WESTON
MANAGERS DESIGNERS/CONSULTANTS

WESTON WAY
WEST CHESTER, PA 19380
PHONE: 215-692-3030
TELEX: 83-5348

23 February 1991

RECEIVED
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DER - BAQM

Mr. C.H. Fancy, P.E.
Chief, Bureau of Air Regulation
State of Florida
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

Enclosed are five (5) copies of Champion International Corporation's Pensacola Florida Mill Package Boiler revised PSD permit application. The revisions reflect the changes in the background air quality concentration for nitrogen dioxide as requested by the Florida DER in our 22 February 1991 meeting. Also enclosed are the copies of the modified pages (pp 1-4, 4-16 and 4-17) which should be inserted in the three (3) copies currently on file at the DER. Please forward these page inserts to Mr. Bruce Miller and Mr. Cleveland Holladay.

We appreciate the department's assistance on this important project. Should you or your staff have any questions relative to this application, please do not hesitate to call Mr. Ed Inman at the Pensacola Mill (904) 968-2121 or me at (215) 430-7218.

Very truly yours,

ROY F. WESTON, INC.

John Barone

John B. Barone, Ph.D.
Technical Director

JBB/ese

cc: Bruce Miller
Cleveland Holladay

chch.jb

the annual emission increases associated with the construction of the No. 5 Package Boiler, a significant net emission increase is predicted for the single pollutant NO_x.

Based on the ambient air quality impact analysis for NO_x described in Section 4, the facility will have the following impacts on ambient air quality:

PSD Increment	
Federal PSD Increment for NO_x	25 ug/m^3
Package Boiler No. 5 Impact	4.89 ug/m^3
% of Federal Increment	20%

National Ambient Air Quality Standards	
National Ambient Air Quality Standard for NO_x	100 ug/m^3
No. 5 Package Boiler Impact	4.89 ug/m^3
All Major Sources Impact*	71.8 ug/m^3
Background Concentration	22.5 ug/m^3
Total Impact	94.3 ug/m^3

Based on the data above, the Proposed No. 5 Package Boiler will neither cause nor contribute to an exceedance of the applicable PSD increments or Air Quality Standards for NO_x.

* Includes No. 5 Package Boiler, all Champion sources, and all other major sources in Escambia and Santa Rosa counties.

the Mill in combination with other major sources of nitrogen oxides in the area (Table 4-5 sources). In addition, a background concentration from nearby monitors which represents distant source plus uninventoried source impacts, was added to the modeled concentration. This conservative approach does not account for the impact of major sources, included in the modeling analysis, on the monitored values used. Hence, the demonstration is likely to over-predict the actual air quality impacts in the area.

4.5.1 Background Nitrogen Dioxide

Data on the background concentration to be used in the ambient air quality analysis was provided by the Florida DER. The state has no SLAMS data for nitrogen oxides currently being collected in the Pensacola or Cantonment, Florida areas. Data was collected at a site in Escambia County near Pensacola in 1982-1985. This site (3540004F01) was located at the Ellyson Industrial Park in northern Pensacola. Concentrations measured at this site were:

	Annual Average Concentration		
	1982	1983	1984
Nitrogen Dioxide (ug/m^3)	13	14	21

In addition, data has been collected by Gulf Power Company for 1990 at two stations (CRIST #4 Brunson, CRIST #2 Monsanto). The annual average concentrations measured at these stations was 19 ug/m^3 and 10 ug/m^3, respectively. Based on these data and the previous data collected by Florida DER, a conservative background concentration would be 21 ug/m^3. Florida DER also provided data for sites in Jacksonville (Site No. 1960-032H02) and Tarpon Springs, Florida (Site No. 4380-002G03). The annual average background concentrations measured at these sites in 1990 were 28 ug/m^3 and 17 ug/m^3, respectively. Florida DER has requested that the average of these values (22.5 ug/m^3) be used as an extremely conservative regional background concentration for the NAAQS demonstration.

4.5.2 NAAQS Modeling Results

The results of the modeling analysis for all major sources in the area in combination with Champion Mill sources including the No. 5 Boiler are shown in Table 4-8 for the five years of modeling. Also shown in the table is the conservative background air quality level identified by Florida DER. The maximum annual combined impact (modeled sources plus background) is 94.28 ug/m^3. If the conservative concentration based on the data collected in Pensacola is used (21 ug/m^3) the maximum predicted annual concentration is 92.78 ug/m^3. Therefore, based upon either of the conservative analyses conducted, the No. 5 Boiler will neither cause nor contribute to an exceedance of the NAAQS for nitrogen dioxide.

TABLE 4-8

COMPARISON OF MAJOR SOURCE IMPACTS PLUS BACKGROUND TO NAAQS

	Concentration ug/m^3				
	1985	1986	1987	1988	1989
Major Sources Impact	62.23	65.05	62.32	62.49	71.78
Background Concentration	22.5	22.5	22.5	22.5	22.5
Total Impact	84.73	87.55	84.82	84.99	94.28
NAAQS	100	100	100	100	100

Printing and Writing Papers
375 Muscogee Road
P.O. Box 87
Cantonment, Florida 32533-0087
904 968-2121

Champion
Champion International Corporation

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DER - BAQM

February 22, 1991

Mr. Barry Andrews
P. E. Administrator
State of Florida
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Subject: No. 5 Package Boiler PSD Construction Permit Application

Dear Mr. Andrews,

Champion's Pensacola Mill is submitting a PSD construction permit application for the proposed No. 5 Package Boiler. Champion's submittal includes:

- Eight (8) No. 5 Boiler PSD construction permit application packages
- Dispersion modeling output hard copy
- Computer disk(s) containing dispersion modeling output and 1985-1989 meteorological data utilized in modeling analysis
- A $5,000 check for the required PSD permit application fee

The Department's cooperation in expediting the No. 5 Package Boiler construction permit is greatly appreciated. Please feel free to contact me if you have any questions, concerns, or comments regarding the No. 5 Package Boiler PSD construction permit application.

Sincerely,

Edward M. Inman

Edward M. Inman
Senior Process Engineer
Technical & Environmental Department

PSD Permit Application for A Proposed Package Boiler

Champion International Corporation Pensacola Florida Mill

February 1991

Prepared for:
Champion International Corporation
Cantonment, Florida

Submitted to:
Florida Department of Environmental Regulation
Division of Air Resources Management
Tallahassee, Florida

Prepared by:
ROY F. WESTON, INC.
West Chester, Pennsylvania

Review Engineer

CERTIFICATIONS

I certify that the statements made in this document for a construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the source and facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

Signed: F. D. Owenby

F. Doug Owenby,
Vice President/ Operations Manager

Date: 2/20/91

Telephone No. (904) 968-2121

This is to certify that the engineering features of this project have been examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department.

Signed: Randal M. Reynolds

RANDAL M. REYNOLDS
No. 38884

Randal M. Reynolds, P.E.

Roy F. Weston, Inc.
Company Name (Please Type)

1635 Pumphrey Ave., Auburn AL 36830

Florida Registration No. 38884

Date: Feb. 18, 1991 Telephone No. 205/826-6100

ch12591.jb

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

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FEB 22 1991
DER-BAQM

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Stationary, industrial [ ] New[1] [X] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: Champion International Corporation COUNTY: Escambia

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) No. 5 Package Boiler

SOURCE LOCATION: Street 375 Muscogee Road City Cantonment

UTM: East 469 North 3386

Latitude 30 ° 36 ' 19 "N Longitude 87 ° 19 ' 13 "W

APPLICANT NAME AND TITLE:

APPLICANT ADDRESS: P.O. Box 87, Cantonment, Florida 32533

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Champion International

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Furthe I agree to maintain and operate the pollution control source and pollution contr facilities in such a manner as to comply with the provision of Chapter 403, Florid Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transferab and I will promptly notify the department upon sale or legal transfer of the permitt establishment.

*Attach letter of authorization

Signed: F. D. Owenby

F. Doug Owenby, Vice President/Operations Manage
Name and Title (Please Type)

Date: 2/20/91 Telephone No. 904/968-2121

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project hav been designed/examined by me and found to be in conformity with modern engineerin principles applicable to the treatment and disposal of pollutants characterized in th permit application. There is reasonable assurance, in my professional judgment, tha

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department.

M. REYNOLDS CERTIFICATE No. 38884

Signed Randal M. Reynolds

Randal M. Reynolds, P.E.
Name (Please Type)

Roy F. Weston, Inc.
Company Name (Please Type)

1635 Pumphrey Avenue, Auburn, Alabama 36830
Mailing Address (Please Type)

Florida Registration No. 38884 Date: Feb. 18, 1991 Telephone No. 205/826-6100

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.

This application covers existing No. 5 Package Boiler currently operating under the conditions of a temporary permit issued by the DER. See Sections 1.3 and 2.3

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

Start of Construction (NA) See Section 2.3 Completion of Construction (NA) See Section 2.

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.)

(NA)

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

A017-161144; issued 3/30/89; expires 4/1/91

AC17-140962/PSD-F1-126; issued 12/17/87, expires 6/1/88

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr (NA) ; if seasonal, describe: (NA)

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No
   a. If yes, has "offset" been applied? (NA)
   b. If yes, has "Lowest Achievable Emission Rate" been applied? (NA)
   c. If yes, list non-attainment pollutants. (NA)
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? (NA)
   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

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

See attached application Section 5.0 for F-2 and Section 3.0 for F-3 and Section 3.0 for F-4.

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): (NA)

2. Product Weight (lbs/hr): (NA)

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
NO_x	19.5	85.4	0.2[a]	NA	19.5	85.4	Stack
CO	19.5	85.4	0.24[b]	NA	19.5	85.4	Stack
SO_2	0.12	0.53	BACT[c] (17-2.600(b)(c))	NA	0.12	0.53	Stack
Particulate Matter	0.98	4.3	BACT[d] (17-2.600(b)(b))	NA	0.98	4.3	Stack
Hydrocarbons	1.8	7.9	0.02[e]	NA	1.80	7.9	Stack

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

[a] Based on permit limit in temporary permit.

[b] Based on permit limit in temporary permit.

[c] Based on AP-42 value of 0.006 pounds/MMBtu.

[d] Based on AP-42 value of 0.05 pounds/MMBtu.

[e] Based on permit limit in temporary permi

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
(NOT APPLICABLE)				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Natural Gas	0.16	0.195	195

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: Trace Percent Ash: negligible

Density: (NA) lbs/gal Typical Percent Nitrogen: 1.1 to 3.2 (vol)

Heat Capacity: 1,000 ± Btu/CF (NA) BTU/gal

Other Fuel Contaminants (which may cause air pollution): (NA)

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average (NA) Maximum (NA)

G. Indicate liquid or solid wastes generated and method of disposal.

(NA)

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 46.9 ft. Stack Diameter: 4 ft.

Gas Flow Rate: 65,000 ACFM 35,880 DSCFM Gas Exit Temperature: 500 °F.

Water Vapor Content: 18 % Velocity: 86.2 FPS

SECTION IV: INCINERATOR INFORMATION
(NOT APPLICABLE)

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patholog-ical)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (lbs/hr)							

Description of Waste ____________________

Total Weight Incinerated (lbs/hr) __________ Design Capacity (lbs/hr) __________

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ____________________

Date Constructed __________ Model No. __________

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: __________ Stack Temp. ______

Gas Flow Rate: __________ ACFM __________ DSCFM* Velocity: __________ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: ☐ Cyclone ☐ Wet Scrubber ☐ Afterburner

☐ Other (specify) ____________________

Brief description of operating characteristics of control devices: NA

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NA

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Refer to indicated sections and pages in the attached application document.

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

   Not Applicable

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made. See Section 2.3-2.5 pp 2-1 to 2.7. Methods 1, 2, 3, 4, and 7 FR Part 60 will be used to demonstrate compliance.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

   See Section 2.3 - 2.5 pp 2-1 to 2-7 and Table 2-1 pp 2-5, Table 2-2 pp 2-7.

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

   NA

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

   NA

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

   See Attachment A-1

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

   See Figure 1-1 p 1-2, Figure 2-1 p 2-2 and Figure 2-2 p 2-3.

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

   See Figure 2-1 p 2-2 and Figure 2-2 p 2-3.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

Enclosed

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

NA

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

Refer to indicated sections and pages in the attached application document.

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

Section 5.0 pp 5-1 to 5-14

[ ] Yes [X] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No See Section 5.2 pp 5-2 to 5-13

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
Nitrogen Dioxide	0.1 lb/10^6 Btu

D. Describe the existing control and treatment technology (if any).

See Section 5.3 p 5-12

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. **Useful Life:**   6. **Operating Costs:**

7. **Energy:**   8. **Maintenance Cost:**

9. **Emissions:**

Contaminant	Rate or Concentration

10. **Stack Parameters**

a. **Height:** 46.9 ft.   b. **Diameter:** 4 ft.

c. **Flow Rate:** 65,000 ACFM   d. **Temperature:** 500 °F.

e. **Velocity:** 86.2 FPS

E. **Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).**

See Section 5.2 pp 5-2 to 5-12

1.

a. **Control Device:**   b. **Operating Principles:**

c. **Efficiency:**[1]   d. **Capital Cost:**

e. **Useful Life:**   f. **Operating Cost:**

g. **Energy:**[2]   h. **Maintenance Cost:**

i. **Availability of construction materials and process chemicals:**

j. **Applicability to manufacturing processes:**

k. **Ability to construct with control device, install in available space, and operate within proposed levels:**

2.

a. Control Device: b. Operating Principles:

c. Efficiency:[1]   d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2]   h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

---

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected: **See Section 5.3 p 5-12**

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

---

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data Not Applicable

1. __________ no. sites __________ TSP __________ ( ) SO^{2}* __________ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded ______________________________

Attach all data or statistical summaries to this application.

---

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? ☐ Yes ☐ No

b. Was instrumentation calibrated in accordance with Department procedures?

☐ Yes ☐ No ☐ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. 5 Year(s) of data from 1 / 01 / 85 to 1 / 01 / 89
(month day year) (month day year)

2. Surface data obtained from (location) Pensacola, Florida

3. Upper air (mixing height) data obtained from (location) Apalachacola, Florida

4. Stability wind rose (STAR) data obtained from (location) Pensacola, Florida

C. Computer Models Used

1. Industrial Source Complex Long Term Modified? No If yes, attach description.

2. SCREEN Modified? No If yes, attach description.

3. ______ Modified? If yes, attach description.

4. ______ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables. See Appendix D

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	Not Applicable	grams/sec
SO^2	Not Applicable	grams/sec

E. Emission Data Used in Modeling
See Section 4.3 Table 4-3 p.4-9, Table 4-5 p 4-12
Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.
See attached application document

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.
See Section 4.6 pp 4-16 to 4-21

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

See attached application document

TABLE OF CONTENTS

TABLE OF CONTENTS Continued

LIST OF TABLES

LIST OF TABLES Continued

LIST OF FIGURES

SECTION 1

INTRODUCTION AND SUMMARY

1.1 Project Description

Champion International Corporation (CHAMPION) plans to retain the temporary 195 MMBtu per hour No. 5 Package Boiler as a permanent part of their pulp and paper mill in Cantonment, Florida. Originally, CHAMPION intended to repair and upgrade two existing power boilers over a two year period and thereby eliminate the need for the package boiler. However, CHAMPION determined that the two power boilers could not be sufficiently upgraded to meet their original design steam requirements. Hence, Champion is requesting a construction permit for the No. 5 Package Boiler. The proposed No. 5 Package Boiler installation will comply with all state and Federal air quality regulations. Figure 1-1 is a location map of CHAMPION's existing Pensacola Mill.

This report provides all of the necessary supporting documentation to meet the information requirements of the Florida Department of Environmental Regulation for permits to construct the proposed permanent addition of the No. 5 Package Boiler. This report specifically addresses the Prevention of Significant Deterioration (PSD) and New Source Review Requirements. Appendix A includes the Florida DER Permit Application Form for the proposed boiler.

The approach taken is extremely conservative in demonstrating compliance with all applicable state and Federal emission limitations and ambient air quality standards. More specifically, the values selected for emission rates, the assumptions used in computer modeling analyses, and the interpretation of model results are all deliberately prejudiced on the side of demonstrating the maximum practical "worst case" conditions.

CHAMPION is committed to achieving the stringent emission limitations identified in this report as Best Available Control Technology (BACT). The proposed BACT emission rates meet or exceed the most stringent Subpart Db New Source Performance Standards (NSPS). The actual impacts of the proposed project on ambient air quality are expected to be lower than those presented.

