >10)

Printout 5 shows the 50-percentile level for plant contributions is 11 ug/m^3. Thus:

p(contribute to existing exceedence) approximately =

(0.000071) (0.66) (0.50) = 0.000023 (PB-16)

(0.0015) (0.66) (0.50) = 0.000495 (PB-19)

	PB-16	PB-19
p(contribute to exceedence)	0.000023	0.000495
p(cause exceedence)	0.000331	0.000290
p(cause or contribute)	0.000354	0.000785
p(x=0)	0.8788	0.7508
p(x=1)	0.1133	0.2153
p(x≥2)	0.0079	0.0339
1/p(x≥2)	126 yrs	29 yrs

REVIEW OF ASSUMPTIONS

As explained in the PSD report, the proposed modification is predicted to improve air quality at all points. The actual effect upon the PB-19 monitor will be to increase the expected violation return period for 24-hour TSP concentrations, i.e., longer time interval between expected violations. Annual average TSP impacts at the monitor due to SCGC are predicted to decrease as a result of the modification.

The preceeding analysis was an attempt to characterize air quality at a point 800 meters west of the SCGC mill by assuming that values observed at PB-16 and PB-19 would also be observed at that point in the absence of any mill emissions. The resulting figures, therefore, are considered conservative, since PB-19 is potentially influenced by the SCGC mill and PB-16 is potentially influenced by the Atlantic Sugar mill. Unrefined modeling has indicated that existing maximum 24-hour TSP impacts upon PB-19 from the SCGC mill could be up to 40 ug/m^3. PSD modeling performed for Atlantic Sugar indicates this mill could impact PB-16 by 10 ug/m^3 or more on a 24-hour average. As a result, mill impacts could be double counted by assuming measured concentrations at these stations are purely background, with no mill contributions.

If the standard deviation of PB-19 measured data remained consistent and the mean were reduced by 3 ug/m^3 to account for influence by the existing mill facilities, the expected violation return period would approximately double, i.e., twice as long between expected violations.

In addition, PB-19 monitored data, because of the monitor's urban location and influence from the city of Belle Glade (traffic, industrial operations, etc.), are considered not to be representative of background TSP concentrations existing in the area of SCGC mill highest, second-highest predicted impact, i.e., 800 meters from the mill in an open field.

The above analysis also does not consider the conservativeness of the entire modeling approach, where maximum steam load conditions and particulate matter emission rates are assumed to occur every hour of the year. Historical particulate test data at the mill indicate that emissions vary with time, and from boiler to boiler. Thus, the probability of all boilers emitting the maximum modeled rate for a 24-hour period is very small.

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(5) MODELED IMPACT SUMMARY

ESE AIR QUALITY PROJECT 18:41 MONDAY, JULY 6, 1981 3

DISTRIBUTIONAL CHARACTERISTICS OF PLANT ~~EMISSION~~ Concentration

UNIVARIATE

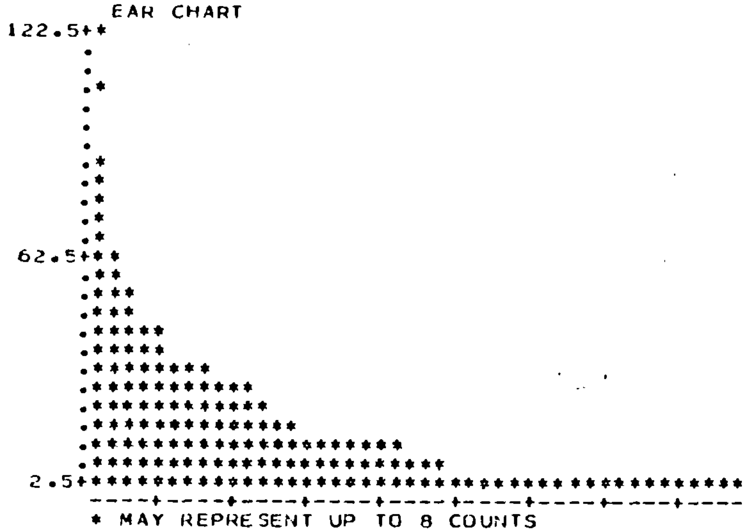
VARIABLE=PCS_LEVL   POSITIVE ~~EMISSION~~ concentration VALUES

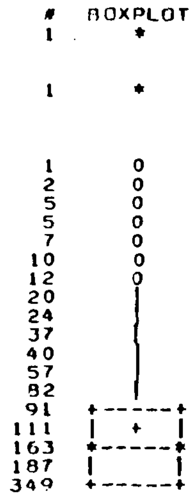
MOMENTS			
N	1205	SUM WGTS	1205
MEAN	16.3644	SUM	19719.1
STD DEV	16.7802	VARIANCE	281.574
SKEWNESS	1.5847	KURTOSIS	3.29492
USS	661707	CSS	339015
CV	102.541	STD MEAN	0.483396
T:MEAN=0	33.8531	PROB>|T|	0.0001
D:NORMAL	0.164872	PROB>D	<0.01

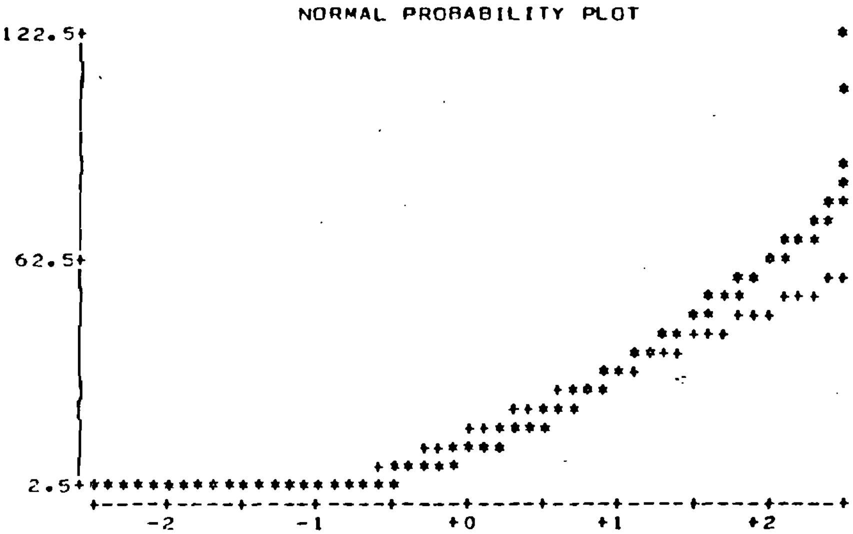
QUANTILES(DEF=4)			
100% MAX	122.14	99%	73.3581
75% Q3	24.74	95%	50.28
50% MED	11.12	90%	40.228
25% Q1	3.555	10%	0.295999
0% MIN	0.01	5%	0.05
		1%	0.01
RANGE	122.13		
Q3-Q1	21.185		
MODE	0.01		

EXTREMES	
LOWEST	HIGHEST
0.01	80.16
0.01	84.25
0.01	85.68
0.01	108.63
0.01	122.14

MISSING VALUE .
COUNT 622
% COUNT/NOBS 34.04







- Modeled concentrations at 800 m 290°
- When the 622 zero values are excluded the remaining values fit an exponential distribution
- 50% of the non-zero values are below 11.12 μg/m³
- Highest value is 122 μg/m³, second highest is 108.6 as reported.

ESE AIR QUALITY PROJECT--SUGAR MILL
DISTRIBUTIONAL PROPERTIES OF BACKGROUND DATA **BEST AVAILABLE COPY**
1978-80 14:23 MONDAY, JULY 13, 1981
PB19 BACKGROUND DATA
UNIVARIATE

VARIABLE=LOG_BACK LOG TRANSFORM BACKGROUND SUS. PART.

MOMENTS				QUANTILES(DEF=4)			
N	169	SUM WGTS	169	100% MAX	4.79579	99%	4.79579
MEAN	3.98112	SUM	672.81	75% Q3	4.23411	95%	4.49422
STD DEV	0.346605	VARIANCE	0.120135	50% MED	3.97029	90%	4.39445
SKEWNESS	-0.412566	KURTOSIS	0.482823	25% Q1	3.74943	10%	3.52636
USS	2698.72	CSS	20.1827	0% MIN	2.77259	5%	3.40064
CV	8.70622	STD MEAN	0.0266619			1%	2.92879
T:MEAN=0	149.319	PROB>:T:	0.0001	RANGE	2.0232		
D:NORMAL	0.0678787	PROB>D	0.055	Q3-Q1	0.484672		
				MODE	3.8712		