1.2 Application Organization

The permit application has been organized into the following sections:

- Section 2 - Description of Existing Mill and Proposed Project presents site information; the general plans and specifications for the proposed project; an emissions inventory for all mill NO_x sources.

SOURCE: BASE MAP ADAPTED FROM USGS 1:250,000 SERIES, PENSACOLA, FLA-ALA QUADRANGLE, 1957, REVISED 1970.

CHAMPION INTERNATIONAL CORPORATION
PENSACOLA FACILITY
CANTONMENT, ESCAMBIA COUNTY
FLORIDA

FIGURE 1-1
GENERAL LOCATION MAP OF THE
PENSACOLA FACILITY

- Section 3 - Applicable Regulations identifies applicable Federal and state regulations including PSD regulations, Florida emission and ambient air quality regulations.

- Section 4 - Air Quality Impact Analysis presents an analysis of the incremental increases in ambient pollutant concentrations anticipated from the No. 5 Boiler. An analysis of other major sources with the proposed boiler is also included to demonstrate compliance with NAAQS. A discussion is presented on the effects that the incremental increases in ambient pollution concentrations are anticipated to have on air quality related values including visibility, acidification of rainfall and soils, aquatic and terrestrial ecology and associated growth.

- Section 5 - Best Available Control Technology identifies the proposed Best Available Control Technology (BACT), reviews alternative control technologies, and provides support for the selection of BACT using EPA's "Top Down" approach.

1.3 Summary

Based on the results of the BACT determination for the pollutant(s) of concern, the emissions from the proposed modifications will meet all applicable state and Federal emission regulations. The maximum "worst case" emissions of criteria pollutants from the No. 5 Package Boiler are:

	No. 5 Package Boiler Emissions	
Pollutant	Maximum Hourly (lbs/hr)	Annual** (tons/yr)
PM-10*	0.98	4.3
TSP	0.98	4.3
SO_2	0.12	0.53
NO_x	19.5	85.4
CO	19.5	85.4
VOC	1.8	7.9

* It was conservatively assumed that all particulate matter emissions are in the form of PM-10.

** Emission rates are based upon maximum hourly emission rates and 8,760 total annual hours of operation.

The existing Pensacola Mill presently constitutes a major stationary source under the PSD regulations. Therefore, based upon the annual emission increases associated with the construction of the No. 5 Package Boiler, a significant net emission increase is predicted for the single pollutant NO_x.

Based on the ambient air quality impact analysis for NO_x described in Section 4, the facility will have the following impacts on ambient air quality:

PSD Increment	
Federal PSD Increment for NO_x	25 ug/m^3
Package Boiler No. 5 Impact	4.89 ug/m^3
% of Federal Increment	20%

National Ambient Air Quality Standards	
National Ambient Air Quality Standard for NO_x	100 ug/m^3
No. 5 Package Boiler Impact	4.89 ug/m^3
All Major Sources Impact*	71.8 ug/m^3
Background Concentration	28.0 ug/m^3
Total Impact	99.8 ug/m^3

Based on the data above, the Proposed No. 5 Package Boiler will neither cause nor contribute to an exceedance of the applicable PSD increments or Air Quality Standards for NO_x.

* Includes No. 5 Package Boiler, all Champion sources, and all other major sources in Escambia and Santa Rosa counties.

Derating:

#1 214 → 175 MM Btu/hr
steam 140,000 → 120,000 lbs/hr steam
#2 214 → 170 "
steam 140,000 → 80,000 lbs/hr steam (op. permit)

SECTION 2

DESCRIPTION OF EXISTING MILL AND PROPOSED MODIFICATION

2.1 Physical Setting

The CHAMPION Pensacola Mill is located in Escambia County, Florida, near the town of Cantonment. Figure 2-1 is a site location map showing the proximity of the facility to the town of Cantonment. The land area around the site is relatively flat terrain and would be classified as a rural land use pattern based on EPA's classification scheme. The air quality in the area has been designated as attainment or unclassifiable for all ambient air quality standards.

2.2 Existing Mill Description

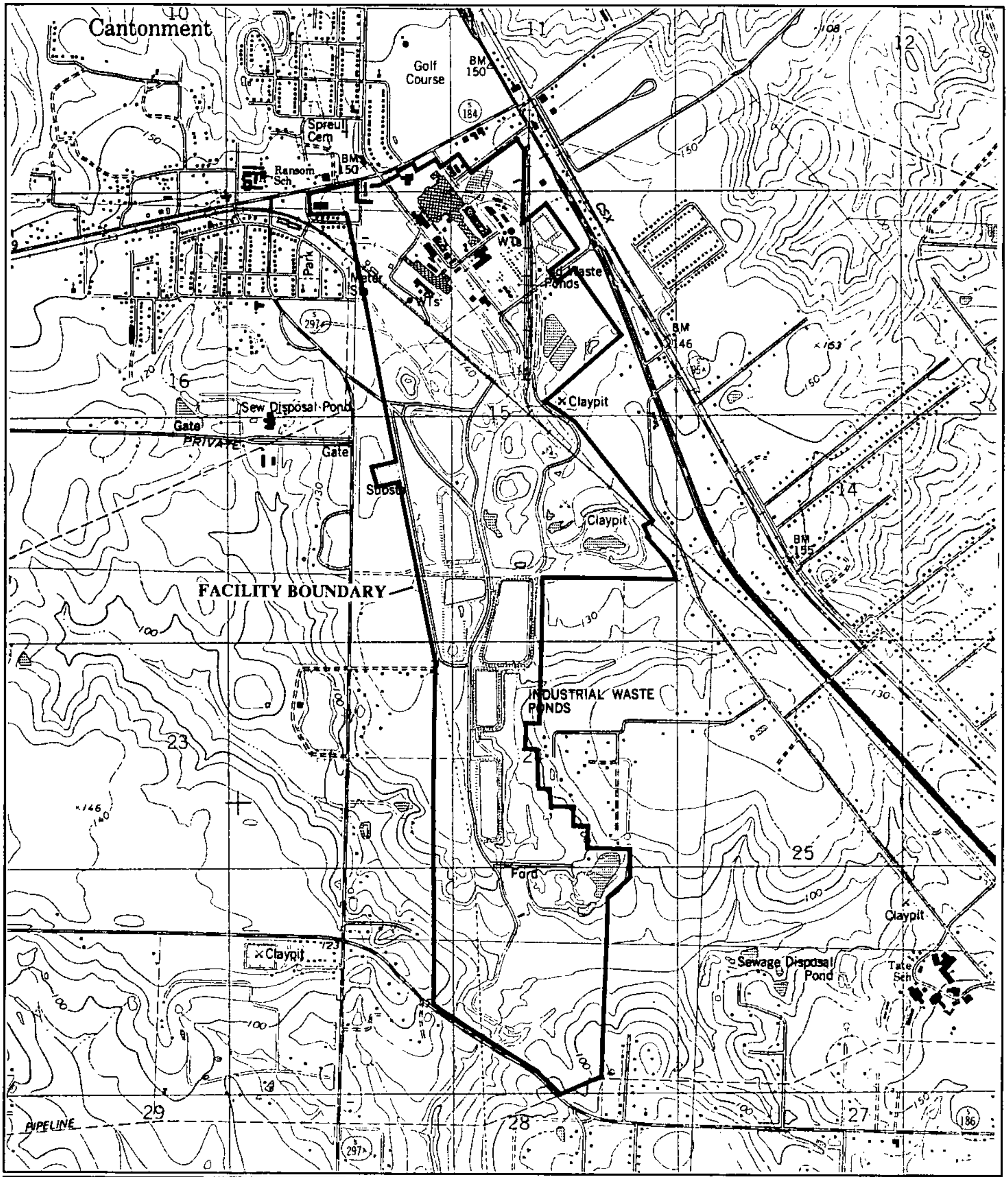
CHAMPION's existing pulp mill has been in operation since 1941. Major mill expansion projects were completed in 1981 and 1986. The 1986 expansion resulted in a complete conversion to production of bleached kraft fine paper. The existing facilities were permitted by the Florida Department of Environmental Regulation (DER) in 1985. A temporary permit to operate the No. 5 Package Boiler was granted to CHAMPION in 1988. The CHAMPION Pensacola Mill is currently permitted for 1,400 air dried bleached tons of pulp per calendar day.

The existing bleached kraft pulp mill includes wood preparation and storage, coal/wood fuel handling and storage, batch digesters, a continuous digester, brown stock washing, oxygen delignification, pulp bleaching facilities, recovery boilers, power boilers, black liquor evaporators, smelt dissolving tanks, a lime kiln and calciner, recausticizing facility, and tall oil and turpentine by-products facilities. Figure 2-2 presents a plot plan of the facility identifying the location of major emission points.

2.3 CHAMPION Planned Facility Modification

The No. 5 Package Boiler was installed in 1987 and was put on line during February of 1988. Permit to construct No. AC17-140962/PSD-Fl-126 was issued to CHAMPION by the Florida Department of Environmental Regulation for the installation of this unit. A temporary permit to operate (AO17-161144) was issued by the DER. This permit expires on 1 April 1991.

The unit is fired by natural gas (approximately 1,000 Btu/ft^3) with a maximum firing rate of 195 million Btu's per hour (195 MCF/hr). It is designed to provide 125,000 pounds of low pressure steam per hour. The boiler will typically fire 130 to 160 million BTUs per hour during normal operations. In addition to the No. 5 Package Boiler, process steam is supplied by Power Boilers #1, #2, #3 and



NORTH

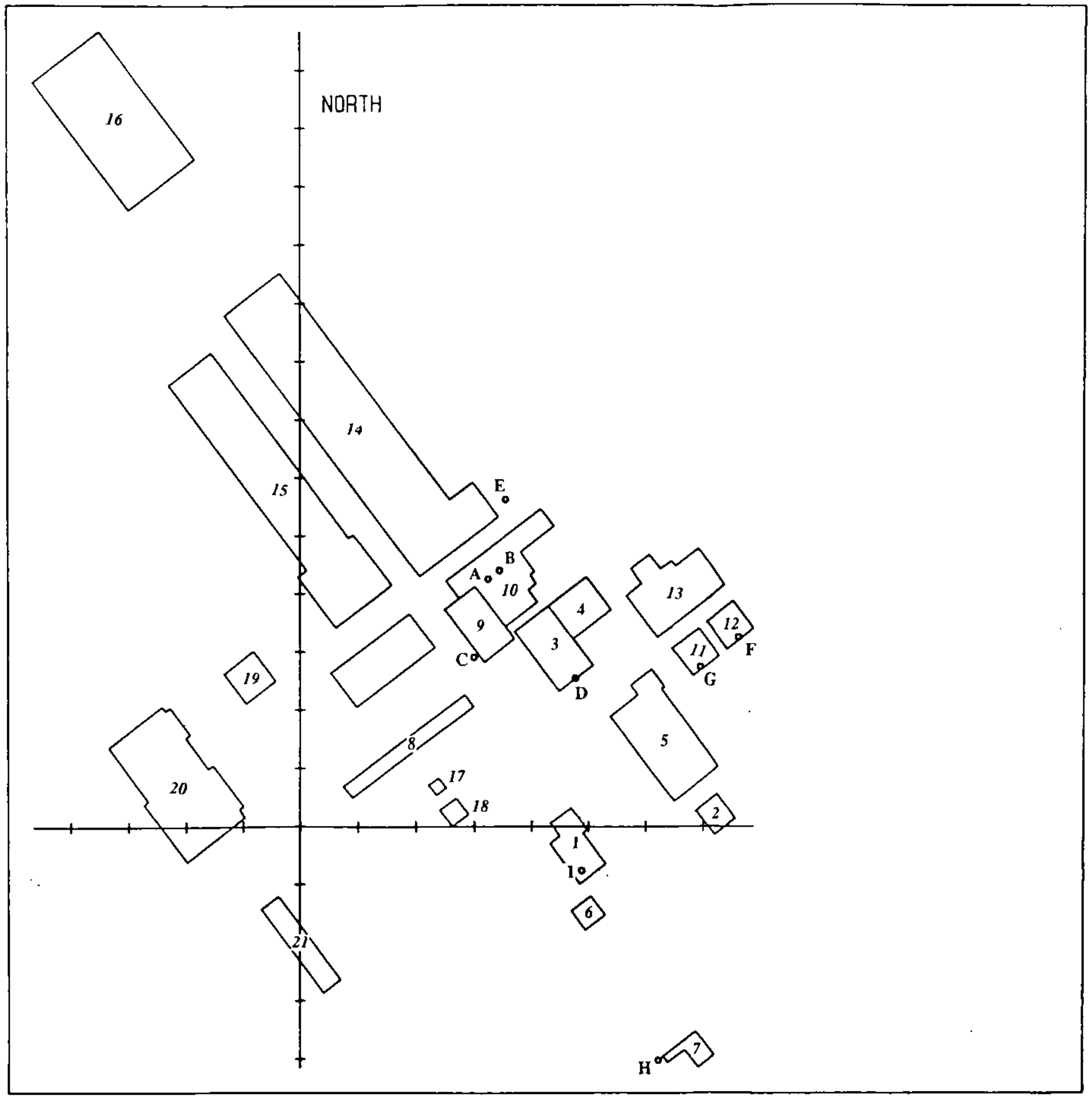
0 1000 2000 4000

SCALE IN FEET

SOURCE: BASE MAP ADAPTED FROM USGS 7.5 MINUTE SERIES, CANTONMENT, FLA. QUADRANGLE, 1978, PHOTOREVISED 1987.

CHAMPION INTERNATIONAL CORPORATION
PENSACOLA FACILITY
CANTONMENT, ESCAMBIA COUNTY
FLORIDA

FIGURE 2-1
LOCATION MAP OF THE PENSACOLA FACILITY



BUILDING/STRUCTURE

1. -	LIME RECOVERY BUILDING
2. -	COOLING TOWER
3. -	NO. 4 POWER BOILER
4. -	TURBINE GENERATOR BUILDING
5. -	EVAPORATORS
6. -	LIME KILN NORTH
7. -	LIME KILN SOUTH
8. -	BATCH DIGESTERS
9. -	NO. 3 POWER BOILER
10. -	NO.1 & 2 BOILER
11. -	RECOVERY BOILER PRECIPITATOR 1
12. -	RECOVERY BOILER PRECIPITATOR 2
13. -	RECOVERY BOILERS
14. -	PAPER MACHINE COMPLEX
15. -	HIGH BAY STORAGE BUILDING
16. -	WAREHOUSE
17. -	KAMYR DIGESTER
18. -	KAMYR DIFFUSER
19. -	NO. 9 H. D. STORAGE
20. -	BLEACH PLANT
21. -	CHIP SILO

SOURCES:

A. -	NO. 1 POWER BOILER STACK
B. -	NO. 2 POWER BOILER STACK
C. -	NO. 3 POWER BOILER STACK
D. -	NO. 4 POWER BOILER STACK
E. -	NO. 5 POWER BOILER STACK
F. -	RECOVERY BOILER STACK 1
G. -	RECOVERY BOILER STACK 2
H. -	LIME KILN STACK
I. -	CALCINER STACK

NORTH
0 100 200 400
SCALE IN FEET

SOURCE: BASE MAP ADAPTED FROM DRAWINGS SUPPLIED BY CHAMPION

CHAMPION INTERNATIONAL CORPORATION
PENSACOLA FACILITY
CANTONMENT, ESCAMBIA COUNTY
FLORIDA

CHAMPEN2-H/DM-2/91

FIGURE 2-2
LOCATION OF STACKS AND PRIMARY BUILDINGS IDENTIFIED FOR SCHULMAN-SCIRE DOWNWASH ANALYSIS

#4 and Recovery Boilers No. 1 and No. 2. This application does not affect those units. The purpose of the No. 5 Package Boiler is to replace lost steam production from Boilers No. 1 and 2 and will not be used for any additional process increases.

The No. 5 Package Boiler was built in 1964. The boiler tubes were replaced in 1982 by Holman Boiler Works, Inc. of Dallas, Texas. The boiler is equipped with a Coen Burner, recently (1987) rebuilt to lower NO_x formation. The unit is also equipped with a flue gas recirculation system whereby up to 5% of the exhaust gases are recirculated back to the burner to keep excess air to a minimum and further reduce NO_x emissions. The exhaust stack parameters for the No. 5 Package Boiler are shown below.