EXTREMES

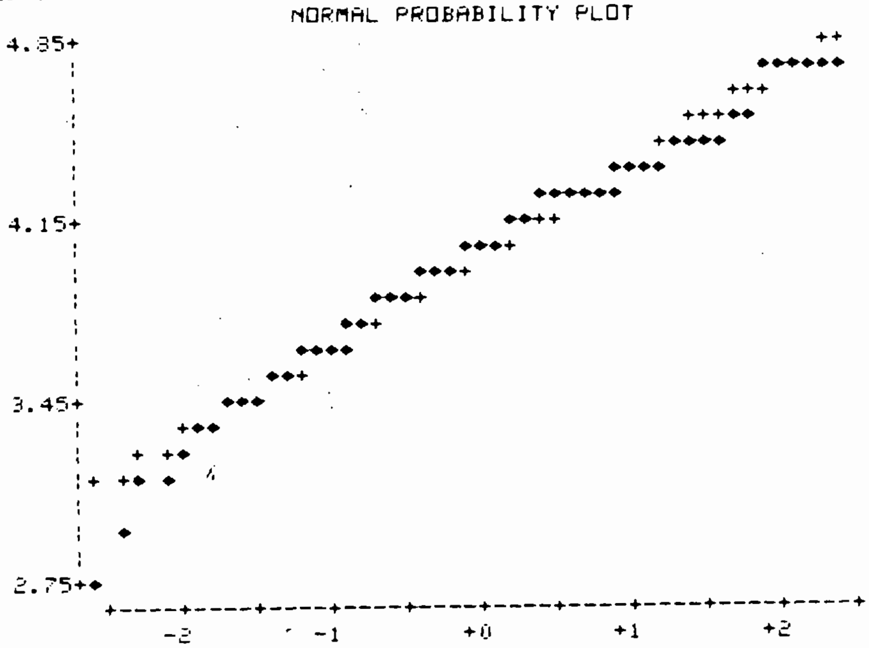
LOWEST	HIGHEST
2.77259	4.57471
2.99573	4.70048
3.13549	4.70048
3.17805	4.79579
3.21887	4.79579

```
STEM LEAF                          #            BOXPLOT
  48 00                            2               |
  47 00                            2               |
  46                                               |
  45 0267                          4               |
  44 2344789                       7               |
  43 000023446799                 12               |
  42 0000022333355555566669999    25            +-----+
  41 3333466777779                13            |     |
  40 33466888888899999            17            |     |
  39 11111113333333355577799      23            *--+--*
  38 111135777777777999           18            |     |
  37 11114446888                  11            +-----+
  36 11444466699                  11               |
  35 00000333688888               14               |
  34 33                            2               |
  33 337                           3               |
  32 2                             1               |
  31 48                            2               |
  30 0                             1               |
  29                                               0
  28
  27 7                             1               0
     ----+----+----+----+----
MULTIPLY STEM.LEAF BY 10**-01
```

PB-19 Log Domain
1978-80
(4)

ESE AIR QUALITY PROJECT--SUGAR MILL 4
DISTRIBUTIONAL PROPERTIES OF BACKGROUND DATA
1978-80 14:23 MONDAY, JULY 13, 1981
PB19 BACKGROUND DATA
UNIVARIATE

VARIABLE=LOG_BACK LOG TRANSFORM BACKGROUND SUS. PART.
NORMAL PROBABILITY PLOT



TCP OUTPUT CHARGE: $ .08

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DISTRIBUTIONAL PROPERTIES OF BACKGROUND DATA
1978-80 14:23 MONDAY, JULY 13, 1981
PB19 BACKGROUND DATA
UNIVARIATE

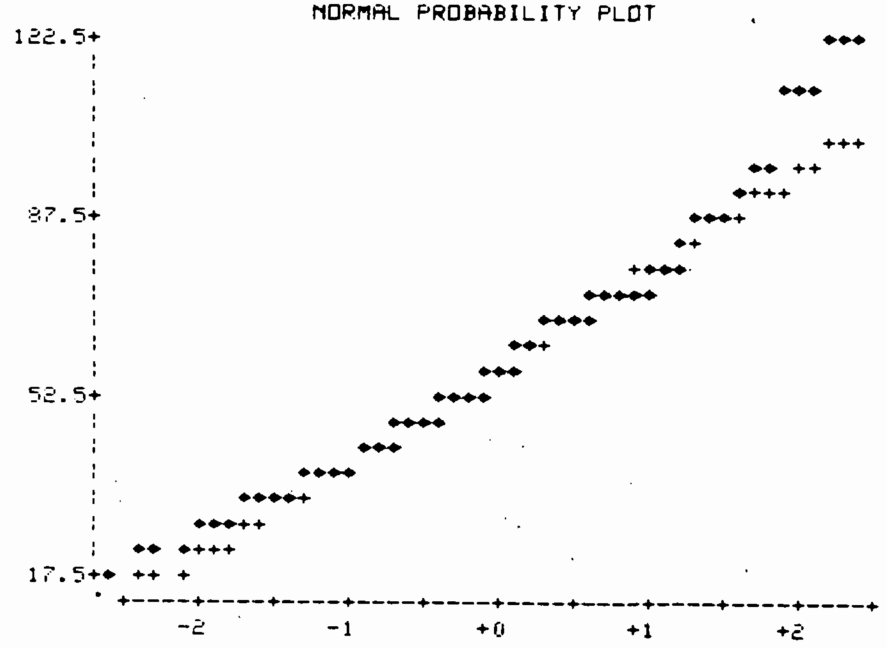
```
ARIABLE=BACKGRND       BACKGROUND SUS. PART.  (UG/M3)
                MOMENTS                                    QUANTILES(DEF=4)
              169  SUM WGTS          169   100% MAX       121     99%        121
EAN       56.7278  SUM              9587    75% Q3         69     95%       89.5
TD DEV    18.9987  VARIANCE      360.949    50% MED        53     90%         81
KEWNESS   0.68127  KURTOSIS     0.850495    25% Q1       42.5     10%         34
SS         604489  CSS           60639.5     0% MIN        16      5%         30
V         33.4909  STD MEAN      1.46144                           1%       18.8
:MEAN=0   38.8165  PROB>|T|       0.0001    RANGE         105
:NORMAL 0.0859325  PROB>D          <0.01    Q3-Q1        26.5
                                            MODE           48
                                  EXTREMES
                             LOWEST         HIGHEST
                                 16              97
                                 20             110
                                 23             110
                                 24             121
                                 25             121
            STEM LEAF                          #              BOXPLOT
              12 11                            2                 0
              11
              11 00                            2                 0
              10
              10
               9 67                            2                 |
               9 02                            2                 |
               8 55789                         5                 |
               8 1134                          4                 |
               7 567789                        6                 |
               7 000000111133334444           18                 |
               6 55555677777889999            17              +-----+
               6 000002222344                 12              |     |
               5 667889999999                 12              |  +  |
               5 00000000111111122233344      23              *-----*
               4 555567888888888999           18              |     |
               4 0011112223444                13              +-----+
               3 566666778888999              15                 |
               3 1133333444                   10                 |
               2 5889                          4                 |
               2 034                           3                 |
               1 6                             1                 |
                 ----+----+----+----+---
```

③ PB-19 REAL DOMAIN 1978-80

DISTRIBUTIONAL PROPERTIES OF BACKGROUND DATA
1978-80 14:23 MONDAY, JULY 13, 1981
PB19 BACKGROUND DATA
UNIVARIATE

VARIABLE=BACKGRND BACKGROUND SUS. PART. (UG/M3)

NORMAL PROBABILITY PLOT



BEST AVAILABLE COPY

UNIVARIATE ② 1978-80 PB-16 LOG DOMAIN

VARIABLE=LOG_BACK   LOG TRANSFORM BACKGROUND SUS. PART.

MOMENTS

N	175	SUM WGTS	175
MEAN	3.44742	SUM	603.299
STD DEV	0.410649	VARIANCE	0.168797
SKEWNESS	0.229241	KURTOSIS	0.189925
USS	2109.19	CSS	29.3706
CV	11.9176	STD MEAN	0.0310573
T:MEAN=0	111.002	PROB>|T|	0.0001
D:NORMAL	0.0667754	PROB>D	0.055

QUANTILES(DEF=4)

100% MAX	4.91265	99%	4.57312
75% Q3	3.73767	95%	4.11733
50% MED	3.43399	90%	3.95124
25% Q1	3.17805	10%	2.94444
0% MIN	2.39789	5%	2.77259
		1%	2.58118
RANGE	2.51476		
Q3-Q1	0.559616		
MODE	3.21887		

EXTREMES

LOWEST	HIGHEST
2.39789	4.21951
2.63906	4.33073
2.63906	4.34381
2.63906	4.46591
2.70805	4.91265

```
STEM LEAF                      #
  49 1                         1
  48
  47
  46
  45
  44 7                         1
  43 34                        2
  42 02                        2
  41 1146                      4
  40 1339                      4
  39 11355579                  8
  38 11113377999              11
  37 111444466688888          15
  36 11144444444466699999     20
  35 00333666688388           14
  34 00333333377              11
  33 00000000033337777        17
  32 2222222226666666         16
  31 44444888888              11
  30 00000444444499999        17
  29 444444                    6
  28 33999                     5
  27 111777                    6
  26 444                       3
  25
  24 0                         1
  23
     ----+----+----+----+
  MULTIPLY STEM.LEAF BY 10**-01
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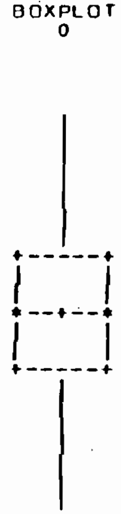
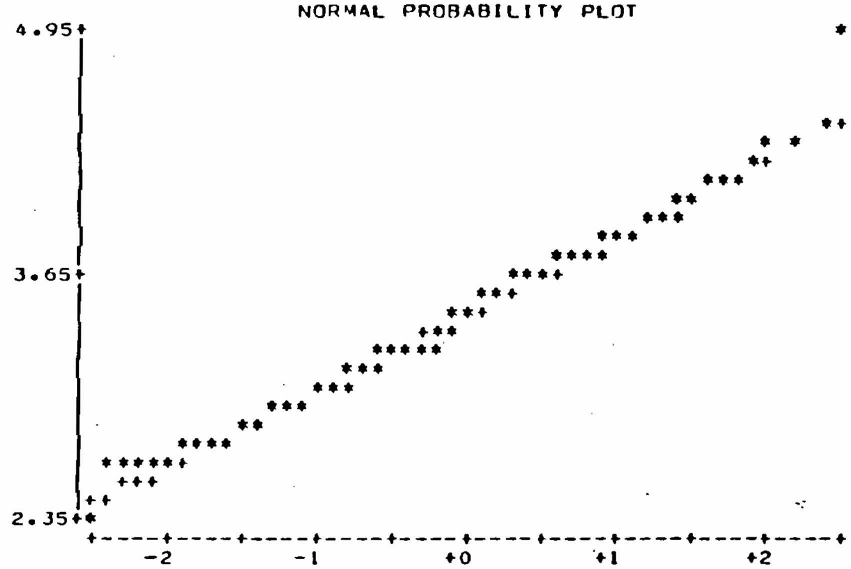
BOXPLOT



NORMAL PROBABILITY PLOT



(1) 1978-80 PB-16 REAL DOMAIN

UNIVARIATE

```
VARIABLE=BACKGRND        BACKGROUND SUS. PART. (UG/M3)

                MOMENTS                                            QUANTILES(DEF=4)                                  EXTREMES

N               175      SUM WGTS        175         100% MAX   136       99%    98.7595              LOWEST     HIGHEST
MEAN        34.2686      SUM            5997          75% Q3     42       95%       61.4                  11          68
STD DEV     15.6921      VARIANCE    246.244          50% MED    31       90%         52                  14          76
SKEWNESS    2.17195      KURTOSIS    9.84367          25% Q1     24       10%         19                  14          77
USS          248355      CSS         42846.4           0% MIN    11        5%         16                  14          87
CV          45.7917      STD MEAN    1.18621                               1%      13.28                  15         136
T:MEAN=0     28.889      PROB>|T|     0.0001         RANGE      125
D:NORMAL   0.102499      PROB>D        <0.01         Q3-Q1       18
                                                     MODE        25

   STEM LEAF                                     #     BOXPLOT
     13 6                                        1        *
     13
     12
     12
     11
     11
     10
     10
      9
      9
      8 7                                        1        0
      8
      7 67                                       2        0
      7
      6 78                                       2        |
      6 01134                                    5        |
      5 566                                      3        |
      5 00122234                                 8        |
      4 55556688999                             11        |
      4 00000111222233344444                    20    +-------+
      3 555566666777888888888999                24    |       |
      3 0011111112233444                        16    *---+---*
      2 555555555666666677777777888889999       33    |       |
      2 0000011111112222233333444444            28    +-------+
      1 55566677888999999                       17        |
      1 1444                                     4        |
        ----+----+----+----+----+----+---
        MULTIPLY STEM.LEAF BY 10**+01
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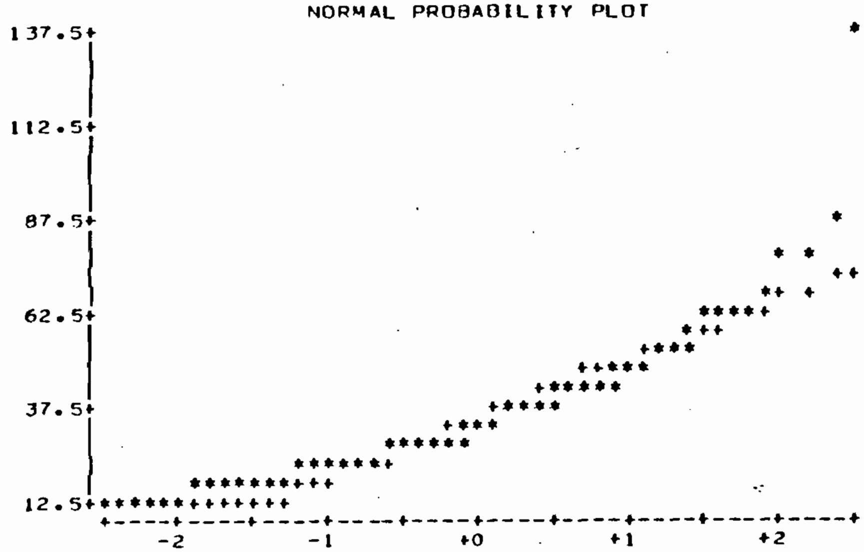
NORMAL PROBABILITY PLOT



1 1978-80 PB-16 REAL DOMAIN

UNIVARIATE

VARIABLE=BACKGRND BACKGROUND SUS. PART. (UG/M3)

MOMENTS

N	175	SUM WGTS	175
MEAN	34.2686	SUM	5997
STD DEV	15.6921	VARIANCE	246.244
SKEWNESS	2.17195	KURTOSIS	9.84367
USS	248355	CSS	42846.4
CV	45.7917	STD MEAN	1.18621
T:MEAN=0	28.889	PROB>|T|	0.0001
D:NORMAL	0.102499	PROB>D	<0.01

QUANTILES(DEF=4)

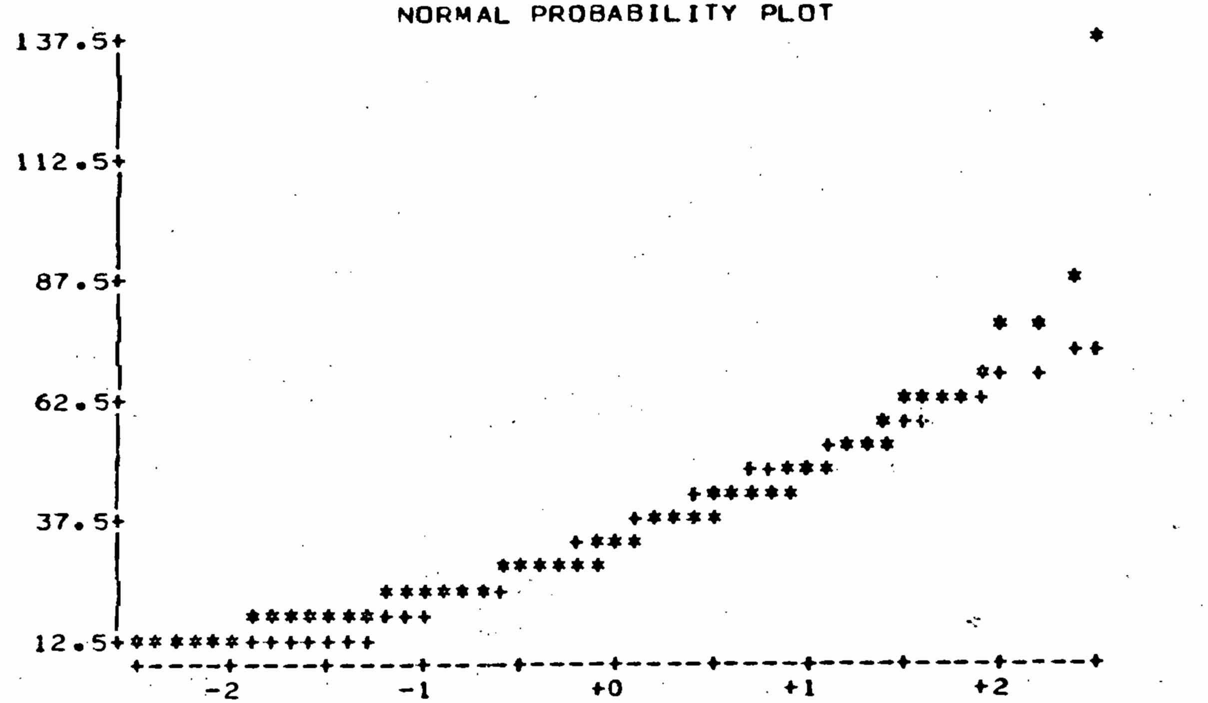
100% MAX	136	99%	98.7595
75% Q3	42	95%	61.4
50% MED	31	90%	52
25% Q1	24	10%	19
0% MIN	11	5%	16
		1%	13.28
RANGE	125		
Q3-Q1	18		
MODE	25		

EXTREMES

LOWEST	HIGHEST
11	68
14	76
14	77
14	87
15	136

```
STEM LEAF                                    #     BOXPLOT
 13 6                                        1        *
 13
 12
 12
 11
 11
 10
 10
  9
  9
  8 7                                        1        0
  8
  7 67                                       2        0
  7
  6 78                                       2        |
  6 01134                                    5        |
  5 566                                      3        |
  5 00122234                                 8        |
  4 55556688999                             11        |
  4 00000111222233344444                    20     +-----+
  3 555566667778888888888999                24     |     |
  3 0011111112233444                        16     *--+--*
  2 555555555666666677777777788889999       33     |     |
  2 0000011111112222233333444444            28     +-----+
  1 55566677888999999                       17        |
  1 1444                                     4        |
    ----+----+----+----+----+----+---
  MULTIPLY STEM.LEAF BY 10**+01
```

NORMAL PROBABILITY PLOT



② 1978-80 PB-16 LOG DOMAIN

UNIVARIATE

VARIABLE=LOG_BACK LOG TRANSFORM BACKGROUND SUS. PART.