No. 5 Package Boiler Stack Parameters*

Stack Height, ft.	46.9
Stack Diameter, ft.	4.0
Gas Flow Rate, acfm	65,000
Stack Temp., °F	500
Gas Flow Rate, scfm	35,800
Moisture content, %	18
Exit Velocity, fps	86.2

* With Flue Gas Recirculation

CHAMPION originally intended to rebuild and upgrade existing Power Boilers No. 1 and No. 2 over a two year period and eliminate the need for the package boiler. It was later determined that the No. 1 and No. 2 Power Boilers could not be adequately upgraded to meet CHAMPION's needs. Consequently, the steam capacity provided by the No. 5 Package Boiler is now required on a full time basis to replace lost steam production on No. 1 and No. 2 Power Boilers. Typically when the No. 5 Package Boiler is operating, either the No. 1 or No. 2 Power Boiler will be off-line.

modeled
at max. prod.
rate @ #1, #2
P.B. + #5 P.B.

2.4 Source Emissions Summary

The existing Pensacola pulp mill emission rates for all NO_x sources are summarized in Table 2-1. The table includes the stack and exhaust gas parameters for each source as used in the modeling study for the ambient impact analysis.

The NO_x emission rates presented in Table 2-1 were derived from existing permit conditions (#3 Power Boiler, #4 Power Boiler,

TABLE 2-1

NO_x SOURCE EMISSIONS INVENTORY FOR EXISTING MILL

Source	Stack Height ft	Diameter ft	Vel ft/sec	Temperature °F	Volume ACFM	NO_x Emission Rate lb/hr
Lime Kiln	136	6.5	25.1	170	50,000	45.0[a]
#1 Power Boiler	67	6.5	55.5	485	110,500	52.5[b]
#2 Power Boiler	67	6.5	49.5	380	98,550	85.0[c]
#3 Power Boiler	148	8.0	25.0	145	75,000	187.6[d]
#4 Power Boiler	221	12.0	33.6	144	228,000	466.2[e]
#5 Package Boiler	46.9	4.0	86.2	500	65,000	19.5[f]
Calciner[c]	117.6	4.0	30.1	164	22,710	15.3[g]
Recovery Boiler #1	181.75	9.0	80.0	470	305,000	100[h]
Recovery Boiler #2	181.75	9.0	80.0	440	305,000	100[h]

[a] Based on 0.3 lb/MMBtu and 150 MMBtu/hr maximum firing rate.

[b] Based on "worst case" test data which indicated 0.3 lb/MMBtu and a maximum firing rate of 175 MMBtu/hr.

[c] Based on "worst case" test data which indicated 0.5 lb/MMBtu and a maximum firing rate of 170 MMBtu/hr.

[d] Based on permit limits of 0.7 lb/MMBTU and a maximum firing rate of 268 MMBtu/hr.

[e] Based on permit limits of 0.7 lb/MMBtu and a maximum firing rate of 666 MMBtu/hr.

[f] Based on proposed permit limit of 0.1 lb/MMBtu and a maximum firing rate of 195 MMBtu/hr.

[g] Based on a permit limit of 15.3 lb/hr of NO_x.

[h] Based on "worst case" test data which indicated maximum hourly emissions of 100 lb/hr (100 ppm).

Calciner), proposed permit conditions (No. 5 Package Boiler) and "worst case" emissions test data (#1 and #2 Power Boilers, #1 Recovery Boiler, #2 Recovery Boiler). The proposed NO_x permit limit of 0.10 #/MMBtu for the No. 5 Package Boiler is supported by emission test data collected utilizing flue gas recirculation (5%). The 19.5 lb/hr NO_x emission rate for the Package Boiler corresponds to a proposed permit limit of 0.10 lbs/MMBtu.

Based upon the hourly NO_x emission rates presented in Table 2-2, annual NO_x emissions prior to the addition of the No. 5 Package Boiler are approximately 4,700 tons per year based upon 8,760 hours of operation per year. The addition of the No. 5 Package Boiler will result in an additional 85.4 tons of NO_x emissions per year at the Mill based on allowable emission rates. It should be noted that since Power Boiler No. 1 and No. 2 will be run at reduced capacities, the actual change in emissions will be zero or a slight decrease.

2.5 Other Criteria Pollutants

A summary of the expected emission rates from the No. 5 Package Boiler of particulate matter, PM-10, sulfur dioxide, carbon monoxide, and hydrocarbons is presented in Table 2-2. The emissions of the above criteria pollutants are less than the PSD threshold levels requiring new source review.

Particulate matter emissions were derived using Table 1.4-1, Uncontrolled Emission Factors for Natural Gas Combustion in U.S. EPA Publication AP-42. A conservative factor for utility boilers of 5 lbs per million cubic feet of natural gas was used. Based on the maximum heat input of 195 MMBtu/hr and 8,760 hours of operation per year maximum hourly and annual particulate matter emissions are 0.98 lbs/hr and 4.3 tons/year respectively. All of the particulate matter generated is assumed to be PM-10.

Sulfur dioxide emissions were derived using Table 1.4-1, Uncontrolled Emission Factors for Natural Gas Combustion in U.S. EPA Publication AP-42. A conservative factor for utility boilers of 0.60 lbs per million cubic feet of natural gas was used. Based on the maximum heat input of 195 MMBtu/hr and 8,760 hours of operation per year, maximum hourly and annual sulfur dioxide emissions are estimated to be 0.12 lbs/hr and 0.53 tons/year respectively.

The carbon monoxide emission rate in Table 2-2 was derived from actual emission tests conducted on the No. 5 Package Boiler in May of 1989. Based on a "worst case" measured mass emission rate approximately 0.1 pounds of CO per MMBtu, a maximum heat input of 195 MMBtu/hr and 8,760 hours of operation per year, annual CO emissions are estimated to be 85.41 tons/year.

TABLE 2-2

EMISSION RATES OF OTHER CRITERIA POLLUTANTS

Pollutant	Emission Rate lbs/hr	Derivation
Particulate Matter	0.98	AP-42
PM-10	0.98	AP-42[a]
Sulfur Dioxide	0.12	AP-42
Carbon Monoxide	19.5	Source Testing[b]
Hydrocarbons	1.80	Source Testing[b]

[a] Conservatively assumed that all particulate matter is PM-10.

[b] Source testing conducted by WESTON - ATC during the period of 16-17 May 1989 with flue gas recirculation system operating.

The hydrocarbon emission rate in Table 2-2 was derived from actual emission tests conducted on the No. 5 Package Boiler in May of 1989. Based on a measured hydrocarbon concentration of 20 ppm (vol, dry), a volumetric flow rate of 33,000 dscfm (0°C, 1 atm) and 8,760 hours of operation per year, the hourly and annual hydrocarbon emissions are estimated to be 1.8 lbs/hr and 7.9 tons/year respectively.

SECTION 3

APPLICABLE REGULATIONS

The following subsections contain a summary of all applicable Federal and State of Florida regulations effecting the proposed project.

3.1 Federal Standards

The proposed project is potentially subject to three Federal Regulations. These include:

- New Source Performance Standards (NSPS)
- Prevention of Significant Deterioration (PSD) Regulations
- New Source Review (NSR) which includes a demonstration of compliance with National Ambient Air Quality Standards (NAAQS)

These regulations are discussed below.

3.1.1 New Source Performance Standards (NSPS)

The United States Environmental Protection Agency (U.S. EPA) has promulgated standards of performance for industrial - commercial - institutional steam generating units at 40 CFR 60.280, Subpart Db. These NSPS regulations apply to steam generating units on which construction, modification, or reconstruction commenced after June 19, 1984 and that have a heat input capacity from fuels combusted in the steam generating unit of greater than 100 million Btu/hour.

The maximum heat input capacity to the No. 5 Package Boiler is 195 million BTUs per hour. The boiler was constructed circa 1964 and was last modified or reconstructed in 1982 (tube replacement) by its previous owner, Holman Boiler Works of Dallas Texas (see Appendix C). In the previous temporary permit application reviewed by Florida DER for this boiler, it was determined that the boiler was not subject to NSPS based on its construction history. Hence, based on the effective data of the regulations and a previous Florida DER determination, the unit is not subject to the NSPS requirements. It should be noted, however, that the boiler will meet the emission limits contained in the NSPS for nitrogen oxides.

3.1.2 Prevention of Significant Deterioration (PSD) and New Source Review(NSR)

The only sources subject to the PSD regulations are "major stationary sources" and "major modifications" located in areas designated as attainment or unclassifiable for NAAQS.

CHAMPION's Pensacola mill already qualifies as a major stationary source since it is a kraft pulp mill which emits more than 100 tons per year of a criteria pollutant. Therefore the task at hand is to determine whether the addition of the No. 5 Package Boiler will constitute a major modification under the regulations. Major modification is defined in the regulations as:

> "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to the regulations under the Act."

Table 3-1 identifies the significant net emissions increase levels for the PSD pollutants and compares them to the estimated emissions for the No. 5 Package Boiler. As shown in the table, there will be a significant net emissions increase for nitrogen oxides resulting from the addition of the No. 5 Package Boiler.

Under PSD, each pollutant for which a significant net emission increase occurs must undergo a PSD analysis. This involves the following:

- Best Available Control Technology (BACT) analysis.
- PSD Increment Consumption Analysis, including other increment consuming sources in the area.
- National Ambient Air Quality Standards (NAAQS) impact analysis.
- Impacts on Class I areas analysis.
- Additional impact analysis.

BACT Analysis

As noted in Section 2.4, the only specific emissions unit undergoing a major modification as defined in the PSD regulations is the No. 5 Package Boiler. For all pollutants emitted from the No. 5 Package Boiler at levels exceeding the significance levels (i.e., NO_x), a control technology must be selected and defended that will result in the maximum reduction in pollutant emissions considered achievable using current technology. Energy requirements, environmental impacts, and economic impacts must be considered in the BACT analysis and defense. According to the latest EPA guidance, the BACT analyses must be conducted using a "top-down" methodology. This requires beginning the technology evaluation by looking at the control technology which results in the maximum level of emission reduction for a similar source which is currently available. If it is demonstrated that this level of control is not technically or economically feasible for the source then the next most stringent level of control is evaluated. The process continues until an acceptable level is identified.

TABLE 3-1

POLLUTANT SIGNIFICANT LEVELS*

Pollutant	Significant Emission Level (ton/yr)	Champion's Proposed No. 5 Boiler Emission Rates (tons/yr)	CHAMPION's Proposed No. 5 Boiler Significant (yes/no)
PM-10	15	4.3	no
Suspended Particulate	25	4.3	no
Sulfur Dioxide	40	0.53	no
Nitrogen Oxides	40	85.4	yes
Volatile Organic Compound	40	7.9	no
Carbon Monoxide	100	85.4	no
Total Reduced Sulfur	10	0	no

* From EPA PSD regulations.

PSD Increment Consumption

Federal PSD increments are established only for TSP, SO_2, and NO_x as shown in Table 3-2. An ambient air quality analysis is needed to demonstrate that the PSD increments will not be exceeded by the boiler project. Since the only pollutant emitted in significant quantities under the PSD regulation is nitrogen dioxide, the analysis is only required for this pollutant. The Champion Pensacola Mill is located in a Class II area; hence, the Class II increments for NO_x must be met by the proposed project.

National Ambient Air Quality Standards

An ambient air quality analysis must be conducted to demonstrate that the project's air quality impact plus applicable background levels do not exceed the NAAQS shown in Table 3-3. The only pollutants for which this demonstration is required are pollutants emitted in excess of the PSD significance levels identified in Table 3-1. Therefore, for the boiler project the NAAQS analysis is only required for nitrogen dioxide. Florida has adopted the NAAQS for NO_x; hence, by complying with the Federal standards, the state standards are also met.

Impacts on Class I Areas

Any source within 100 kilometers of a Class I area must also comply with the significant levels for air quality impacts. Since the proposed facility is not within 100 kilometers of any Class I area, (see Figure 3-1) and no significant impact is anticipated at any Class I area, the proposed modification is not subject to this provision of the PSD review process.

Additional PSD Impacts Analysis

Any source subject to PSD must also provide an analysis of any adverse impacts that might occur due to the project on:

- Visibility
- Soils
- Vegetation
- Growth

This analysis must be conducted for the area in which the proposed facility will have an impact.

3.2 Florida DER Regulations

3.2.1 Part VI Emission Limiting and Performance Standards

Section 17-2.600, Paragraph 6 of the Florida DER regulations specifically address fossil fuel steam generators with heat input less than 250 million BTU per hour. The standards apply to new and existing sources and are summarized in Table 3-4.

TABLE 3-2

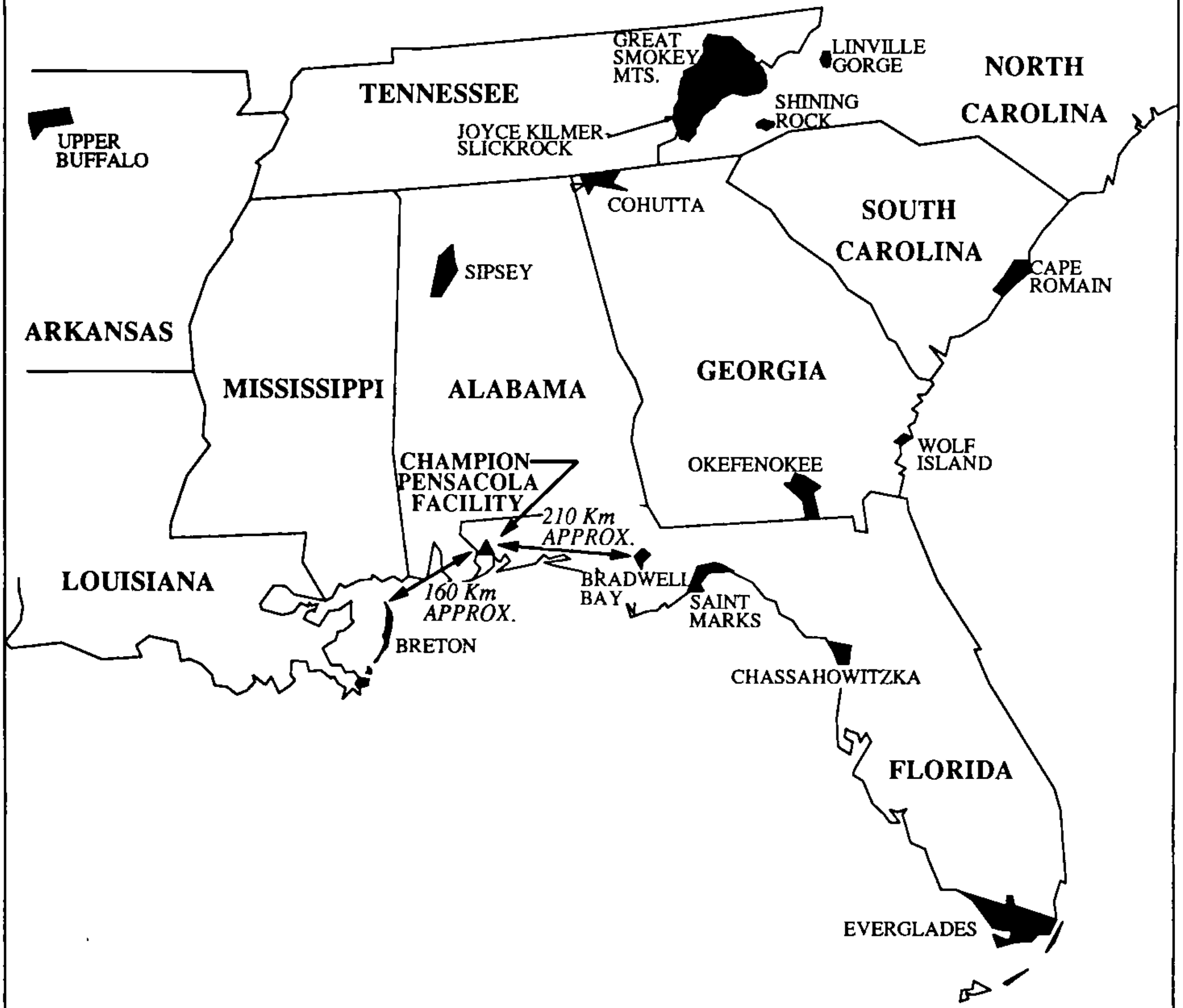
FLORIDA DER AMBIENT AIR QUALITY STANDARDS

Pollutant	Type of Standard	Averaging Time	Compliance Frequency Parameter	Concentration	
				ug/m^3	ppm
Sulfur Oxides (as sulfur dioxide)	Primary	24 hour	Annual maximum	260	0.10
		1 hour	Arithmetic mean	60	0.20
	Secondary	3 hour	Annual maximum	1,300	0.5
Particulate Matter	Primary	24 hour	Annual maximum	260	—
		24 hour	Annual Geometric mean	75	—
	Secondary	24 hour	Annual maximum	150	—
		24 hour	Annual geometric mean	60	—
PM-10	Primary	24 hour	Annual maximum	150	—
	Primary	24 hour	Annual arithmetic average	50	—
Carbon Monoxide	Primary	1 hour	Annual maximum	40,000	35
	Secondary	8 hour	Annual maximum	10,000	9
Ozone	Primary and Secondary	1 hour	Annual maximum	235	0.12
Nitrogen Dioxide	Primary and Secondary	1 year	Arithmetic mean	100	0.05
Lead	Primary and Secondary	3 months	Arithmetic mean	1.5	—

TABLE 3-3

FEDERAL NATIONAL PRIMARY AND SECONDARY AMBIENT AIR QUALITY STANDARDS

Pollutant	Type of Standard	Averaging Time	Compliance Frequency Parameter	Concentration ug/m^3	Concentration ppm
Sulfur Oxides (as sulfur dioxide)	Primary	24 hour	Annual maximum	367	0.14
		1 hour	Arithmetic mean	80	0.03
	Secondary	3 hour	Annual maximum	1,300	0.5
Particulate Matter	Primary	24 hour	Annual maximum	260	—
		24 hour	Annual Geometric mean	75	—
	Secondary	24 hour	Annual maximum	150	—
		24 hour	Annual geometric mean	60	—
PM-10	Primary	24 hour	Annual maximum	150	—
	Primary	24 hour	Annual arithmetic average	50	—
Carbon Monoxide	Primary	1 hour	Annual maximum	40,000	35
	Secondary	8 hour	Annual maximum	10,000	9
Ozone	Primary and Secondary	1 hour	Annual maximum	235	0.12
Nitrogen Dioxide	Primary and Secondary	1 year	Arithmetic mean	100	0.05
Lead	Primary and Secondary	3 months	Arithmetic mean	1.5	—



NORTH

MAP IS NOT TO SCALE AND IS MEANT TO BE REPRESENTATIONAL OF DISTANCES ONLY

SOURCE:BASE MAP ADAPTED FROM U.S. EPA

CHAMPEN3-H/DM-2/91

CHAMPION INTERNATIONAL CORPORATION
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CANTONMENT, ESCAMBIA COUNTY
FLORIDA

FIGURE 3-1
FEDERAL MANDATORY CLASS I AREAS
IN THE VICINITY OF THE FACILITY

TABLE 3-4

SUMMARY OF FLORIDA DER EMISSION LIMITS FOR FOSSIL FUEL FIRED STEAM GENERATORS WITH LESS THAN 250 MILLION BTU/HR HEAT INPUT

Pollutant	Emission Level
Visible Emissions	20% Opacity (one 6-minute period per hour not exceeding 27% or one 2-minute period per hour not exceeding 40%)
Particulate Matter	Best Available Control Technology pursuant to Section 17-2.630
Sulfur Dioxide	Best Available Control Technology pursuant to Section 17-2.630

The particulate matter and SO_2 emission limits under Section 17-2-600 require the application of best available control technology as determined by the DER pursuant to the guidelines in Section 17-2630 of the DER Regulations. In determining BACT for proposed sources the DER gives consideration to:

- Any U.S. EPA BACT determinations for the applicable source category
- New Source Performance Standards
- All scientific, engineering, and technical information available to DER
- Emission limits on BACT determination for applicable source categories of other states
- The social and economic impact of the application of such technology

The Proposed No. 5 Package Boiler will only burn clean fuel (natural gas). The use of natural gas has been determined by EPA and Florida DER in the past to represent BACT for particulate matter and sulfur dioxide. Hence, the proposed boiler will meet this DER regulatory requirement.

3.2.2 New Source Performance Standards

The State of Florida has adopted the Federal NSPS in their entirety as Part VI, Section 17-2.660 of the DER Regulations. As detailed previously in Section 3.1.1 NSPS is not applicable to this proposed operation pursuant to Subpart Db of the Federal NSPS. Hence, NSPS at the State level is not applicable.

3.2.3 Ambient Air Quality Standards

The State of Florida, under Part III, Section 17-2300, have adopted ambient air quality standards that are equivalent to the NAAQS requirements for TSP, PM-10, Carbon Monoxide, Ozone, and NO_x. The 24-hour and annual standards for SO_2 are lower than those required by the NAAQS. A summary of the Florida Ambient Air Quality Standards for SO_2 are shown in Table 3-5.

TABLE 3-5

FLORIDA DER SULFUR DIOXIDE AMBIENT AIR QUALITY STANDARDS

Pollutant	Type of Standard	Averaging Time	Compliance Frequency Parameter	Concentration	
				ug/m^3	ppm
Sulfur Oxides (as sulfur dioxide)	Primary	24-hour	Annual Maximum	260	0.10
		1-year	Arithmetic Mean	60	0.02
	Secondary	3-hour	Annual Maximum	1,300	0.5

SECTION 4

AIR QUALITY IMPACT ANALYSIS

4.1 Introduction

This section of the application presents the air quality impacts associated with the existing mill and the proposed addition of the No. 5 Package Boiler. The following subsections address:

- The modeling approach used to identify air quality impacts.
- Identification of PSD increment consumption by the project.
- Definition of background air quality.
- Comparison of predicted impacts plus background to NAAQS.
- Identification of additional impacts due to the project.

The only pollutant which will be emitted in quantities greater than the PSD significant emissions levels, as noted in Section 2, is Nitrogen Oxides (NO_x). Hence, based upon discussions and guidance by Florida DER, only NO_x emissions were included in the air quality modeling analysis. The modeling analysis conducted follows the procedures and requirements discussed with Florida DER in our meeting on 16 January 1991. In addition the EPA's "Guideline on Air Quality Models" was followed for the analysis.

In order to quantify the PSD increment consumption by the No. 5 Package Boiler and demonstrate compliance with NAAQS, a refined modeling analysis was conducted that included all existing mill sources as well as the No. 5 Package Boiler. The refined analysis also included other major NO_x sources in the impact area.

4.2 Modeling Approach

The air quality dispersion modeling analysis included both preliminary screening modeling and refined modeling. The screening modeling was used to determine the "worst case" load conditions for the No. 5 Package Boiler. The refined modeling was used to demonstrate compliance with applicable increments and standards.

4.2.1. Land Use Classification

The land use classification for the area was based on discussions with Florida DER at a meeting on 16 January 1991 and a review of land use patterns in the area. The land use analysis conducted followed the Procedures Recommended by EPA and the typing scheme developed by Auer. Based on this analysis and our discussions, the area near the Mill is classified as rural. Therefore, models which incorporate rural dispersion coefficients were used to assess the air quality impact of Mill sources.

4.2.2 Screening Modeling

The EPA SCREEN model was used to determine the "worst case" load conditions associated with operation of the No. 5 Package Boiler. The SCREEN model is an EPA approved UNAMAP VI model. The No. 5 Package Boiler modeling analysis was conducted for three different load conditions: 100%, 75%, and 50%. The appropriate exit velocity, emission rate, and temperature was used for each analysis and are shown in Table 4-1.

Based on the results of the SCREEN modeling analysis the worst case ambient impacts were predicted to occur during the 100% load condition. The results are summarized below and represent the concentrations associated with the corresponding boiler load condition.

Boiler Load Condition	1-hour Impact
100%	404.8 ug/m^3
75%	321.3 ug/m^3
50%	233.2 ug/m^3

Based on the results above, all subsequent refined modeling included the 100% load emission parameters and emission rates for the No. 5 boiler.

4.2.3 Refined Modeling

The modeling procedure used for the refined modeling analysis followed the recommended techniques described in "Guidelines on Air Quality Models (Revised)" July 1986. Based upon this guideline the Industrial Source Complex Long-Term Model (ISCLT) Version dated 89319 was used for the analysis. The ISCLT model is an EPA approved UNAMAP VI model.

The ISCLT model was used to calculate ambient pollutant concentrations for simple (flat) terrain receptors surrounding the Champion facility. Annual concentrations were calculated for nitrogen dioxide. Since the Number 5 stack is less than Good Engineering Practice (GEP) stack height, the ISCLT direction specific downwash option was used in the modeling analysis.

TABLE 4-1

SCREEN EMISSION PARAMETERS
CHAMPION PENSACOLA, FLORIDA NUMBER 5 BOILER

	100% LOAD	75% LOAD	50% LOAD
Stack Height (m)	14.3	14.3	14.3
Stack Diameter (m)	1.22	1.22	1.22
Temperature (°K)	533.0	477.4	463.6
Velocity (m/sec)*	26.28	20.72	10.51
NO_2 (g/sec)	2.46	1.84	1.23

* Velocity is based on flows of 65,000 acfm, 51,250 acfm, and 26,000 acfm, for 100%, 75%, and 50% loads, respectively, based upon actual test data.

In addition to utilizing the direction specific downwash routine, all of the options associated with the "regulatory default" mode were used. These default options are listed below.

- Stack Tip Downwash
- Final Plume Rise
- Buoyancy-Induced Dispersion
- Default Vertical Potential Temperature Gradient
- Default Wind Profile Exponents

A polar receptor grid with discrete receptors along the plant boundary was used in the modeling analysis. Five years of surface data from Pensacola, Florida were used in the analysis. The details of the refined modeling analysis are described in greater detail in the following subsections.

4.2.4 Receptor Grid

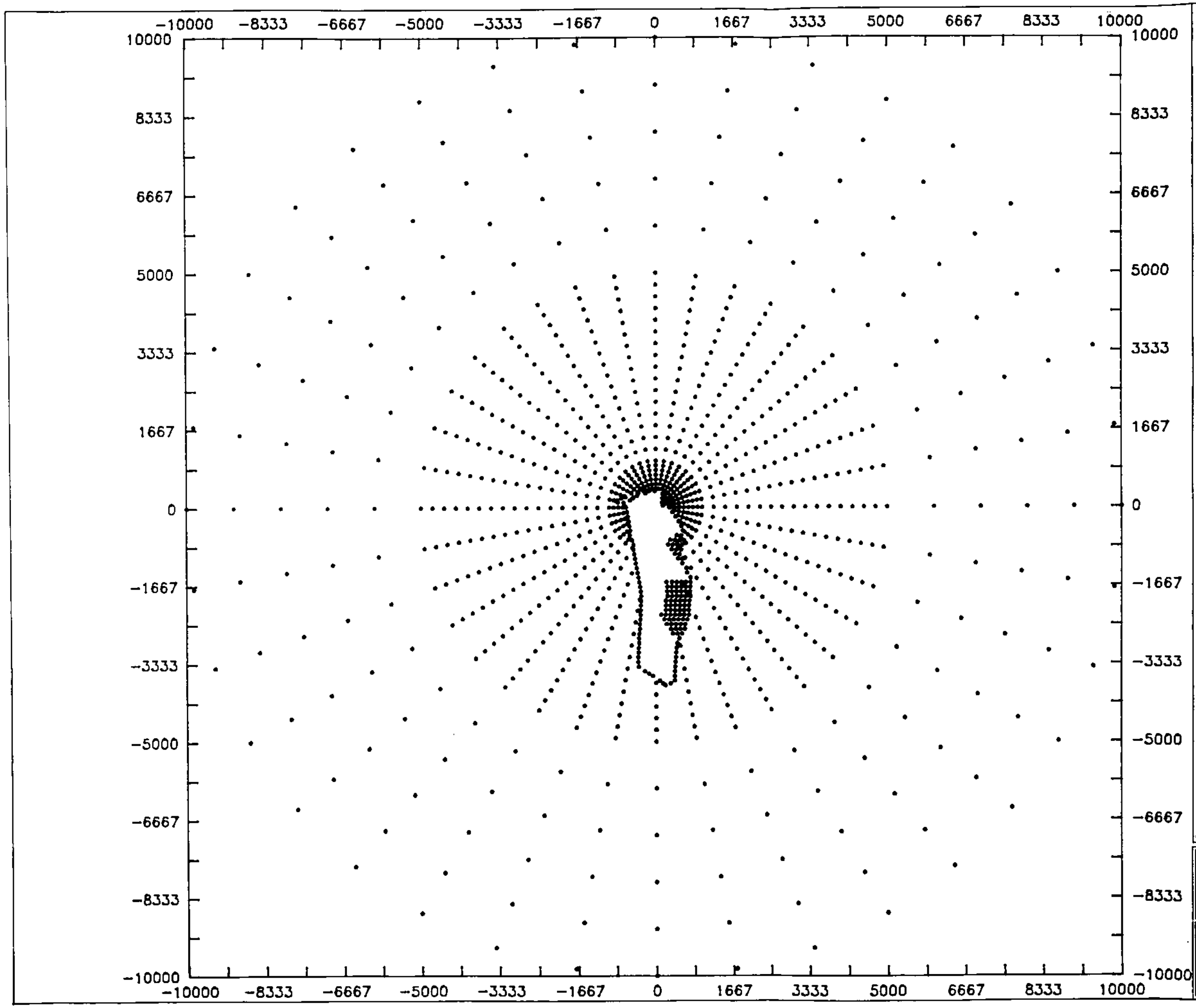
A combination of polar coordinate receptors and rectangular coordinate receptors were established for the ISCLT modeling. As agreed by the Florida DER, no terrain elevations were included for any of the receptors.

Due to the long narrow boundary of Champion's property, an extensive network of discrete receptors was required. Receptors were placed at approximately 100 meter intervals along the perimeter of the facility boundaries. In addition, since the receptor grid was centered on the Number 5 boiler stack, additional discrete receptors were required to adequately fill in the area between the property boundary and the start of the polar grid. These additional reports included points at 100 meter spacing out to 1000m and 250m spacing from 1000m to 4250m where the full polar grid started.

As noted above, the polar grid was centered on the location of the Number 5 boiler stack. The following downwind receptor rings for every 10 degrees of arc from 0° to 360° were included: 4250m, 4500m, 4750m, 5000m, 6000m, 7000m, 8000m, 9000m, and 10,000m. The entire network of receptors is shown in Figure 4-1.

4.2.5 Source Emission Parameters

The emission parameters used for the Number 5 Boiler are shown in Table 4-2. The table includes both physical emission characteristics as well as the gram per second emission rates used in the modeling analysis for NO_x.



SOURCE: MAP DEVELOPED BY WESTON, INC. WEST CHESTER,PA. FROM DATA ANALYSIS

CHAMPENS-HDM-2/91

CHAMPION INTERNATIONAL CORPORATION
PENSACOLA FACILITY
CANTONMENT, ESCAMBIA COUNTY
FLORIDA

FIGURE 4-1
MILL RECEPTOR GRID SYSTEM

TABLE 4-2

SOURCE EMISSION PARAMETERS
NUMBER 5 BOILER
CHAMPION MILL PENSACOLA, FLORIDA

Stack Height (m)	14.30
Stack Diameter (m)	1.22
Temperature (°K)	533.0
Velocity (m/sec)	26.28
NO_2 Emission Rate (g/sec)	2.46

4.2.6 Downwash from Building Wakes

GEP stack height is the minimum height required by a stack in order to always avoid building wake-effect induced downwash. Downwash brings pollutants closer to ground-level at a shorter downwind distance than would be the case for a GEP stack. Thus downwash often causes higher impacts. There are two downwash algorithms which are approved by EPA: Huber Snyder and Schulman-Scire which are defined below.

Huber-Snyder Downwash:

$H_{gep} = H_b + 1.5L$, where

H_{gep} = GEP stack height

H_b = Height of nearby structure

L = Lesser dimension, height or projected width.

Schulman Scire Downwash:

$H_{geps} = H_b + 0.5L$, where

H_{geps} = GEP stack height for Schulman-Scire downwash

H_b = Height of nearby structure

L = Lesser dimension, height or direction specific projected width.

WESTON used the following procedures to analyze the Mill for proper downwash. The Number 5 stack and influencing buildings were first located on a plant map. Figure 2-2 in Section 2 of this application is a diagram of Mill buildings and sources which were used for the analysis. The GEP heights and relevant building dimensions were evaluated by a computer program developed by WESTON. This program incorporates the EPA guideline procedures for determining, in each of the 16 wind directions (22.5° sectors), which building may cause downwash of stack emissions. The program calculations indicated that the Number 5 stack is below the Schulman-Scire critical height and as a result, direction-specific building dimensions were calculated. The results are reproduced in Appendix B. A similar procedure was used to evaluate all other NO_x emission sources at the Mill. Appropriate building dimensions were also developed for each of these other sources for use in the modeling analysis. The results of the analysis for these other sources are also included in Appendix B.

4.2.7 Meteorological Data Base

The meteorological data base used in the modeling analysis included the most recently available five years of representative surface and upper air meteorologic data available. The five year period from 1985-1989 was used in the modeling analysis. Surface data from Pensacola, Florida were used to generate the joint frequency distribution of wind speed direction and stability required for the model (STAR distribution).