MOMENTS

N	175	SUM WGTS	175
MEAN	3.44742	SUM	603.299
STD DEV	0.410849	VARIANCE	0.168797
SKEWNESS	0.229241	KURTOSIS	0.189925
USS	2109.19	CSS	29.3706
CV	11.9176	STD MEAN	0.0310573
T:MEAN=0	111.002	PROB>|T|	0.0001
D:NORMAL	0.0667754	PROB>D	0.055

QUANTILES(DEF=4)

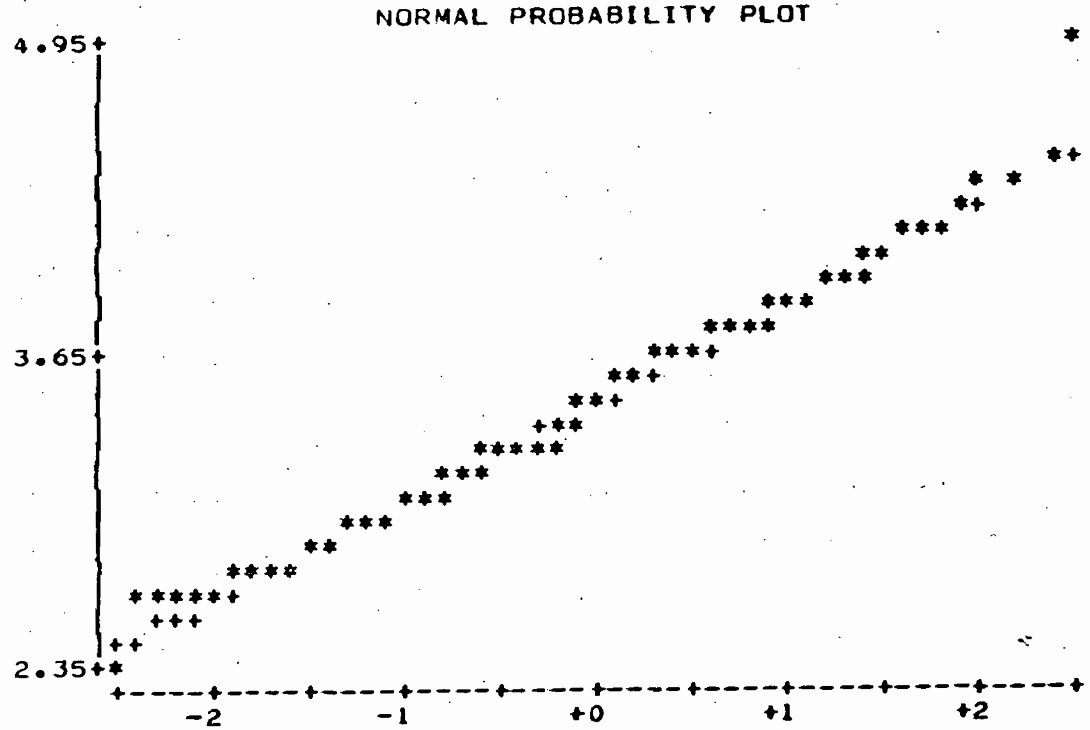
100% MAX	4.91265	99%	4.57312
75% Q3	3.73767	95%	4.11733
50% MED	3.43399	90%	3.95124
25% Q1	3.17805	10%	2.94444
0% MIN	2.39789	5%	2.77259
		1%	2.58118
RANGE	2.51476		
Q3-Q1	0.559616		
MODE	3.21887		

EXTREMES

LOWEST	HIGHEST
2.39789	4.21951
2.63906	4.33073
2.63906	4.34381
2.63906	4.46591
2.70805	4.91265

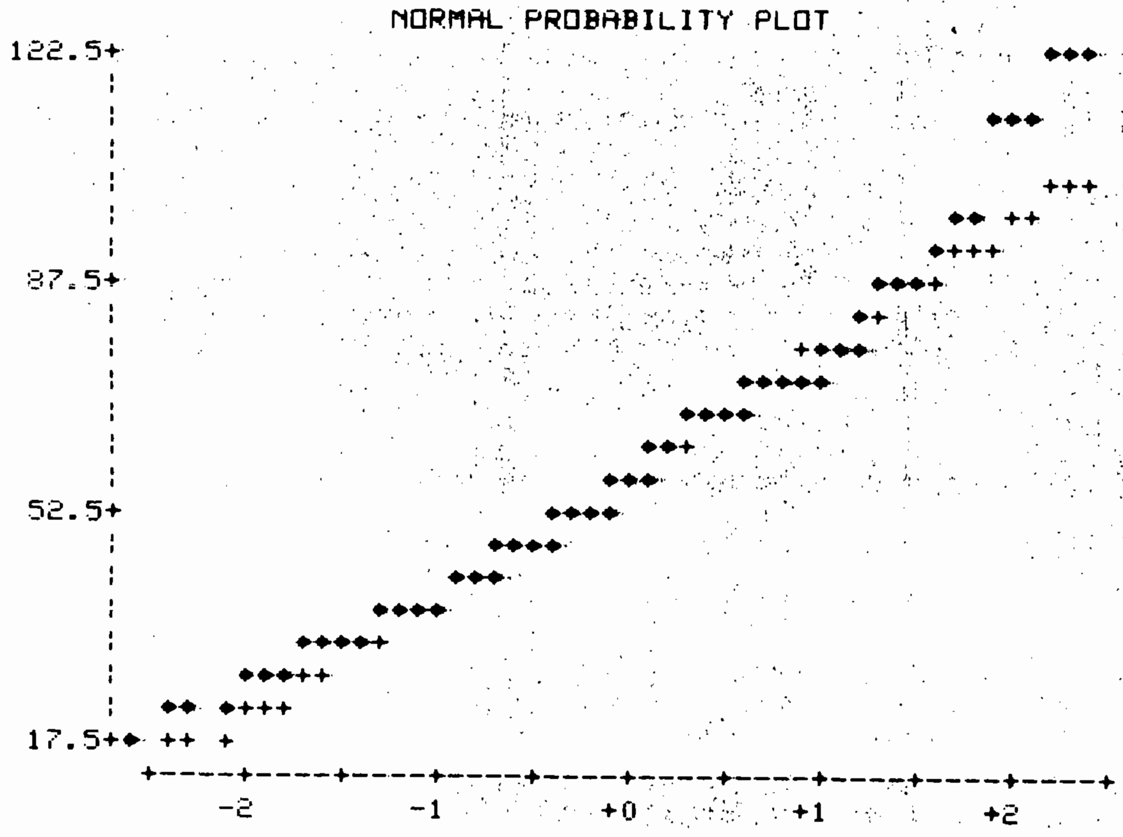
```
STEM LEAF                          #     BOXPLOT
  49 1                             1        0
  48
  47
  46
  45
  44 7                             1
  43 34                            2
  42 02                            2
  41 1146                          4
  40 1339                          4
  39 11355579                      8
  38 11113377999                  11
  37 111444466688888              15
  36 11144444444466699999         20
  35 00333666688888               14
  34 00333333377                  11
  33 00000000033337777            17
  32 2222222226666666             16
  31 44444888888                  11
  30 00000444444499999            17
  29 444444                        6
  28 33999                         5
  27 111777                        6
  26 444                           3
  25
  24 0                             1
  23
     ----+----+----+----+
MULTIPLY STEM.LEAF BY 10**-01
```

NORMAL PROBABILITY PLOT



PB-19 REAL DOMAIN 1978-80 (3)

```
•• CLASS Q •••------------------------------------------------------------------
                     ESE AIR QUALITY PROJECT--SUGAR MILL                          1
              DISTRIBUTIONAL PROPERTIES OF BACKGROUND DATA
                                 1978-80              14:23 MONDAY, JULY 13, 1981
                           PB19 BACKGROUND DATA
                                UNIVARIATE
'ARIABLE=BACKGRND       BACKGROUND SUS. PART. (UG/M3)
            MOMENTS                                      QUANTILES(DEF=4)
!                169   SUM WGTS          169   100% MAX       121     99%        121
1EAN         56.7278   SUM              9587    75% Q3         69     95%       89.5
STD DEV      18.9987   VARIANCE      360.949    50% MED        53     90%         81
KEWNESS      0.68127   KURTOSIS     0.850495    25% Q1       42.5     10%         34
JSS           604489   CSS           60639.5     0% MIN        16      5%         30
:V           33.4909   STD MEAN      1.46144                           1%       18.8
T:MEAN=0     38.8165   PROB>|T|       0.0001    RANGE         105
D:NORMAL   0.0859325   PROB>D          <0.01    Q3-Q1        26.5
                                                MODE           48
                                 EXTREMES
                           LOWEST          HIGHEST
                               16               97
                               20              110
                               23              110
                               24              121
                               25              121
            STEM LEAF                                  #              BOXPLOT
              12 11                                    2                 0
              11
              11 00                                    2                 0
              10
              10
               9 67                                    2                 |
               9 02                                    2                 |
               8 55789                                 5                 |
               8 1134                                  4                 |
               7 567789                                6                 |
               7 000000111133334444                   18                 |
               6 55555677777889999                    17              +-----+
               6 000002222344                         12              |     |
               5 667889999999                         12              |  +  |
               5 00000001111111122233344              23              *-----*
               4 555567888888888999                   18              |     |
               4 0011112223444                        13              +-----+
               3 566666778888999                      15                 |
               3 1133333444                           10                 |
               2 5889                                  4                 |
               2 034                                   3                 |
               1 6                                     1                 |
                 ----+----+----+----+---
                     ESE AIR QUALITY PROJECT--SUGAR MILL                          2
              DISTRIBUTIONAL PROPERTIES OF BACKGROUND DATA
                                 1978-80              14:23 MONDAY, JULY 13, 1981
                           PB19 BACKGROUND DATA
                                UNIVARIATE
VARIABLE=BACKGRND       BACKGROUND SUS. PART. (UG/M3)
                         NORMAL PROBABILITY PLOT
```



ESE AIR QUALITY PROJECT--SUGAR MILL **BEST AVAILABLE COPY**
DISTRIBUTIONAL PROPERTIES OF BACKGROUND DATA
1978-80 14:23 MONDAY, JULY 13, 1981
PB19 BACKGROUND DATA
UNIVARIATE

VARIABLE=LOG_BACK LOG TRANSFORM BACKGROUND SUS. PART.

MOMENTS				QUANTILES(DEF=4)			
N	169	SUM WGTS	169	100% MAX	4.79579	99%	4.79579
MEAN	3.98112	SUM	672.81	75% Q3	4.23411	95%	4.49422
STD DEV	0.346605	VARIANCE	0.120135	50% MED	3.97029	90%	4.39445
SKEWNESS	-0.412566	KURTOSIS	0.482823	25% Q1	3.74943	10%	3.52636
USS	2698.72	CSS	20.1827	0% MIN	2.77259	5%	3.40064
CV	8.70622	STD MEAN	0.0266619			1%	2.92879
T:MEAN=0	149.319	PROB>|T|	0.0001	RANGE	2.0232		
D:NORMAL	0.0678787	PROB>D	0.055	Q3-Q1	0.484672		
				MODE	3.8712		

EXTREMES

LOWEST	HIGHEST
2.77259	4.57471
2.99573	4.70048
3.13549	4.70048
3.17805	4.79579
3.21887	4.79579

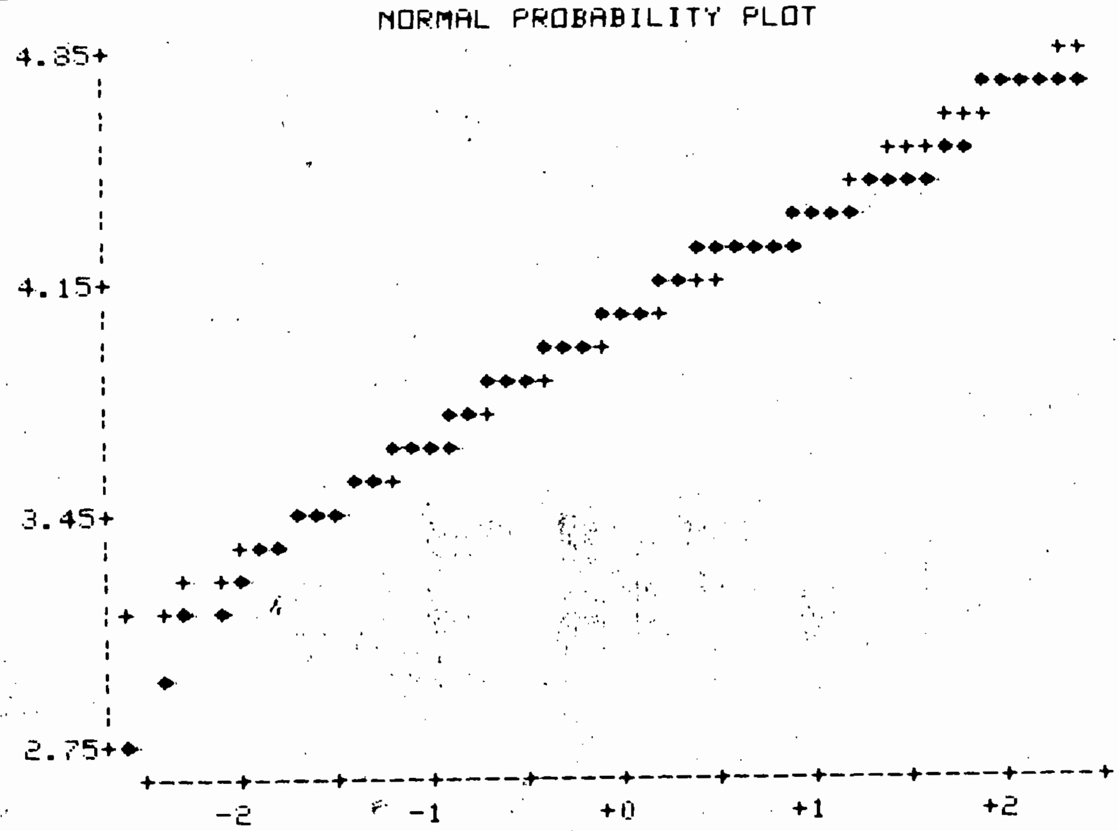
```
STEM LEAF                                #        BOXPLOT
  48 00                                  2           |
  47 00                                  2           |
  46                                                 |
  45 0267                                4           |
  44 2344789                             7           |
  43 000023446799                       12           |
  42 0000022333355555566669999          25       +-----+
  41 3333466777779                      13       |     |
  40 33466888888899999                  17       |     |
  39 11111113333333355577799            23       *--+--*
  38 111135777777777999                 18       |     |
  37 11114446888                        11       +-----+
  36 11444466699                        11          |
  35 00000333688888                     14          |
  34 33                                  2          |
  33 337                                 3          |
  32 2                                   1          |
  31 48                                  2          |
  30 0                                   1          |
  29                                                0
  28
  27 7                                   1          0
     ----+----+----+----+----+
MULTIPLY STEM.LEAF BY 10**-01
```

PB-19 LOG DOMAIN 1978-80

(4)

ESE AIR QUALITY PROJECT--SUGAR MILL 4
DISTRIBUTIONAL PROPERTIES OF BACKGROUND DATA
1978-80 14:23 MONDAY, JULY 13, 1981
PB19 BACKGROUND DATA
UNIVARIATE

VARIABLE=LOG_BACK LOG TRANSFORM BACKGROUND SUS. PART.
NORMAL PROBABILITY PLOT



TCP OUTPUT CHARGE: $ .08

(5) MODELED IMPACT SUMMARY

ESE AIR QUALITY PROJECT 18:41 MONDAY, JULY 6, 1981 3

DISTRIBUTIONAL CHARACTERISTICS OF PLANT ~~EMISSION~~ Concentration

UNIVARIATE

VARIABLE=PCS_LEVL POSITIVE ~~EMISSION~~ concentration VALUES

MOMENTS

N	1205	SUM WGTS	1205
MEAN	16.3644	SUM	19719.1
STD DEV	16.7802	VARIANCE	281.574
SKEWNESS	1.5847	KURTOSIS	3.29492
USS	661707	CSS	339015
CV	102.541	STD MEAN	0.483396
T:MEAN=0	33.8531	PROB>|T|	0.0001
D:NORMAL	0.164872	PROB>D	<0.01

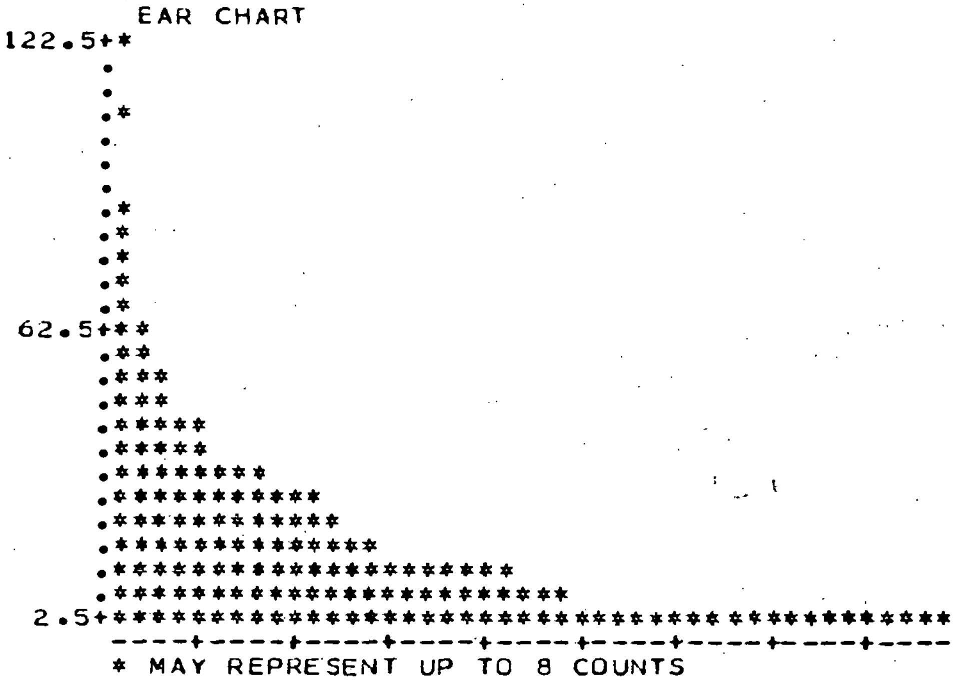
QUANTILES(DEF=4)

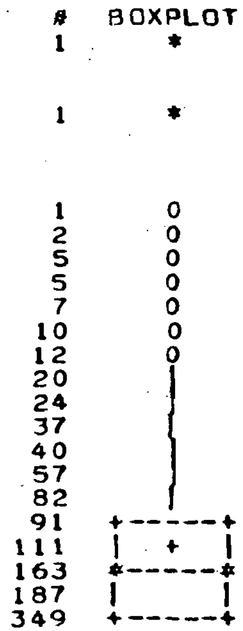
100% MAX	122.14	99%	73.3581
75% Q3	24.74	95%	50.28
50% MED	11.12	90%	40.228
25% Q1	3.555	10%	0.295999
0% MIN	0.01	5%	0.05
		1%	0.01
RANGE	122.13		
Q3-Q1	21.185		
MODE	0.01		