4.2.8 Significant Air Quality Impacts

The ISC Model was used with five years of meteorology to determine the significant impact area associated with the No. 5 Boiler NO_x emissions. Based upon this analysis, the significant impact area for the boiler was predicted to be less than 2Km for all five years of meteorology. The highest impacts were predicted to be just off plant property.

4.3 Emissions Inventory

The emissions inventory for NO_x sources has been developed for both Champion Mill sources as well as other major sources in the area. Table 4-3 provides a summary of the emission parameters and emission rates used in the modeling analysis for Champion Mill Sources. Other major NO_x sources to be used in the modeling analysis to demonstrate compliance with PSD increments and National Ambient Air Quality Standards were obtained from Florida DER. In accordance with Florida DER guidance, all major sources in DER's emission data base for Escambia and Santa Rosa counties were evaluated for the modeling analysis. The data provided by DER included potential, allowable, estimated and actual emission rates of NO_x for these additional sources. Not all sources had each of the emission rates identified above. Based on discussions with Florida DER, allowable emissions are based on permit limits. If allowable emission rates were identified, they were used in the modeling analysis. Potential emissions are controlled emission rates which were used if allowable rates were not provided. Estimated emissions which were developed by the department for sources without permit limits were used if potential emission rates were not identified. Finally, actual emission rates were used if estimated emissions were not provided.

A screening procedure suggested by Florida DER's meteorologist was used to eliminate, from the modeling study, small facilities which are not likely to have significant impacts near Champion's Mill. The criteria utilized was based on the distance from the Mill to the facility and the annual emission rates associated with the source being evaluated.

TABLE 4-3
CHAMPION MILL EMISSIONS DATA USED IN THE MODELING ANALYSIS

SOURCE	ISC SOURCE NUMBER	EMISSION RATE (GRAMS/SEC.)	COORDINATE X (METERS)	Y (METERS)	HEIGHT (METERS)	TEMP. (DEG. K)	EXIT VELOCITY (M/SEC.)	DIAMETER (METERS)
NO. 1 POWER BOILER	10	6.6200E+00	-3.3	-37.2	20.42	524.70	16.92	1.98
NO. 2 POWER BOILER	20	1.0710E+01	-9.4	-41.8	20.42	466.30	15.09	1.98
NO. 3 POWER BOILER	30	2.3640E+01	-16.6	-82.8	45.11	335.80	7.62	2.44
NO. 4 POWER BOILER	40	5.8740E+01	37.7	-94.1	67.36	335.20	10.24	3.66
NO. 5 PACKAGE BOILER	50	2.4600E+00	0.0	0	14.30	533.00	26.27	1.22
NO. 1 RECOVERY BOILER	60	1.2600E+01	124.5	-72.6	55.40	516.30	24.38	2.74
NO. 2 RECOVERY BOILER	70	1.2600E+01	103.8	-88.2	55.40	500.00	24.38	2.74
LIME KILN	80	5.6700E+00	81.4	-293.9	41.45	349.60	7.65	1.98
CALCINER	90	1.9300E+00	41.0	-194.7	35.84	346.30	9.17	1.22

In general facilities were eliminated on the following basis:

- Sources with emissions less than 100 tons per year and greater than 5 Km from the Mill.
- Sources with emissions less than 200 tons per year and greater than 10 Km from the Mill.
- Sources with emissions less than 300 tons per year and greater than 15 Km from the Mill.
- Sources with emissions less than 400 tons per year and greater than 20 Km from the Mill.
- Sources with emissions less than 500 tons per year and greater than 25 Km from the Mill.
- Sources with emissions less than 600 tons per year and greater than 30 Km from the Mill.

Table 4-4 identifies facilities which were excluded from the modeling analysis based upon this criteria.

Table 4-5 provides the emission rates and emission parameters for all other major sources included in the air quality modeling analysis. For sources with similar emission parameters, a representative source was identified and all emissions from the similar sources were summed and assumed to be emitted from the representative stack. Table 4-6 identifies the sources which were grouped into a representative stack for modeling purposes. The ISC model representative stack number used in the modeling analysis is also shown in the table.

4.4 PSD Increment Analysis

Based on a review of data provided by Florida DER, the only NO_x PSD increment consuming source in the vicinity of the Champion Mill is the proposed No. 5 Power Boiler. Table 4-7 provides the annual NO_x increment consumption due to this source for the five year air quality modeling analysis. As shown in the table, less than 20% of the annual PSD increment is consumed by the proposed source. Hence, the facility will neither cause nor contribute to an exceedance of the Federal PSD increment for nitrogen dioxide. It should also be noted that the maximum predicted annual impact for the No. 5 Package Boiler is less than the PSD monitoring exemption de-minimis concentration of 14 ug/m^3, annual average. Therefore, pre-construction monitoring is not required for this source.

4.5 National Ambient Air Quality Standards Demonstration

The National Ambient Air Quality Standards (NAAQS) Demonstration was based on modeling all sources of nitrogen oxide emissions from

TABLE 4-4

FACILITIES EXCLUDED FROM THE NAAQS ANALYSIS

	Sources Eliminated from NO_x Modeling in Santa Rosa and Escambia County, Florida		
	Total Facility NO_x Emissions (ton/year)	Distance from Champion Mill (km*)	20 "D" exclusion (tons/year)
Coastal Fuels	5.20	21.0	420
Escambia County Utilities	42.0	21.3	406
Puritan-Bennett	1.48	2.9	58
Reichhold Chemicals	75.81	19.6	392
Armstrong World Industries	3.22	19.5	390
Exxon @ McLellan Field	85.18	58.3	1166
Petro Acquisitions	23.0	29.2	584
Exxon @ Santa Rosa	139.0	39.1	782

* Note: Distance from Mill is calculated based on the distance from the significant impact area for the Number 5 Boiler which is a Circle 4 Km in diameter from the No. 5 Boiler Stack.

TABLE 4-5
OTHER MAJOR NOx SOURCES USED IN THE MODELING ANALYSIS

SOURCE	ISC SOURCE NUMBER	EMISSION RATE (GRAMS/SEC.)	COORDINATE		HEIGHT (METERS)	TEMP. (DEG. K)	EXIT VELCOITY (M/SEC.)	DIAMETER (METERS)
			X (METERS)	Y (METERS)				
AMERICAN CYANAMID	301	1.9300E-01	20200	-5800	15.24	544.00	15.54	1.37
	302	2.1040E+00	20200	-5800	15.24	477.00	9.14	1.68
	303	1.1329E+01	20200	-5800	15.24	436.00	14.32	1.46
	309	8.9650E+00	20200	-5800	15.24	450.00	10.06	1.92
AIR PRODUCTS CHEMICALS	401	1.9310E+00	18000	-2600	12.50	394.00	7.92	12.5
	402	6.9480E+00	18000	-2600	12.50	650.00	10.67	1.43
	404	1.4400E+00	18000	-2600	7.62	477.00	0.61	0.24
	408	3.8860E+00	18000	-2600	24.99	505.00	29.57	1.13
	410	5.6410E+00	18000	-2600	27.43	436.00	39.32	2.29
	411	2.3494E+01	18000	-2600	7.62	450.00	19.04	0.76
	422	2.6230E+00	18000	-2600	21.64	450.00	29.87	0.91
	423	3.9200E+00	18000	-2600	28.65	444.00	30.78	0.76
	426	2.0554E+01	18000	-2600	6.10	755.00	41.18	0.52
EXXON AT ST. REGIS	510	6.0500E-01	13800	39600	15.24	422.00	32.31	0.61
	515	6.4400E+00	13800	39600	12.19	719.00	24.69	1.68
	516	2.2918E+01	13800	39600	6.10	616.00	24.69	0.3
	518	6.9190E+00	13800	39600	10.67	496.00	25.51	2.65
	519	1.2511E+01	13800	39600	9.14	616.00	7.86	0.91
	514	1.2970E+00	13800	39600	12.19	452.00	17.37	0.76
MONSANTO CHEMICAL	4002	6.0250E+00	7000	-1000	18.29	497.00	28.65	1.22
	4003	1.4500E+01	7000	-1000	38.10	383.00	10.36	3.66
	4005	2.3150E+00	7000	-1000	38.10	613.00	5.49	0.82
	4012	6.1000E-02	7000	-1000	21.34	1033.00	1.52	0.24
	4014	5.2750E+00	7000	-1000	45.72	455.00	10.67	3.05
	4042	1.5783E+01	7000	-1000	36.58	429.00	34.14	1.37
	4049	4.6100E-01	7000	-1000	27.43	474.00	14.02	1.46
	4053	8.6000E-02	7000	-1000	18.29	1089.00	1.22	0.91
	4067	1.1500E-01	7000	-1000	9.14	1089.00	3.96	0.3
GULF POWER CO.	4501	1.8841E+02	9500	-4600	137.16	416.00	15.85	5.49
	4506	1.0149E+03	9500	-4600	137.16	405.00	29.57	7.07
PENSACOLA CHRISTIAN COLLEGE	11401	1.2850E+01	8500	-15000	2.29	884.00	22.41	0.33

TABLE 4-6

COMBINED LOCAL SOURCES FOR SANTA ROSA AND ESCAMBIA COUNTY, FLORIDA FACILITIES

Facility Id	Source #	Emission Rate g/sec	Stack Height m	Temperature •K	Velocity m/sec	Stack Diameter m	Representative ISC Source #
American Cyanamid	303	6.515	15.24	436	14.63	1.46	303
	304	4.814	15.24	436	14.32	1.46	303
Air Products Chemicals	402	3.430	12.50	650	10.97	1.43	402
	403	3.518	12.19	672	10.67	1.52	402
	404	1.127	8.84	477	1.83	1.07	404
	405	0.011	13.72	1,144	3.66	0.24	404
	406	0.106	7.62	565	0.61	0.24	404
	407	0.199	7.62	977	0.61	0.85	404
	408	1.939	24.99	505	29.57	1.13	408
	425	1.927	24.99	505	29.65	1.13	408
Exxon St. Regis	510	0.201	15.24	422	32.31	0.61	510
	511	0.201	15.24	422	32.31	0.61	510
	512	0.201	15.24	422	32.31	0.61	510
	516	0.086	6.10	616	24.69	0.30	516
	517	22.784	6.10	616	24.69	0.30	516
Monsanto Chemical	4,003	8.199	38.10	383	10.36	3.66	4,003
	4,004	6.271	38.10	383	10.36	3.66	4,003
	4,005	1.007	38.10	613	5.49	0.82	4,005
	4,007	0.135	38.10	613	5.49	0.82	4,005
	4,008	0.135	38.10	613	5.49	0.82	4,005
	4,009	0.187	38.10	613	5.49	0.82	4,005
	4,010	0.187	38.10	613	5.49	0.82	4,005
	4,011	0.187	38.10	613	5.49	0.82	4,005
	4,013	0.472	38.10	428	8.53	0.82	4,005
	4,014	2.963	45.72	455	10.67	3.05	4,014
	4,015	0.777	45.72	455	10.67	3.05	4,014
	4,016	1.525	45.72	455	10.67	3.05	4,014
	4,053	0.029	18.29	1,144	1.22	1.01	4,053
	4,054	0.058	18.29	1,089	6.40	0.91	4,053

TABLE 4-6 Continued

COMBINED LOCAL SOURCES FOR SANTA ROSA AND ESCAMBIA COUNTY, FLORIDA FACILITIES

Facility ID	Source #	Emission Rate g/sec	Stack Height m	Temperature •K	Velocity m/sec	Stack Diameter m	Representative ISC Source #
Gulf Power Co.	4,501	18.005	137.16	416	15.85	5.49	4,501
	4,502	18.005	137.16	416	15.85	5.49	4,501
	4,503	30.959	137.16	416	15.85	5.49	4,501
	4,504	60.443	137.16	416	15.85	5.49	4,501
	4,505	60.607	137.16	416	15.85	5.49	4,501
	4,506	371.107	137.16	405	29.57	7.07	4,506
	4,507	641.717	137.16	405	29.57	7.07	4,506
Pensacola Christian College	11,401	4.28	2.29	884	22.41	0.33	11,401
	11,402	4.28	2.29	884	22.41	0.33	11,401
	11,403	4.28	2.29	884	22.41	0.33	11,401

TABLE 4-7

PSD INCREMENT CONSUMPTION BY THE PROPOSED NO. 5 PACKAGE BOILER AT CHAMPION'S CANTONMENT MILL

	1985	1986	1987	1988	1989
Impact (ug/m^3)	3.88	4.25	4.55	4.26	4.89
Receptor (x, y)(m)	(153.2, 128.6)	(150, 40)	(150, 40)	(153.2, 128.6)	(153.2, 128.6)
% of PSD Increment	16%	17%	18%	17%	20%

the Mill in combination with other major sources of nitrogen oxides in the area (Table 4-5 sources). In addition, a background concentration from nearby monitors which represents distant source plus uninventoried source impacts, was added to the modeled concentration. This conservative approach does not account for the impact of major sources, included in the modeling analysis, on the monitored values used. Hence, the demonstration is likely to over-predict the actual air quality impacts in the area.

4.5.1 Background Nitrogen Dioxide

Data on the background concentration to be used in the ambient air quality analysis was provided by the Florida DER. The state has no SLAMS data for nitrogen oxides currently being collected in the Pensacola or Cantonment, Florida areas. Data was collected at a site in Escambia County near Pensacola in 1982-1985. This site (3540004F01) was located at the Ellyson Industrial Park in northern Pensacola. Concentrations measured at this site were:

	Annual Average Concentration		
	1982	1983	1984
Nitrogen Dioxide (ug/m^3)	13	14	21

In addition, data has been collected by Gulf Power Company for 1990 at two stations (CRIST #4 Brunson, CRIST #2 Monsanto). The annual average concentrations measured at these stations was 19 ug/m^3 and 10 ug/m^3, respectively. Based on these data and the previous data collected by Florida DER, a conservative background concentration would be 21 ug/m^3. Florida DER also provided data for a site in Jacksville, Florida. This site is located at Kooker Park (Site No. 1960-032H02) in Jacksonville. The annual average background concentration measured at this site in 1990 was 28 ug/m^3. Florida DER has requested that this value be used as an extremely conservative regional background concentration for the NAAQS demonstration.

4.5.2 NAAQS Modeling Results

The results of the modeling analysis for all major sources in the area in combination with Champion Mill sources including the No. 5 Boiler are shown in Table 4-8 for the five years of modeling. Also shown in the table is the conservative background air quality level identified by Florida DER. The maximum annual combined impact (modeled sources plus background) is 99.78 ug/m^3. If the conservative concentration based on the data collected in Pensacola is used (21 ug/m^3) the maximum predicted annual concentration is 92.78 ug/m^3. Therefore, based upon either of the conservative analyses conducted, the No. 5 Boiler will neither cause nor contribute to an exceedance of the NAAQS for nitrogen dioxide.

TABLE 4-8

COMPARISON OF MAJOR SOURCE IMPACTS PLUS BACKGROUND TO NAAQS

	Concentration ug/m^3				
	1985	1986	1987	1988	1989
Major Sources Impact	62.23	65.05	62.32	62.49	71.78
Background Concentration	28	28	28	28	28
Total Impact	90.23	93.05	90.32	90.49	99.78
NAAQS	100	100	100	100	100

4.6 Impact on Growth, Visibility, Soils and Vegetation

PSD regulations require that an analysis be conducted to determine whether any impairment to visibility and other adverse impacts on soils and vegetation in the vicinity of the source would occur. Specifically, five areas have been examined: associated growth, visibility, acidification of rainfall, soils, and vegetation. The proposed No. 5 Boiler should not cause these impacts; however, it is important to recognize their potential existence.

4.6.1 Associated Growth

It is estimated that the No. 5 Boiler will not require any additional staff. Thus, there will be no perceptible negative growth impacts resulting from the project.

4.6.2 Visibility

Pollutants responsible for visibility reduction are classified into three major groups:

- Hygroscopic particulates.
- Opaque agglomerates (e.g., carbon, metal particulate).
- Transparent crystals (e.g., silicon, calcium).

The No. 5 boiler is estimated to emit less than 5 tons per year of particulate matter and less than 0.1 tons of sulfur dioxide. Hence, it is not anticipated that any perceptible reduction in visibility will occur due to the emission of primary or secondary aerosols by the proposed boiler project.