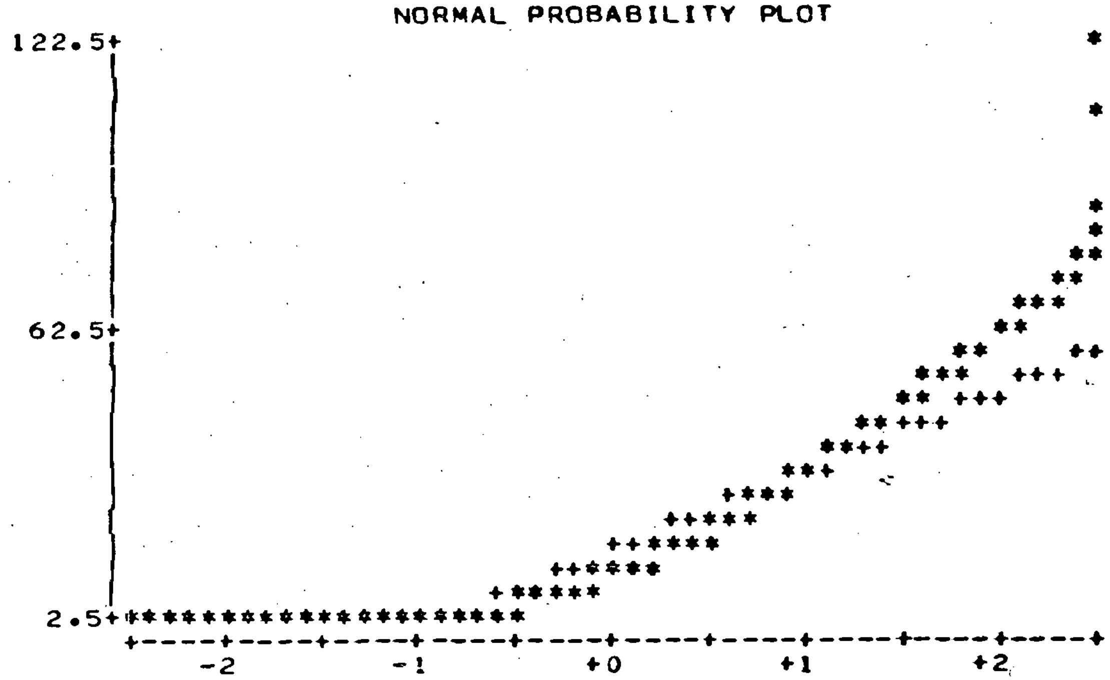
EXTREMES

LOWEST	HIGHEST
0.01	80.16
0.01	84.25
0.01	85.68
0.01	108.63
0.01	122.14

MISSING VALUE .
COUNT 622
% COUNT/NOBS 34.04







- Modeled concentrations at 800 m 290°
- When the 622 zero values are excluded the remaining values fit an exponential distribution
- 50% of the non-zero values are below 11.12 μg/m³
- Highest value is 122 μg/m³, second highest is 108.6 as reported.

ESE ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

P.O. BOX ESE
GAINESVILLE, FLORIDA 32602
904/372-3318

August 18, 1981
ESE NO. 80 190 100

AUG 1981
BUREAU
A Q M

Mr. Cleve Holladay
Bureau of Air Quality Management
Florida Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

RE: Sugar Cane Growers Cooperative AC-42476; PSD-FL-077

Dear Cleve:

As we agreed last week, I am sending you the printouts of the oil burning scenarios we discussed. Printout Number 1 shows that 542,000 pounds/hour steam can be produced by burning oil alone without violating the three hour Ambient Air Quality Standard.

Printout Number 2 shows that when boiler Number 8 is operated at maximum oil burning capacity, a 75 percent reduction in SO_2 emissions from Boilers 1 through 5 will maintain 24-hour Ambient Air Quality Standards.

Both of these combinations produce more than enough steam to meet demands during a shortage of bagasse or residue as described in the project summary and compliance plan.

Do not hesitate to call with any questions.

Sincerely,

M. H. Dybevick

Michael H. Dybevick
Associated Engineer
Air Modeling and Permitting

MHD/ctw

cc: Enrique Arias

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*** SCGC 2251 --SO2 THREE HOUR BURNING OIL AT 40% RATING ***

PRINTOUT #1

CALCULATE (CONCENTRATION=1,DEPOSITION=2)	ISW(1) = 1
RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)	ISW(2) = 3
DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)	ISW(3) = 1
TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)	ISW(4) = 0
CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)	ISW(5) = 0
LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)	ISW(6) = 1
COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION) WITH THE FOLLOWING TIME PERIODS:	
HOURLY (YES=1,NO=0)	ISW(7) = 0
2-HOUR (YES=1,NO=0)	ISW(8) = 0
3-HOUR (YES=1,NO=0)	ISW(9) = 1
4-HOUR (YES=1,NO=0)	ISW(10) = 0
6-HOUR (YES=1,NO=0)	ISW(11) = 0
8-HOUR (YES=1,NO=0)	ISW(12) = 0
12-HOUR (YES=1,NO=0)	ISW(13) = 0
24-HOUR (YES=1,NO=0)	ISW(14) = 0
PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)	ISW(15) = 0
PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE SPECIFIED BY ISW(7) THROUGH ISW(14):	
DAILY TABLES (YES=1,NO=0)	ISW(16) = 1
HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)	ISW(17) = 0
MAXIMUM 50 TABLES (YES=1,NO=0)	ISW(18) = 0
METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)	ISW(19) = 1
RURAL-URBAN OPTION (RURAL=0,URBAN MODE 1=1,URBAN MODE 2=2)	ISW(20) = 0
WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(21) = 1
VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(22) = 1
SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)	ISW(23) = 0
PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)	ISW(24) = 1
PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)	ISW(25) = 1
NUMBER OF INPUT SOURCES	NSOURC = 6
NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)	NGROUP = 0
TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)	IPERD = 5
NUMBER OF X (RANGE) GRID VALUES	NXPNTS = 10
NUMBER OF Y (THETA) GRID VALUES	NYPNTS = 10
NUMBER OF DISCRETE RECEPTORS	NXWYPT = 0
SOURCE EMISSION RATE UNITS CONVERSION FACTOR	TK =.10000E+07
ENTRAINMENT COEFFICIENT FOR UNSTABLE ATMOSPHERE	BETA1 =0.600
ENTRAINMENT COEFFICIENT FOR STABLE ATMOSPHERE	BETA2 =0.600
HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED	ZR = 7.00 METERS
LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA	IMET = 9
DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION	DECAY =0.000000E+00
SURFACE STATION NO.	ISS = 12844
YEAR OF SURFACE DATA	ISY = 70
UPPER AIR STATION NO.	IUS = 12839
YEAR OF UPPER AIR DATA	IUY = 70
ALLOCATED DATA STORAGE	LIMIT = 43500 WORDS
REQUIRED DATA STORAGE FOR THIS PROBLEM RUN	MIMIT = 1610 WORDS

1

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*** SCGC 2251 --SO2 THREE HOUR BURNING OIL AT 40% RATING ***

*** METEOROLOGICAL DAYS TO BE PROCESSED ***
(IF=1)

```
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000010 0000000000 0000000000
0000000000 000000
```

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
B	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
C	.20000E+00	.20000E+00	.20000E+00	.20000E+00	.20000E+00	.20000E+00
D	.25000E+00	.25000E+00	.25000E+00	.25000E+00	.25000E+00	.25000E+00
E	.30000E+00	.30000E+00	.30000E+00	.30000E+00	.30000E+00	.30000E+00
F	.30000E+00	.30000E+00	.30000E+00	.30000E+00	.30000E+00	.30000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

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*** SCGC 2251 --SO2 THREE HOUR BURNING OIL AT 40% RATING ***

SOURCE # 1---BOILERS #1 & #2 --- 2 STACKS EACH
SOURCE # 2---BOILER #3 --- 1 STACK
SOURCE # 3---BOILER #4 --- 1 STACK
SOURCE # 4---BOILER #5 --- 2 STACKS
SOURCE # 5---NEW BOILER #8
SOURCE # 6---BOILERS #6 & #7 --- BOTH INTO ONE STACK

*** 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)
1	0	0	0	32.600	0.	31.	0.0	24.40	344.0	6.30	1.40	0.00	0.00	0.00
2	0	0	0	13.600	0.	0.	0.0	24.40	344.0	4.10	1.60	0.00	0.00	0.00
3	0	0	0	32.600	0.	-16.	0.0	33.50	344.0	3.10	2.82	0.00	0.00	0.00
4	0	0	0	21.800	0.	-30.	0.0	24.40	344.0	8.50	1.40	0.00	0.00	0.00
5	0	0	0	32.600	-33.	-16.	0.0	47.20	344.0	2.70	3.05	0.00	0.00	0.00
6	0	0	0	51.000	-33.	10.	0.0	12.20	606.0	22.40	1.52	0.00	0.00	0.00

* Based on 1.8% Sulfur
See table A-1

\+ See table A-2

Boiler	Rated Steam Capacity (1000 lb/HR)	Modeled Production (1000 lb/HR)
#1 & #2	240	96
#3	100	40
#4	240	96
#5	160	64
#6 & #7	150	150
#8	240	96
TOTAL	1130	542

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DAILY: 329 – See table 2-5 (pg 2-13)
3-HR/PD 5
SGROUP# 1
YEAR 1973
*** SCGC 2251 -- SO2 THREE HOUR BURNING OIL AT 40% RATING ***

* DAILY 3-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER) *
* ENDING WITH HOUR 15 FOR DAY 329 *
* FROM ALL SOURCES *
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 1189.8 AND OCCURRED AT (-314.0, 412.0) *

Y-AXIS / (METERS) /	X-AXIS (METERS) -1014.0	-914.0	-814.0	-714.0	-614.0	-514.0	-414.0	-314.0	-214.0
1012.0 /	256.2	473.9	700.7	660.5	336.2	95.3	15.9	1.2	0.0
912.0 /	138.2	295.9	565.0	800.7	631.7	235.9	45.7	4.0	0.1
812.0 /	57.9	149.4	344.0	678.8	892.0	539.6	133.3	14.4	0.4
712.0 /	16.1	54.4	159.4	401.8	816.9	937.0	381.4	52.9	1.9
612.0 /	2.5	11.5	47.8	165.8	468.7	973.4	879.8	197.3	9.9
512.0 /	0.2	1.1	6.9	37.6	164.7	543.4	1125.6	658.4	55.4
412.0 /	0.0	0.0	0.3	3.0	24.3	149.9	616.1	1189.8	300.0
312.0 /	0.0	0.0	0.0	0.0	0.8	10.8	113.0	645.4	942.5
212.0 /	0.0	0.0	0.0	0.0	0.0	0.1	2.1	52.2	488.3
112.0 /	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5

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*** SCGC 2254 --SO2 BOILER #8 AT MAX OIL, OTHERS REDUCED CAPACITY ***

Printout #2

CALCULATE (CONCENTRATION=1,DEPOSITION=2)	ISW(1) =	1
RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)	ISW(2) =	3
DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)	ISW(3) =	1
TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)	ISW(4) =	0
CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)	ISW(5) =	0
LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)	ISW(6) =	1
COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION) WITH THE FOLLOWING TIME PERIODS:		
HOURLY (YES=1,NO=0)	ISW(7) =	0
2-HOUR (YES=1,NO=0)	ISW(8) =	0
3-HOUR (YES=1,NO=0)	ISW(9) =	0
4-HOUR (YES=1,NO=0)	ISW(10) =	0
6-HOUR (YES=1,NO=0)	ISW(11) =	0
8-HOUR (YES=1,NO=0)	ISW(12) =	0
12-HOUR (YES=1,NO=0)	ISW(13) =	0
24-HOUR (YES=1,NO=0)	ISW(14) =	1
PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)	ISW(15) =	0
PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE SPECIFIED BY ISW(7) THROUGH ISW(14):		
DAILY TABLES (YES=1,NO=0)	ISW(16) =	1
HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)	ISW(17) =	0
MAXIMUM 50 TABLES (YES=1,NO=0)	ISW(18) =	0
METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)	ISW(19) =	1
RURAL-URBAN OPTION (RURAL=0,URBAN MODE 1=1,URBAN MODE 2=2)	ISW(20) =	0
WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(21) =	1
VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(22) =	1
SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)	ISW(23) =	0
PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)	ISW(24) =	1
PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)	ISW(25) =	1
NUMBER OF INPUT SOURCES	NSOURC =	6
NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)	NGROUP =	0
TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)	IPERD =	0
NUMBER OF X (RANGE) GRID VALUES	NXPNTS =	10
NUMBER OF Y (THETA) GRID VALUES	NYPNTS =	10
NUMBER OF DISCRETE RECEPTORS	NXWYPT =	0
SOURCE EMISSION RATE UNITS CONVERSION FACTOR	TK =	.10000E+07
ENTRAINMENT COEFFICIENT FOR UNSTABLE ATMOSPHERE	BETA1 =	0.600
ENTRAINMENT COEFFICIENT FOR STABLE ATMOSPHERE	BETA2 =	0.600
HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED ZR = 7.00 METERS		
LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA	IMET =	9
DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION DECAY =0.000000E+00		
SURFACE STATION NO.	ISS =	12844
YEAR OF SURFACE DATA	ISY =	70
UPPER AIR STATION NO.	IUS =	12839
YEAR OF UPPER AIR DATA	IUY =	70
ALLOCATED DATA STORAGE	LIMIT =	43500 WORDS
REQUIRED DATA STORAGE FOR THIS PROBLEM RUN	MIMIT =	1610 WORDS

BEST AVAILABLE COPY

*** SCGC 2254 --SO2 BOILER #8 AT MAX OIL, OTHERS REDUCED CAPACITY ***

*** METEOROLOGICAL DAYS TO BE PROCESSED ***
(IF=1)

```
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000000 0000000000 0000000000 0000000000
0000000000 0000000010 0000000000 0000000000 0000000000
0000000000 000000
```

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
B	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
C	.20000E+00	.20000E+00	.20000E+00	.20000E+00	.20000E+00	.20000E+00
D	.25000E+00	.25000E+00	.25000E+00	.25000E+00	.25000E+00	.25000E+00
E	.30000E+00	.30000E+00	.30000E+00	.30000E+00	.30000E+00	.30000E+00
F	.30000E+00	.30000E+00	.30000E+00	.30000E+00	.30000E+00	.30000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

6

*** SCGC 2254 --SO2 BOILER #8 AT MAX OIL, OTHERS REDUCED CAPACITY ***

SOURCE # 1---BOILERS #1 & #2 -- 2 STACKS EACH
SOURCE # 2---BOILER #3 -- 1 STACK
SOURCE # 3---BOILER #4 -- 1 STACK
SOURCE # 4---BOILER #5 -- 2 STACKS
SOURCE # 5---NEW BOILER,#8
SOURCE # 6---BOILERS #6 & #7 -- BOTH INTO ONE STACK

*** 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)
1	0	0	0	18.150	0.	31.	0.0	24.40	344.0	11.40	1.40	0.00	0.00	0.00
2	0	0	0	3.300	0.	0.	0.0	24.40	344.0	15.60	1.60	0.00	0.00	0.00
3	0	0	0	18.150	0.	-16.	0.0	33.50	344.0	11.20	2.82	0.00	0.00	0.00
4	0	0	0	12.150	0.	-30.	0.0	24.40	344.0	15.20	1.40	0.00	0.00	0.00
5	0	0	0	67.900	-33.	-16.	0.0	47.20	344.0	5.60	3.05	0.00	0.00	0.00
6	0	0	0	51.000	-33.	10.	0.0	12.20	606.0	22.40	1.52	0.00	0.00	0.00

DAILY: 319
24-HR/PD 1
SGROUP# 1
YEAR 1971
*** SCGC-2254 --SO2 BOILER #8 AT MAX OIL, OTHERS REDUCED CAPACITY ***

* DAILY 24-HOUR AVERAGE CONCENTRATION (MICROGRAMS/CUBIC METER) *
* ENDING WITH HOUR 24 FOR DAY 319 *

* FROM ALL SOURCES *
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 233.5 AND OCCURRED AT (-1185.0, -274.0) *

Y-AXIS / (METERS) /	X-AXIS (METERS) -1485.0	-1385.0	-1285.0	-1185.0	-1085.0	-985.0	-885.0	-785.0	-685.0
226.0 /	5.3	4.0	2.9	1.9	1.1	0.6	0.3	0.1	0.0
126.0 /	26.5	24.4	21.9	19.0	16.0	12.7	9.4	6.4	3.9
26.0 /	88.8	69.8	70.4	70.4	69.6	67.0	62.2	56.1	49.0
-74.0 /	111.7	117.3	123.0	128.7	134.1	137.6	137.2	134.2	128.3
-174.0 /	146.8	157.8	170.2	183.9	198.5	211.0	214.2	204.6	175.4
-274.0 /	195.7	211.3	224.9	233.5	232.6	217.2	181.4	135.2	90.6
-374.0 /	211.9	209.6	198.9	179.3	152.6	123.1	93.8	68.2	46.5
-474.0 /	160.2	143.1	123.7	104.2	86.2	69.8	54.6	39.3	21.5
-574.0 /	102.0	88.8	76.4	64.8	54.0	43.7	31.7	16.1	3.9
-674.0 /	67.4	58.9	50.8	43.3	35.1	24.2	11.3	2.7	0.2

8

PSD-FL-077

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

November 20, 1981

Mr. Kent Williams
Air Facilities Branch
US EPA Region IV
345 Courtland Street
Atlanta, Georgia 30365

Re: Sugar Cane Growers Cooperative, Belle Glade, Florida: PSD-FL-077

Dear Mr. Williams:

You comments dated October 26, 1981 on the Preliminary Determination for the Sugar Cane Growers Cooperative proposed construction were received on October 29, 1981. The response to the comments are as follows:

Comment 1

The derating of boilers 6 and 7 must be a physical derating, not through permit limitations only. Copies of the revised permits should be attached to the State's determination.

Response

We agree that physical derating of boilers 6 and 7 would be desirable to control heat input. We feel that the combination of metering fuel oil input to the boilers and fuel analysis as addressed in the permit is a much more practical way to control maximum heat input. Revision of permits for boilers 1 through 7 must be completed prior to issuance of an operating permit for boiler 8.

Comment 2

GEP stack height calculations should be submitted not only for the new stack applied for, but also for boiler No. 4.

Response

The stack for boiler No. 4 falls within the area of influence of a building with a height of 102 feet and a width of more than 102 feet. Thus, application of the "2.5 times" rule results in a GEP stack height of 255 feet.

Comment 3

40% SO_2 removal is claimed for the TSP scrubbers. Verification of this should be submitted in the form of test reports, manufacturer's guarantees, etc.

Response

The 40% SO_2 removal claimed by the firm is a total system loss, not only TSP scrubbers. The firm must prove their claim by performance tests. The requirement of SO_2 emission tests was addressed in Specific Condition #6 of the permit.

Comment 4

The state should expand on the "design limitation" of boiler No. 8 limiting the heat input from oil firing to less than 250 MMBTU/hr. The explanation should describe the physical derating of the boiler during oil firing.

Response

We believe that metering fuel oil input to boiler No. 8 with fuel oil analysis is one of the best ways to control the maximum heat input. It would be hard to limit total heat input just by using physical derating without fuel analysis

Comment 5

The averaging out of the sulfur content of the fuel oil (decreasing the % on some boilers while increasing on others) may constitute a "bubble application". Revised permits containing the reduced sulfur limitations should be attached to the determination.

Response

We have revised Specific Condition No. 3 on the Final Determination which allows the firm to purchase different sulfur content fuel oils to blend at the site; therefore, it becomes unnecessary to revise operating permits for existing boilers. Daily oil consumption has been limited to provide a daily SO_2 emissions cap of 14.0 tons.