Nitrogen dioxide absorbs light energy over the entire visible spectrum, although primarily in the shorter, blue wave length regions; thus, nitrogen dioxide can by itself reduce visibility. In addition, visibility reducing aerosols are formed by photochemical processes involving oxides of nitrogen and hydrocarbons. However, the concentration of nitrogen oxides (in the form of nitrogen dioxide) caused by the proposed No. 5 Boiler is sufficiently low (less than 5 ug/m^3 on an annual average basis) that significant impairment of visibility is not expected to occur.

4.6.3 Acidification of Rainfall

Sulfuric acid may be formed in the natural atmospheric removal process associated with sulfur dioxide. Acidity levels of precipitation can be increased with this addition of hydrogen ions and potentially may have an adverse impact on biotic communities.

As previously indicated, the emission rate of SO_2 from the proposed project is estimated to be less than 0.1 tons per year. At these low emission rates, no significant degree of rainfall acidification is anticipated due to the proposed boiler project.

4.6.4 Soils

Operation of the facility must be addressed to determine the impacts of its emissions on soils in the nearby vicinity by such mechanisms as (1) dry deposition of emitted particulate; (2) washout deposition of particulate and water soluble gases; (3) dry reaction of gaseous compounds to the soil via metabolic incorporation into plant root systems; and (5) deposition of combustion particulate.

It is extremely difficult to quantify any of the potential impacts delineated above. However, at the low estimated emission rates for the proposed boiler, adverse impacts are unlikely.

Atmospheric washout will remove some particulate, SO_2, and NO_2. The amounts removed and initially deposited on the soil will be quite small in comparison to deposition due to emissions or sources in urban areas. It is doubtful that the pH of the rainfall in the region will be measurably lowered. Some field experiments at other locations using simulated rainfall at a pH of as low as 4 have shown only small effects on soil chemical properties. These same studies have shown that forested areas absorbed much of the deposited nitrogen and benefitted therefrom.[1]

Dry deposition acts continuously to reduce atmospheric concentrations of SO_2 by chemical reaction and adsorption by vegetation. Although rainfall is much more efficient at removing SO_2, dry deposition and reaction are probably responsible for removing twice as much atmospheric sulfur.[2] The small amount of SO_2 available for reaction (from the proposed boiler) will not result in any significant chemical alteration of the regional soils, and some of that which does react will be removed by subsequent rainfall.

NO_2, on the other hand, is dry deposited to a significant degree only after further atmospheric oxidation. Its atmospheric life is therefore longer than that of SO_2, and longer life means greater dispersion. When deposited, it is rapidly consumed by vegetation which increases its likelihood of eventually reacting with soils.[3] Its chemical impact on the soils,however, will likely be even less than that for SO_2 because that which is emitted is dispersed to greater distances.

4.6.5 Vegetation

The emission of common atmospheric pollutants such as SO_2, and NO_2, has the potential to cause damage to vegetation.[4] Operation of the proposed boiler must be addressed to determine if it has a potential impact on vegetation.

The sensitivity of vegetation to air pollution injury varies greatly with such factors as plant species and variety, climatic and seasonal conditions, soil composition, and the nature or combinations of pollutants.[5] In general, plants tend to be more susceptible to damage during spring and summer growing seasons and when exposed to short-term high concentrations as opposed to continuous lower levels of pollution.[6]

A summary of research on air pollution effects on vegetation divides air pollution injuries to plants into three general categories: acute, chronic, and subtle.[7] Acute injury is caused by exposure to a high concentration of a deleterious substance resulting in rapid visible death of some tissue. Chronic injury is caused by long-term exposure to low pollutant levels which gradually disrupts physiological processes and retards growth or yield.

Long-term subtle effects on vegetation are difficult to define and little is known to date as to the threshold concentrations and exposure times which may cause damage. The following paragraphs will, therefore, focus on acute injuries for which exposures and effects are known. The possibility exists, however, that subtle impacts may occur at levels not presently known to cause injury.

SO_2 will be emitted at very low levels resulting in a minimal SO_2 loading to the atmosphere. Hence, emissions of SO_2 from the facility are not expected to have an adverse impact on vegetation.

Potential NO_2 damage to vegetation in the area is also unlikely. In general, acute NO_2 damage to vegetation is not likely to occur at levels found outdoors although some reduction in growth might occur at continuous levels of 200 - 500 ug/m^3. Sensitive species may be damaged by 4-hour concentrations of 3800 - 13,3000 ug/m^3. Soybeans are considered to have intermediate sensitivity (4-hour injury threshold of 9,400 - 18,800 ug/m^3), while corn is rated as resistant (4-hold injury threshold of 16,900 ug/m^3). In view of the current background NO_2 levels and the small increase anticipated as a result of operation of the proposed boiler, no adverse effects on vegetation are expected to occur.

REFERENCES

[1] R. A. Barnes, "The Long Range Transport of Air Pollution" in Journal of the Air Pollution Control Association, Volume 29, Number 12, December, 1979.

[2] Ibid

[3] Ibid

[4] George H. Hepting, "Air Pollution and Trees" in Man's Impact on Terrestrial and Oceanic Ecosystems, Matthews, Smith, and Goldberg, Editors, MIT Press, 1974.

[5] H. E. Heggest ad, "Air Pollution and Plants" in Matthews, et al., 1974.

[6] Wisconsin Public Service Corporation, "Air Pollution Effects on the Terrestrial Environment," Section 4.7.7.2 of Weston Generating Station Unit 3 Environmental Report, Vol. 2, 1975.

[7] Ibid

SECTION 5

DETERMINATION OF BEST AVAILABLE CONTROL TECHNOLOGY

5.1 Introduction

The BACT determination for the package boiler follows recent EPA guidance that recommends a "top-down" approach.[1,2] The approach is to determine, for the emission source under consideration, the most effective control technique available for a similar or identical source or source category. If it can be demonstrated that the control technique which is most effective in reducing emissions of the pollutant under consideration is infeasible due to technical, economic, or energy impacts or is environmentally unacceptable for the source in question, then the next most stringent level of control is determined and similarly evaluated. The BACT evaluation process continues until the level of control under consideration cannot be eliminated by any material or unique technical, economic, energy, or environmental considerations.

Best Available Control Technology is specifically defined in 40 CFR 52.21 (b)(12) as:

> "An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61. If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice, or operation, and shall provide for compliance by means which achieve equivalent results".

The methodology used in this study to determine BACT follows the "top-down" approach presently recommended by the EPA and contains the following elements:

- Determination of the most stringent control alternatives potentially available.
- Discussion of the technical and economic feasibility of each alternative.
- Assessment of energy and environmental impacts.
- Selection of the most stringent control alternative that is technically and economically feasible and that provides the best overall control of all pollutants.

The selected BACT must be at least as stringent as NSPS and State Implementation Plan limits for the source.

The only pollutant from the package boiler that is projected to exceed PSD significant emission rates is NO_x.

As part of the BACT determination for NO_x, an extensive review was made of current and proposed technologies applicable to various types of combustion sources, including boilers and gas turbines. The BACT/LAER Clearinghouse - A Compilation of Control Technology Determinations was reviewed from the 1985 edition to the current supplement and the BACT/LAER Information System database was searched for relevant entries from January, 1989 to December, 1990. Various U.S. EPA and state agency officials involved in similar determinations were also contacted to ascertain BACT for NO_x control.

5.2 Identification of Available Control Technologies for NO_x

Nitrogen oxides are products of all conventional combustion processes. Nitric oxide (NO) is the predominant form of NO_x produced with lesser amounts of nitrogen dioxide (NO_2) and nitrous oxide (N_2O). The NO can further oxidize in the atmosphere to NO_2. The aforementioned nitrogen oxides are referred to collectively as NO_x. The generation of NO_x from fuel combustion is a result of two formation mechanisms. Fuel NO_x is formed by reaction of the chemically bound nitrogen in the fuel and oxygen in the combustion air at high temperature in the combustion zone. Thermal NO_x is produced by the reaction of molecular nitrogen and oxygen contained in the combustion air at high temperature in the combustion zone. The main factors influencing the NO_x reaction are combustion temperature, residence time within the combustion zone, amount of fuel-bound nitrogen, and oxygen levels present in the combustion zone. Since the package boiler is fueled with natural gas which is inherently low in fuel-bound nitrogen, only thermal NO_x formation is important.

A number of control techniques have been used to reduce NO_x emissions from combustion processes. Selective catalytic reduction of NO_x by ammonia (NH_3) was identified as the most stringent method of NO_x control for certain combustion processes because of the relatively high removal efficiencies that can be achieved under proper operating conditions. Selective catalytic reduction is an add-on control most commonly used in the United States on gas-fired industrial and utility boilers and combustion turbines. Relatively high NO_x removal efficiencies approaching 90 percent can be obtained with selective catalytic reduction. Flue gas denitrification (FGDN) is another add-on NO_x control technology that also approaches 90 percent removal efficiencies by using a wet scrubbing method.

Selective noncatalytic reduction was the next most stringent control technology identified. It is also an add-on control technology that utilizes ammonia, urea, or other reducing compounds without a catalyst present. Selective noncatalytic reduction is normally capable of attaining NO_x removal efficiencies in the range of 35 to 55 percent.

Combustion modification techniques, such as low NO_x burners, combustion controls, and flue gas recirculation can also be used to reduce NO_x emissions from natural gas firing by limiting thermal NO_x formation. Such techniques limit excess air and reduce peak flame temperatures and are more aptly described as process modifications rather than add-on (post-combustion) controls. The aforementioned technologies are generally capable of reducing NO_x emissions by up to 50 percent compared to a combustion unit without such controls.

5.2.1 Selective Catalytic Reduction (SCR)

In the selective catalytic reduction (SCR) process, NO_x is reduced to N_2 and H_2O by ammonia (NH_3) within a temperature range of approximately 540-840^oF in the presence of a catalyst, usually a base metal. The lower end of the operating temperature range is feasible when the acid gas impurity level is relatively low. NH_3 has been used as an acceptable reducing agent for NO_x in combustion gases because it selectively reacts with NO_x while other reducing agents such as H_2, CO, and CH_4 also readily react with O_2 in the gases. In a typical configuration, flue gas from the combustion source is passed through a reactor which contains the catalyst bed. Parallel flow catalyst beds may be used in which the combustion exhaust gas flows through channels rather than pores to minimize blinding of the catalyst by particulate matter. Ammonia in vapor phase is injected into the flue gas upstream of the control equipment that may be required for the particular combustion process for removal of remaining pollutants such as particulate matter and sulfur dioxide. The ammonia is normally injected at a 1:1 molar ratio based upon the NO_x concentration in the flue gas. Major capital equipment for SCR consists of the reactor and catalyst, ammonia storage tanks, and an ammonia injection system using either compressed air or steam as a carrier gas. Because of the toxic characteristics of NH_3, appropriate storage and handling safety features must be provided. NO_x removal efficiencies approaching 90 percent have been reported when using SCR systems for boiler and gas turbine applications.

Table 5-1 lists the total capital investment for an SCR system based upon information received from Engelhard for treatment of a 13,000 scfm gas stream. Basic equipment cost was then scaled up using the six-tenths factor rule based upon the 35,900 scfm flue gas flow rate from the Champion package boiler. Total purchased equipment cost, direct installation costs, and indirect costs were based upon factors given in the U.S. EPA OAQPS Control Cost Manual.[3] Ammonia handling and safety design costs were scaled down from an estimate for a resource recovery facility based upon the facility NO_x consumption rates (which are directly proportional to NH_3 consumption rates) and the six-tenths factor rule. Annualized cost information is presented in Table 5-2 based upon direct and indirect operating cost factors given in the OAQPS Control Cost Manual for other types of control equipment. Operating costs include a cost for natural gas reheat of the boiler exhaust gas from the 400°F discharge temperature to the 540°F lower limit of the SCR operating temperature range. Catalyst replacement cost was based upon a three year life not given in the vendor warranty. Cost effectiveness was calculated based upon a NO_x inlet emission rate of 85.4 tons per year to the SCR system and a vendor estimated removal efficiency of 85.5 percent. A baseline emission rate of 85.4 tons per year was used (0.1 lb/MM Btu @ 195 MM Btu/hr) since the package boiler is an existing unit that is already integrally equipped with low NO_x burners and flue gas recirculation. The calculated cost effectiveness of more than $8,000 per ton of NO_x removed is higher than any guidelines provided by the U.S. EPA. A recent order by the U.S. EPA Administrator in reviewing a PSD Appeal implied that a cost as high as $6,500 per ton of NO_x removed can be considered cost effective when making a BACT determination.[4] However, the basis for this value was apparently related to a permit that was issued to a non-PSD source which was never constructed. Consequently, it is not a valid benchmark for NO_x cost effectiveness, and irregardless is less than the cost effectiveness calculated for SCR.

Hence, based upon the analysis given above, SCR is discounted as BACT for NO_x control on the package boiler.

5.2.2 Flue Gas Denitrification (FGDN)

Flue gas denitrification (FGDN) systems use wet scrubbing technology to react absorbed SO_2 with NO_x to form molecular nitrogen and can achieve NO_x removal efficiencies approaching 90 percent. Consequently, FGDN systems are designed for combustion

Table 5-1
Champion Package Boiler
Capital Costs for NOx Control
Engelhard SCR System

Vendor Quote:	1.15 *(A)*		**$827,758**	*(1)*
Purchased Equipment Cost:				
Control device and auxilary equipment	1.00 *(A)(2)*		$719,800	*(A)*
Instruments and controls	0.10 *(A)*	x 1.5 (for CEM, feedback)(3)	$108,000	
Taxes	0.03 *(A)*		$21,600	
Freight	0.05 *(A)*		$36,000	
Total purchased equipment cost :			$885,400	*(B)*
Direct Installation Cost:				
Foundations and supports	0.08 *(B)*		$70,800	
Erection and handling	0.14 *(B)*		$124,000	
Electrical	0.04 *(B)*		$35,400	
Piping	0.02 *(B)*		$17,700	
Insulation	0.01 *(B)*		$8,900	
Painting	0.01 *(B)*		$8,900	
Total direct installation costs:			$265,700	
Total direct costs:			$1,151,100	
Indirect Costs:				
Engineering and supervision	0.10 *(B)*		$88,500	
Construction and field expenses	0.05 *(B)*		$44,300	
Construction fee	0.10 *(B)*		$88,500	
Startup	0.02 *(B)*		$17,700	
Performance test	0.01 *(B)*		$8,900	
Contingencies	0.03 *(B)*		$26,600	
Total indirect costs:			$274,500	
Ammonia Handling & Safety Design Cost (4) =	$300,000	x (0.5 x 85.4 tons/year of NOx / 455.2 tons/year of NOx)^0.6	$72,500	
Total Installed Capital Costs :			$1,498,100	

(1) Based on a July, 1990 vendor cost estimate ($450,000 for 13,000 scfm) that includes auxiliary equipment, instruments and controls. Six-tenth factor scaleup was used based on 13,000 scfm quote basis vs. 35,900 scfm package boiler flue gas flow rate.

(2) Factors in this column taken from U.S. EPA OAQPS Control Cost Manual, EPA 450/3-90-006A, January 1990 for thermal and catalytic incinerators, and carbon adsorbers.

(3) Multiplier from Capital and Operating Costs of Selected Air Pollution Control Systems, EPA 450/5-80-002, December 1978 (GARD Manual).

(4) Scaled down from cost estimate for the Pennsauken Resource Recovery Project BACT Assessment for Control of NOx Emissions Top-Down Technology Consideration. Ogden Martin Systems of Pennsauken, Inc., Dec.15, 1988, adjusted to current $ and reflecting half the NH3 consumption of Exxon DeNOx.