Comment 6

The banked VOC emissions from Palm Beach County offered as offsets for the modification increase should be recorded officially in some form in the determination in order to maintain accurate tracking of such banked emissions.

Response

All the offsets of VOC emissions for the modifications increases have been recorded as required by Chapter 17-2.17 (5) F.A.C..

Comments 7 and 8

24-Hour TSP background data should be directly obtainable from the monitored annual TSP data, thereby negating the need to calculate such a value. The table reflecting the ambient air quality impacts shows the 24-hour TSP value to be <150 ug/m^3. This appears to us to mean that the value is extremely close to violating the secondary standard. The calculated 24-hour TSP background value should be shown, along with impacts from the proposed modification and nearby sources.

Response

SCGC's PSD application was declared complete by FDER before June 8, 1981. Therefore, the 1978 PSD regulations concerning ambient data requirements are applicable. In addition, the guidelines which implemented those regulations (i.e., Ambient Monitoring Guidelines for Prevention of Significant Deterioration, EPA-450/2-78-019, May 1978; Guidelines on Air Quality Models, EPA-450-12-78-027, April 1978; and Guidelines for Air Quality Maintenance Planning and Analysis Volume 10 (Revised): Procedures for Evaluating Air Quality Impact of New Stationary Sources, EPA-450/4-77-001) would be applicable to any ambient data submitted with SCGC's application. These documents recommend using data from regional monitoring stations to assess preconstruction air quality when it is not possible to determine uninfluenced levels from monitors located near the subject source.

When the existing emissions from SCGC's mill were modeled by their consultant, violations of the 24-hour TSP secondary standard were predicted. As part of the proposed modification, additional control measures were needed to reduce plantwide TSP emissions to levels necessary to attain the secondary standard. In determining these additional measures, SCGC's consultant used a design 24-hour TSP background value of 40 ug/m^3 which when added to the modeled impact of the SCGC mill with additional controls and other nearby sources would result in a second high 24-hour TSP concentration of 149 ug/m^3.

This 40 ug/m^3 background value was based upon the average 84th percentile concentration derived from monitoring data gathered at three regional stations. Only one of these three stations, PB-16 operated by the Palm Beach County Health Department (PBCHD), is an FDER and EPA approved monitoring station. The other two are operated by the Sugar Cane League (SCL).

We had no reason to believe that the data gathered at the two SCL stations were erroneous; however, the data had not been quality assured. Furthermore, we felt that PB-16 was not suitable to be used by itself because it is located too far away and the data from this monitor would not accurately reflect the impact of cane field burning on the air quality in the region surrounding the SCGC mill. Therefore we asked for additional assurances that the 24-hour secondary standard would not be violated. The only other FDER and EPA approved TSP monitor located near the SCGC mill is PB-19. However, this monitor, which is located 5 kilometers to the southwest of the mill, is impacted by emissions from the mill. No adequate means of subtracting these impacts on the measured concentrations at PB-19 exists. Since neither PB-16 nor PB-19 is suitable for use by itself in determining a 24-hour TSP background value, we have accepted, as additional assurances a statistical analysis by SCGC's consultant which demonstrates that the probability is reasonably low that the combined impact of modeled PM emissions from the SCGC mill and the existing air quality as measured at the two monitors will result in a violation of the 24-hour secondary standard.

Comment 9

Even though a proposed increment expansion is expected, a comparison of the existing values to the proposed consumptions for SO_2 and TSP should be presented.

Response

The proposed modification would result in an improvement in air quality at all points and for all averaging times over that predicted for the existing plant configuration with actual emission rates. This means that regardless of increment consuming activity by any surrounding source, the net impact of this project on any increment standard would be negative. Maximum existing, modeled 24-hour TSP and 24-hour SO_2 ground level concentrations exceed Florida ambient air quality standards (FAAQS). Therefore, in order for this modification to be approvable, the 24-hour TSP and SO_2 FAAQS become limiting factors and increment is not expanded in the sense that any increment is made available for future growth.

Comment 10

Impacts from nearby sources should be included in the modeling analysis unless they are less than 1 ug/m^3.

Response

All significant TSP and SO_2 sources upwind of the directions of maximum SCGC impacts and within 50 km of the mill are accounted for in the modeling. Under meteorological conditions aligning the surrounding sources with SCGC, none of these facilities contributes more than 2 ug/m^3 to the TSP or SO_2 concentrations in the area of impact of the proposed SCGC boiler; these contributions are included in all reported impact values. No violations of any FAAQS or NAAQS are predicted to occur.

Comment 11

Background levels for SO_2 should be assigned in addition to the modeled values for conservativeness.

Response

FDER has customarily assumed a background value of 0 ug/m^3 for SO_2 in those areas of the state where space heating requirements are low and the easterly subtropical flow prevails. However, a conservative backgound SO_2 concentration attributable to non-specified sources can be estimated from current monitoring sites in the surrounding region. The annual average from these sites may be used as the background concentration for all averaging times, since the distances from the non-specified sources are greater than 50 kilometers. The monitor locations and annual concentrations are listed below.

Monitor Location	Annual Average (ug/m^3)	Year
Riviera Beach, Florida	7	1980
West Palm Beach, Florida	11	1979

Both of these locations are influenced by local sources and thereby give a conservative estimate of the background concentration from distant sources. Nevertheless, the addition of an 11 ug/m^3 background to the previously computed concentrations in the SCGC modeling will not result in a violation of an applicable ambient air quality standard.

Comment 12

It appears from the application that there are many major industries in the vicinity of the proposed modification. Please explain then, why assumed background values and calculations were used instead of actual monitored data.

Response

There are no FDER or EPA approved SO_2, CO and NO_2 monitors within 15 miles of the SCGC mill. The annual TSP background value is based on data from two PBCHD TSP monitors, both of which are FDER and EPA approved. We have explained our reasoning for not assigning a background value for 24-hour TSP in our response to comments 7 and 8. In our response to comment 11, we have explained our reasoning for assigning a background value of 0 ug/m^3 for SO_2; however, we note that a conservative value of 11 ug/m^3 would not result in a violation of any ambient standards. FDER modeling shows that projected NO_x and CO concentrations are well below ambient standards. We have assumed a conservative background value of 20 ug/m^3 for NO_x and could have assumed a conservative background value of 1 ppm for CO without approaching ambient standards for these two pollutants. These values for NO_x and CO are consistent with EPA monitoring guidelines applicable to projects submitting complete applications prior to June 8, 1981. Finally, this modification represents a projected air quality improvement over existing TSP and SO_2 ground level concentrations which are shown by modeling to exceed Florida ambient standards. Since SCGC has voluntarily proposed a modification which would result in a reduction of TSP and SO_2 ambient concentrations in the near future, we have chosen not to require a period of preconstruction monitoring for any pollutant.

Sincerely,

C. H. Fancy, P.E.
Deputy Chief
Bureau of Air Quality Management

CHF/bjm

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

December 2, 1981

Dr. Kent Williams
Air Facilities Branch
U.S. EPA Region IV
345 Courtland Street
Atlanta, Georgia 30365

Dear Dr. Williams:

RE: Sugar Cane Growers Cooperative (SCGC), Boiler #8, Belle Glade, Florida: PSD-FL-077

This letter is in response to the additional comments you made concerning the methodology used to show that the proposed SCGC modification would not result in a violation of the 24-hour TSP secondary standard. These additional comments were made in our December 1, 1981, telephone conversation in which we discussed the Department's November 20, 1981, letter responding to your original comments concerning this methodology (response to comments 7 and 8 in the letter).

In the letter we mentioned that SCGC's consultant used a design 24-hour TSP background value of 40 ug/m^3 which, when added to the modeled impact of the SCGC mill with other nearby sources included, would result in a second-high 24-hour TSP concentration of 149 ug/m^3. This background value was based upon the average 84th percentile concentration derived from monitoring data gathered at three regional stations. You commented that the use of a background TSP value based upon an average 84th percentile concentration is not consistent with EPA guidelines.

We noted in our conversation that the average of the annual geometric means from the three monitors could have been used as the background value instead of the average 84th percentile concentration. This value is 29 ug/m^3. We had chosen not to use this value, however, because the data at two of the three monitors had not been quality assured and the data from the third (PB-16) did not accurately reflect the impact of cane field burning on the air quality in the region surrounding the SCGC mill, since it was located upwind of the cane growing area. Instead, we had asked for and accepted, as additional assurance that the 24-hour secondary standard would not be violated, a statistical analysis by SCGC's consultant. This analysis demonstrated that the probability is reasonably low that the combined impact of modeled PM emissions from the SCGC mill and the existing air quality as measured at two Palm Beach County monitors would result in a violation of the 24-hour secondary standard. However, you commented that the use of a statistical analysis for this purpose is also not consistent with EPA guidelines.

We mentioned in our response to this comment that, when we were making our decision to accept the statistical analysis as an additional assurance that the standard would not be violated, we were taking into consideration that SCGC's consultant had accounted for all significant TSP sources within 50 kilometers of SCGC in their modeling (except for cane field burning), thus making the mill effectively remote. According to the monitoring guidelines which implemented the 1978 PSD regulations, a value of 30-40 ug/m^3 can be chosen for all averaging times if the source is remote and if no current representative monitoring data are available. On this basis, we feel we can accept 40 ug/m^3 as the 24-hour TSP background value and, even without the additional assurance of the statistical analysis, still be assured that the 24-hour secondary standard will not be violated.

Sincerely,

Mr. Clair Fancy
Deputy Chief
Bureau of Air Quality Management