Table 5-2
Champion Package Boiler
Annualized Costs for NOx Control
Engelhard SCR System

Cost item	Computation method	Cost, dollars
<u>Direct operating costs</u>		
Operating Labor		
Operator	$12.96 /hr x 3 shifts/day x 0.5 hrs/shift x 365 days/yr	$7,096
Supervision	15% of operator labor cost	$1,064
Maintenance (general)		
Labor	$14.26 /hr x 3 shifts/day x 0.5 hrs/shift x 365 days/yr	$7,807
Materials	100% of maintenance labor	$7,807
Utilities		
Electricity	$0.0590 /kWh x 98,119 kWh/yr	$5,789
Gas	$3.300 /M ft.^3 x 52,735 M ft^3/yr	$174,026
Ammonia	$350.000 /ton x 31.6 tons/yr	$11,046
Total Direct Operating Costs (A)	**Subtotal of above**	**$214,600 *(A)***
<u>Indirect operating (fixed) costs</u>		
Overhead	60% of operating and maintenance labor & materials $23,775	$14,265
Property Tax	1% of total installed capital costs, $1,498,100	$14,981
Insurance	1% of total installed capital costs, $1,498,100	$14,981
Administration	2% of total installed capital costs, $1,498,100	$29,962
Capital Recovery	<u>SCR Unit</u> CRF, 0.1627 x (total installed capital costs - catalyst costs) (catalyst costs = $259,440 x 1.08 (including taxes & freight)) (at 10% interest & 10 years)	$198,208
	<u>Catalyst</u> CRF, 0.4021 x (catalyst costs = $259440) (at 10% interest & 3 years)	$104,325
Total Fixed Costs (B)	**Subtotal of above**	**$376,700 *(B)***
Total Annualized Costs (C)	**(A+B)**	**$591,300 *(C)***

<u>Cost Effectiveness</u>			
	NOx Emissions (TPY)	**85.40**	
	NOx Removal, %	**85.5**	
	Cost, $/ton NOx Removed		**$8,100**

sources that burn relatively high sulfur fuel. However, since the package boiler under consideration is fired with essentially sulfur-free natural gas fuel, there is no source of SO_2 for absorption into the scrubbing liquid. Thus, FGDN is dismissed as BACT for NO_x control on the package boiler because of technical infeasibility.

5.2.3 Selective Noncatalytic Reduction (SNCR)

Selective non-catalytic reduction (SNCR) involves ammonia or urea injection, but not in the presence of a catalyst. Two major SNCR systems are commercially available: the Exxon Thermal $DeNO_x$ ammonia injection system and the Nalco Fuel Tech NO_xOUT urea injection system. A third system, the Noell (formerly the Emcotek) Two-Stage $DeNO_x$ urea/methanol injection system, has undergone extensive pilot testing and a full scale demonstration on one MSW incinerator line in Switzerland.

5.2.3.1 Exxon Thermal $DeNO_x$

Exxon Thermal $DeNO_x$ ammonia injection, like SCR, uses the NO_x/ammonia reaction to convert NO_x to molecular nitrogen. However, without catalyst use or supplemental hydrogen injection, NO_x reduction reaction temperatures must be tightly controlled between 1,600 and 2,200°F (between 1600 and 1800°F, for higher efficiency).[5] Below 1,600°F and without hydrogen also being injected, ammonia will not fully react, resulting in what is called ammonia breakthrough or slip. If the temperature rises above 1,800°F, a competing reaction begins to predominate:

$$NH_3 + \frac{5}{4} O_2 \text{ ---> } NO + \frac{3}{2} H_2O$$

As indicated above, this reaction increases NO emissions. Therefore, the region within the boiler where ammonia is injected must be carefully selected to ensure the optimum reduction reaction temperature will be maintained.

Thermal $DeNO_x$ is an available technology that has been used on gas-fired boilers and gas turbines and commonly achieves NO_x removals up to 50 to 60% within the narrow temperature range noted previously. However, since ammonia is injected at a 2:1 molar ratio based upon the flue gas NO_x concentration, there is generally some "slip" of ammonia which does not react completely and that can potentially cause odors. In addition, ammonia is now considered a hazardous air pollutant pursuant to the recent Clean Air Act amendments. At the package boiler flue gas flow rate of 35,900 scfm and a "slip" concentration of 20 ppmv, ammonia emissions could amount to 8 tons per year.

Tables 5-3 and 5-4 summarize capital costs and annualized costs respectively, for an Exxon Thermal DeNO$_x$ SNCR system installed on the Champion boiler. It was assumed that the ammonia injection would occur within the boiler configuration at a point where the combustion gases are maintained in a temperature range of 1,600 to 1,800°F. Table 5-3 details the total capital investment for an Exxon Thermal DeNO$_x$ system based upon information given in an Exxon study that evaluates the technology. Basic equipment cost was derived from direct cost information provided by Exxon for treatment of a 47,100 scfm flue gas stream. The Exxon direct cost information was scaled down using the six-tenths factor rule based upon the 35,900 scfm flue gas flow rate from the Champion package boiler and adjusted to current dollars using the Chemical Engineering cost adjustment factor for heat exchangers and tanks. Then total purchased equipment cost, direct installation costs, and indirect costs were based upon factors given in the OAQPS Control Cost Manual for other types of control equipment as indicated in Table 5-3. As with the SCR capital cost analysis, ammonia handling safety design costs were scaled down from an estimate for a resource recovery facility based upon the facility uncontrolled NO$_x$ emission rates and the six-tenths factor rule.

Annualized cost information is presented in Table 5-4 based upon direct and indirect operating cost factors as suggested in the OAQPS Control Cost Manual. Compressed air was assumed to be the NH$_3$ carrier gas although steam could also be used. Premised upon a baseline NO$_x$ emission rate of 85.4 tons per year, cost effectiveness was calculated over a range of expected NO$_x$ removal efficiencies from 35 to 55 percent. The cost effectiveness for that range of removal efficiencies varies from $11,700 to $7,500 per ton of NO$_x$ removed.

Having accounted for economic and energy considerations in the cost analysis above, it can be seen that Exxon Thermal DeNO$_x$ is not cost effective based upon the same reasoning given in the previous discussion for SCR. Furthermore, the comparatively low baseline NO$_x$ emission rate of 85.4 tons per year would yield only a 47 ton per year decrease in NO$_x$ emissions at a removal efficiency of 55 percent while potentially creating 8 tons per year of NH$_3$ emissions. Therefore, Exxon Thermal DeNO$_x$ is not viable as BACT for the Champion package boiler.

5.2.3.2 Nalco Fuel Tech NO$_x$Out

The Electric Power Research Institute (EPRI) discovered and patented the chemical process of using urea ($CO(NH_2)_2$) to convert nitrogen oxides to nitrogen and water. This process of urea injection has been further developed and is being marketed by Nalco Fuel Tech, Inc. as the NO$_x$OUT process. In routine applications, liquid urea and proprietary enhancers (oxygenated hydrocarbons) are mixed with water and pumped into the flue gas as an aqueous solution. Atomization at injection nozzles is assisted by

Table 5-3
Capital Costs for Exxon Thermal DeNOx for the Champion Package Boiler

			Included in Exxon cost		
Boiler Exhaust Flow Rate (scfm) =	**35,900**	**Normal Heat Input Per Train (MM BTU/Hr)=**	**195**		
Direct Costs: From Exxon Paper =	**$190,000**	**x (package boiler flue gas flowrate - 35900 scfm) / (boiler flue gas flowrate based on paper - 47100 scfm)^0.6 x C.E. Heat Exhangers & Tanks Eq. Factor (Oct. '90 - 371.5 / Dec. '86 - 312.5) =**		**$191,900**	
Purchased Equipment Cost:					
Control device and auxillary equipment (tank, vaporizer, etc)			1.0	$128,800	*(A)(1)*
Instruments and controls	0.10 *(A)(2)*	x 1.5 (CEM, feedback)	---	$19,300	
Taxes	0.03 *(A)*		---	$3,900	
Freight	0.08 *(A)*		---	$10,300	
Total purchased equipment cost :			1.0 *(A)*	$162,300	*(B)*
Direct Installation Cost:					
Foundations and supports	0.06 *(B)*	(venturi scrubber, incinerator)	0.06 *(B)*	$9,700	
Erection and handling	0.40 *(B)*	(absorber)	0.40 *(B)*	$64,900	
Electrical	0.04 *(B)*	(incinerator, adsorber)	---	$6,500	
Piping	0.03 *(B)*	(adsorber, incinerator)	0.03 *(B)*	$4,900	
Insulation	0.01 *(B)*	(absorber/adsorber)	---	$1,600	
Painting	0.01 *(B)*	(absorber/adsorber)	---	$1,600	
Total direct installation costs:			0.49 *(B)*	$89,200	
Total direct costs:			1.49 *(B)*	$251,500	
Indirect Costs: From Exxon Paper =	**$280,000**	**x (package boiler flue gas flowrate - 35900 scfm) / (boiler flue gas flow rate based on paper - 47100 scfm)^0.6 x C.E. Heat Exhangers & Tanks Eq. Factor (Oct. '90 - 371.5 / Dec. '86 - 312.5) =**		**$282,800**	
Indirect Costs:					
Engineering and supervision	0.10 *(B)*	(all except ESP)		-----	
Exxon engineering			**Exxon**	-----	
Construction and field expenses	0.10 *(B)*	(absorber, venturi scrubber)	**Estimate**	$282,800	
Construction fee	0.10 *(B)*			-----	
Startup	0.01 *(B)*	(absorber, venturi scrubber)		$1,600	
Performance test	0.01 *(B)*			$1,600	
Contingencies	0.03 *(B)*	x 5 (efficiency guarantee)		$24,300	
Total indirect costs:				$310,300	
Safety design features (for handling anhydrous ammonia)(3)	$300,000	x (85.4 tons/year of NOx / 455.2 tons/year of NOx)^0.6 =		$114,900	
Total installed capital costs :				$676,700	
Exxon Licensing Fee:	($20,000	+ ($400 /MMBtu (HHV)/hr x 195 MMBtu/hr x 1 unit))/ 1 unit =		$98,000	

(1) Control device costs calculated by the following relationship: 1.49(B) = 1.49(1.00(A)) = 191900
solving for A : 191900 /(1.49 x 1.00) = 128800

(2) Factors in this column are from U.S. EPA OAQPS Control Cost Manual, EPA 450/3-90-006A, January 1990 based on the factors for the control devices indicated.

Table 5-4
Annualized Costs for Exxon Thermal DeNOx For the Champion Package Boiler

Cost item	Computation method	Cost, dollars
<u>Direct operating costs</u>		
Operating Labor		
Operator	$12.96 /hr x 3 hrs/shift x 3 shifts/day x 365 days/yr	42,574
Supervision	15% of operator labor cost	6,386
Operating materials	As required, (0.0% of total installed capital costs)	0
Maintenance (general)		
Labor	$14.26 /hr x 1 hrs/shift x 3 shifts/day x 365 days/yr	15,615
Materials	100% of maintenance labor	15,615
Replacement parts		
Materials	As required, (2.5% of total installed capital costs)	16,918
Labor	100% of maintenance labor	16,918
Materials(boiler/econ.refurb.)	NA	0
Labor(boiler/econ.refurb.)	NA	0
Utilities		
Electricity	$0.059 /kWh x 64,495 kWh/yr	3,805
Fuel oil	$1.050 /gal x 0 gal/yr	0
Gas	$3.300 /M ft^3 x 0 M ft^3/yr	0
Water	$0.100 /M gal x 0 M gal/yr	0
Compressed Air	$0.160 /1000 scfm x 60,970 1000 scfm/yr	9,755
Steam	$7.120 /M lb x 0 M lb/yr	0
Ammonia	$350.000 /ton x 63.2 ton/yr	22,129
Waste disposal	$175.000 /ton x 0 ton/yr	0
Wastewater treatment	$1.725 /M gal x 0 M gal/yr	0
Total Direct Operating Costs (A)	**Subtotal of above**	**149,714** *(A)*
<u>Indirect operating (fixed) costs</u>		
Overhead	60% of operating and maintenance labor and materials, $80,189	48,113
Property Tax	1% of total installed capital costs, $676,700	6,767
Insurance	1% of total installed capital costs, $676,700	6,767
Administration	2% of total installed capital costs, $676,700	13,534
Capital Recovery	CRF, 0.1627 x (total installed capital costs + licensing fee) (at 10% interest and 10 years)	126,079
Total Fixed Costs (B)	**Subtotal of above**	**201,260** *(B)*
Credits		
Product recovery	$0 /ton x 0 ton/yr	0
Heat recovery	$0 /MM Btu x 0 MM Btu/yr	0
Total Credits (C)	**Subtotal of above**	**0** *(C)*
Total Annualized Costs (D)	**(A+B) minus (C)**	**350,974** *(D)*

Tons Of Nox Emitted Per Train: *85.4*

Cost Effectiveness At Emission Reduction, $/Ton Of Nox Reduced

35% = 11,740
40% = 10,270
45% = 9,130
50% = 8,220
55% = 7,470

auxiliary compressed air or steam, similarly to the Exxon Thermal $DeNO_x$ process. The NO_xOUT process is based on the following chemical reaction:

$$CO(NH_2)_2 + 2\ NO + \frac{1}{2} O_2 \text{ ---> } 2N_2 + CO_2 + 2H_2O$$

In the above reaction, one mole of urea is required to react with two moles of NO (i.e., a stoichiometric ratio of 0.5:1). In order to achieve a desired level of removal, greater than stoichiometric quantities of urea must be injected. Manufacturer guidance indicates that a molar ratio of 0.75 - 1 :1 (urea to NO_x) is normally required.

The reaction is temperature dependent. Urea injected alone has a high NO_x reduction activity between 1700 and 1900°F. With process enhancers and adjusted concentrations, the NO_xOUT process is effective from 1500° to 2100°F. Enhancers alone are used between 1000 and 1500°F. A 50% urea solution is typical but solutions as low as 10% may be used. In order to optimize NO_x reduction, different urea and chemical enhancer solutions may be injected at different temperature levels.

The urea (in storage and process piping) must be kept above 70°F to avoid crystallization. Recirculation pumps are also used to prevent crystallization.

NO_xOUT technology is applicable to most stationary combustion equipment. As with Thermal $DeNO_x$, NO_x removal efficiencies will vary depending on the combustion equipment and system configuration. Performance is based on placement of injectors and sufficient mixing of flue gases within the specified temperature range. The NO_xOUT process is generally deemed impractical for application to NO_x sources with large load variations and also to gas turbines.

The capital equipment required for the NO_xOUT process is similar to that required for Exxon Thermal $DeNO_x$ and includes the following:

- Liquid urea storage tank.
- Feed system (pumps, controllers).
- Process monitoring equipment.
- Atomization assist system (steam or air).
- Process piping (pipes, nozzles, mixer).

Licensing fees are associated with this process. The fee is a function of a size of the source and generally is a one time payment of about $500.00 per MM BTU/hr input.

Cost analyses conducted on the NO_xOUT process have yielded results generally comparable to those for the Thermal $DeNO_x$ process. In addition, NH_3 slip also occurs due to decomposition of the urea. Hence, NO_xOUT is ruled out as BACT for the Champion package boiler.

5.2.3.3 Noell Two-Stage DeNO$_x$

Noell has developed and patented the Two-Stage DeNO$_x$ process, which utilizes both urea and methanol injection. Noell's initial pilot studies on a 1 MW crude oil boiler used methanol alone to remove NO$_x$. The final patent involves injection of both urea and methanol through proprietary nozzle designs. In this design the primary function of the methanol is to reduce ammonia slip and air preheater deposits. Emcotek is currently marketing this technology.

The Two-Stage DeNO$_x$ system utilizes two zones of chemical injection. Bulk granular urea is mixed with water prior to injection in the first zone. Liquid methanol is injected in the second zone. The flowrates of the chemicals to the various injection zones are controlled by a sensor for flue gas temperature (or other surrogate measure determined during pilot/start-up testing).

At the present stage of development, the Noell Two-stage DeNO$_x$ system is not considered to be available control technology or technology transfer that could be installed on the package boiler. Furthermore, if it were available and technically feasible at this juncture, it would likely be even less cost effective than Thermal DeNO$_x$ or NO$_x$OUT. Hence, Noell Two-Stage DeNO$_x$ is not BACT.

5.3 Selected NO$_x$ BACT - Combustion Technology

As previously discussed, thermal NO$_x$ formation is related to combustion conditions such as excess air, operating temperature, and residence time. The previously discussed NO$_x$ add-on control technologies remove NO$_x$ after it has been formed. Combustion technology is a method of minimizing NO$_x$ from forming during the combustion process. Combustion design strategies that limit NO$_x$ emissions include reducing the available oxygen at critical stages in the combustion zone, lowering the peak flame temperature, and reducing the residence time during which nitrogen is oxidized. In addition, combustion parameters can be controlled by automatic systems to maintain combustion within the operating range that will minimize NO$_x$ production.

The Champion package boiler incorporates combustion design and control to minimize NO$_x$ emissions. The Coen burners together with the integral flue gas recirculation to the combustion zone results in efficient combustion at excess air levels equivalent to 2.5 - 3.0 percent oxygen levels in the flue gas. The combined design and control of the combustion system results in a NO$_x$ emission rate that does not exceed 0.1 lb/MM Btu based upon recent stack tests.

Therefore, boiler design and combustion control represent BACT for NO$_x$ control for the following reasons:

- Low NO_x emissions can be achieved without creating additional adverse impacts such as emissions of ammonia which occur with the previously discussed add-on controls such as SCR and SNCR.

- The projected NO_x emissions represent the low range of recently permitted levels for many other combustion sources. In fact, the proposed NO_x emission rate of 0.1 lb/MM Btu is half the NSPS Subpart Db limit of 0.2 lb/MM Btu for high heat release boilers such as the Champion package boiler (40 CFR 60.44b).

- There are no available add-on controls which are cost effective.

5.4 BACT for Air Toxic Contaminants

The No. 5 Package Boiler is a low-pressure steam generating unit equipped to be fired solely on natural gas. The boiler is fitted with efficient Coen burners and a system for recirculating 5% of the flue gas to the combustion zone. Although natural gas is considered to be an inherently clean fuel, consideration has been made for air toxic contaminants which could potentially be emitted from the unit. Based upon the EPA document entitled "Toxic Air Pollutant Emission Factors - A Compilation for Selected Air Toxic Compounds and Sources", (EPA-450/2-88-006a, October 1988), trace amounts of formaldehyde and polycyclic organic matter (POM) could be generated as a result of natural gas combustion.

The factors identified in the referenced document are based on a very limited data base and may be over-predictive of the potential emissions from Champion's No. 5 Package Boiler. However, applying the factors to the boiler result in predicted emission rates much less than 0.1 pound per hour for each contaminant. Currently, no emission control technology is being applied to control formaldehyde or POM emissions resulting from natural gas combustion in an industrial boiler. An alternative technology which could be considered would be a switch to a fuel other than natural gas. Based upon the referenced EPA document, similar emission rates would be predicted for both formaldehyde and POM burning either fuel oil or coal in place of natural gas. However, utilization of these fuels would result in substantially higher emission rates for criteria pollutants and therefore cannot be accepted as an alternative control technology.

Therefore, the utilization of natural gas in conjunction with the good combustion design inherent in the Coen burners and flue gas recirculation are representative of BACT for both formaldehyde and POM.

REFERENCES

1. Draft "Top-Down" Best Available Control Technology: A Summary, EPA, Office of Air Quality Planning and Standards, Air Management Division, Noncriteria Pollutants Program Branch, New Source Review Section, May 25, 1989.

2. Draft "Top-Down" Best Available Control Technology Guidance Document, EPA, Office of Air Quality Planning and Standards, Air Quality Management Division, Noncriteria Pollutants Program Branch, New Source Review Section, March 15, 1990.

3. OAQPS Control Cost Manual, Fourth Edition, EPA 450/3-90-006, January 1990, U.S. EPA Office of Air Quality Planning and Standards.

4. In the matter of: Columbia Gulf Transmission Company, PSD Appeal No. 88-11, Order Granting Review by the Administrator, U.S. EPA June 21, 1989.

5. Exxon Research and Engineering Company, "Improved ER&E Thermal DeNO$_x$ Process", October 1987.

APPENDIX A

State of Florida

Department of Environmental Regulation

Permit Application Form

ch12591.jb

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

BOB MARTINEZ
GOVERNOR

DALE TWACHTMANN
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Stationary, industrial [ ] New[1] [X] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: Champion International Corporation COUNTY: Escambia

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) No. 5 Package Boiler

SOURCE LOCATION: Street 375 Muscogee Road City Cantonment

UTM: East 469 North 3386

Latitude 30 ° 36 ' 19 "N Longitude 87 ° 19 ' 13 "W

APPLICANT NAME AND TITLE:

APPLICANT ADDRESS: P.O. Box 87, Cantonment, Florida 32533

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Champion International

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further I agree to maintain and operate the pollution control source and pollution contro facilities in such a manner as to comply with the provision of Chapter 403, Florid Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transferabl and I will promptly notify the department upon sale or legal transfer of the permitte establishment.

*Attach letter of authorization

Signed: F. D. Owenby

F. Doug Owenby, Vice President/Operations Manager
Name and Title (Please Type)

Date: 2/20/91 Telephone No. 904/968-2121

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project hav been designed/examined by me and found to be in conformity with modern engineerin principles applicable to the treatment and disposal of pollutants characterized in th permit application. There is reasonable assurance, in my professional judgment, tha

---

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department.

Signed Randal M. Reynolds

Randal M. Reynolds, P.E.
Name (Please Type)

Roy F. Weston, Inc.
Company Name (Please Type)

1635 Pumphrey Avenue, Auburn, Alabama 36830
Mailing Address (Please Type)

Florida Registration No. 38884 Date: Feb. 18, 1991 Telephone No. 205/826-6100

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.

This application covers existing No. 5 Package Boiler currently operating under the conditions of a temporary permit issued by the DER. See Sections 1.3 and 2.3

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

Start of Construction (NA) See Section 2.3 Completion of Construction (NA) See Section 2.3

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.)

(NA)

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

AO17-161144; issued 3/30/89; expires 4/1/91

AC17-140962/PSD-F1-126; issued 12/17/87, expires 6/1/88

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr (NA) ; if seasonal, describe: (NA)

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No

   a. If yes, has "offset" been applied? (NA)

   b. If yes, has "Lowest Achievable Emission Rate" been applied? (NA)

   c. If yes, list non-attainment pollutants. (NA)

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? No

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? (NA)

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

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

See attached application Section 5.0 for F-2 and Section 3.0 for F-3 and Section 3.0 for F-4.

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		
(N	OT APPL	ICABLE)		

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

1. Total Process Input Rate (lbs/hr): (NA)

2. Product Weight (lbs/hr): (NA)

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
NO_x	19.5	85.4	0.2[a]	NA	19.5	85.4	Stack
CO	19.5	85.4	0.24[b]	NA	19.5	85.4	Stack
SO_2	0.12	0.53	BACT[c] (17-2.600(b)(c))	NA	0.12	0.53	Stack
Particulate Matter	0.98	4.3	BACT[d] (17-2.600(b)(b))	NA	0.98	4.3	Stack
Hydrocarbons	1.8	7.9	0.02[e]	NA	1.80	7.9	Stack

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

[a] Based on permit limit in temporary permit.

[b] Based on permit limit in temporary permit.

[c] Based on AP-42 value of 0.006 pounds/MMBtu.

[d] Based on AP-42 value of 0.05 pounds/MMBtu.

[e] Based on permit limit in temporary perm

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
(NOT APPLICABLE)				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Natural Gas	0.16	0.195	195

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: Trace

Percent Ash: negligible

Density: (NA) lbs/gal

Typical Percent Nitrogen: 1.1 to 3.2 (vol)

Heat Capacity: 1,000 ± Btu/CF

(NA) BTU/gal

Other Fuel Contaminants (which may cause air pollution): (NA)

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average (NA)

Maximum (NA)

G. Indicate liquid or solid wastes generated and method of disposal.

(NA)

N. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 46.9 ft. Stack Diameter: 4 ft.

Gas Flow Rate: 65,000 ACFM 35,880 DSCFM Gas Exit Temperature: 500 °F.

Water Vapor Content: 18 % Velocity: 86.2 FPS

SECTION IV: INCINERATOR INFORMATION

(NOT APPLICABLE)

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste ____________________

Total Weight Incinerated (lbs/hr) __________ Design Capacity (lbs/hr) __________

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ____________________

Date Constructed __________ Model No. __________

	Volume (ft)^3	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ____________________

Brief description of operating characteristics of control devices: NA

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NA

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Refer to indicated sections and pages in the attached application document.

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

   Not Applicable

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made. See Section 2.3-2.5 pp 2-1 to 2.7. Methods 1, 2, 3, 4, and 7 FR Part 60 will be used to demonstrate compliance.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

   See Section 2.3 - 2.5 pp 2-1 to 2-7 and Table 2-1 pp 2-5, Table 2-2 pp 2-7.

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

   NA

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

   NA

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

   See Attachment A-1

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

   See Figure 1-1 p 1-2, Figure 2-1 p 2-2 and Figure 2-2 p 2-3.

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

   See Figure 2-1 p 2-2 and Figure 2-2 p 2-3.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

Enclosed

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

NA

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

Refer to indicated sections and pages in the attached application document.

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

Section 5.0 pp 5-1 to 5-14

[ ] Yes [X] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [X] No See Section 5.2 pp 5-2 to 5-13

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
Nitrogen Dioxide	0.1 lb/10^6 Btu

D. Describe the existing control and treatment technology (if any).

See Section 5.3 p 5-12

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: 46.9 ft.

b. Diameter: 4 ft.

c. Flow Rate: 65,000 ACFM

d. Temperature: 500 °F.

e. Velocity: 86.2 FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

See Section 5.2 pp 5-2 to 5-12

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

---

[1] Explain method of determining efficiency.

[2] Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device: b. Operating Principles:

c. Efficiency:[1] d. Capital Costs:

e. Useful Life: f. Operating Cost:

g. Energy:[2] h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected: See Section 5.3 p 5-12

1. Control Device: 2. Efficiency:[1]

3. Capital Cost: 4. Useful Life:

5. Operating Cost: 6. Energy:[2]

7. Maintenance Cost: 8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

[1] Explain method of determining efficiency.
[2] Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1] Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data Not Applicable

1. ____________ no. sites ____________ TSP ____________ ( ) SO^2* ____________ Wind spd/dir

Period of Monitoring ____ / ____ / ____ to ____ / ____ / ____
month day year month day year

Other data recorded ______________________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. 5 Year(s) of data from 1 / 01 / 85 to 1 / 01 / 89 (month day year to month day year)

2. Surface data obtained from (location) Pensacola, Florida

3. Upper air (mixing height) data obtained from (location) Apalachacola, Florida

4. Stability wind rose (STAR) data obtained from (location) Pensacola, Florida

C. Computer Models Used

1. Industrial Source Complex Long Term Modified? No If yes, attach description.

2. SCREEN Modified? No If yes, attach description.

3. ______ Modified? If yes, attach description.

4. ______ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables. See Appendix D

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	Not Applicable	grams/sec
SO^2	Not Applicable	grams/sec

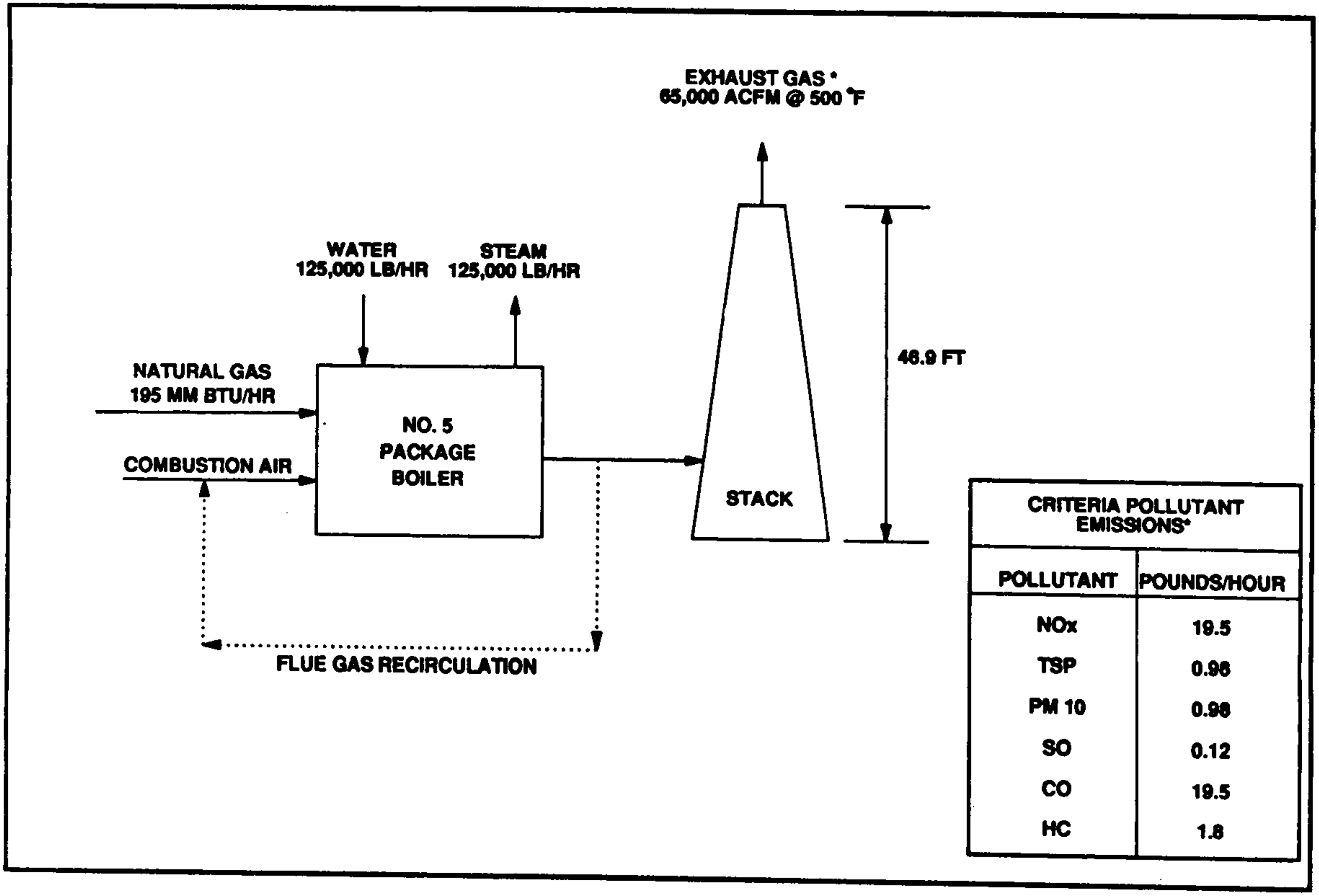
E. Emission Data Used in Modeling
See Section 4.3 Table 4-3 p.4-9, Table 4-5 p 4-12
Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.
See attached application document

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.
See Section 4.6 pp 4-16 to 4-21

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

See attached application document



CRITERIA POLLUTANT EMISSIONS*

POLLUTANT	POUNDS/HOUR
NOx	19.5
TSP	0.98
PM 10	0.98
SO	0.12
CO	19.5
HC	1.8

ATTACHMENT A-1
NO. 5 PACKAGE BOILER
PROCESS FLOW DIAGRAM

CHAMP18-D8

APPENDIX B

Air Quality Modeling

Building Wake Effects Analysis

ch12591.jb

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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

Y-SCREEN BLDG

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :  202.00 feet  [  61.57 meters]
 Northing       :  178.00 feet  [  54.25 meters]
 Rotation Angle :   -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :        4
 Height (HB) :    60.00 feet  [  18.29 meters]


 Maximum projected width (MPW)  :   185.01 feet  [  56.39 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   300.00 feet  [  91.44 meters]
 Huber-Snyder critical height^  :   150.00 feet  [  45.72 meters]
 Schulman-Scire critical height :    90.00 feet  [  27.43 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  49.96 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

           Wind      Proj.           Widths        Min(HB,PW)*
Attack  Direction   Width  Critical  for ISC      0.5    2.0     5
Angle    Sectors     PW^   Height^^  (PW)        XWND   UPWND   DNWND
(deg)     (deg)      (m)    (m)      (m)         (m)    (m)     (m)

  0      180 360    56.3    27.4    56.3         9.1    36.6    91.4
 23       23 202    51.0    27.4    51.0         9.1    36.6    91.4
 45       45 225    37.9    27.4    37.9         9.1    36.6    91.4
 67       67 247    42.4    27.4    42.4         9.1    36.6    91.4
 90       90 270    53.4    27.4    53.4         9.1    36.6    91.4
 113     113 292    56.4    27.4    56.4         9.1    36.6    91.4
 135     135 315    56.2    27.4    56.2         9.1    36.6    91.4
 157     157 338    56.4    27.4    56.4         9.1    36.6    91.4

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
```

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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

            V-CHIP SILOS

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :  -140.00 feet  [ -42.67 meters]
 Northing       :   -74.00 feet  [ -22.56 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners      :        4
 Height (HB) :     90.00 feet  [  27.43 meters]


 Maximum projected width (MPW)  :    183.97 feet  [  56.07 meters]
 Building correction angle      :       0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :    450.00 feet  [ 137.16 meters]
 Huber-Snyder critical height^  :    225.00 feet  [  68.58 meters]
 Schulman-Scire critical height :    135.00 feet  [  41.15 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  49.68 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

           Wind      Proj.            Widths          Min(HB,PW)*
Attack   Direction   Width  Critical  for ISC     0.5     2.0     5
Angle     Sectors    PW^    Height^^  (PW)       XWND    UPWND   DNWND
(deg)      (deg)     (m)     (m)      (m)        (m)     (m)     (m)

  0       180 360    48.5    41.1     48.5       13.7    54.9   137.2
 23        23 202    55.6    41.1     55.6       13.7    54.9   137.2
 45        45 225    56.1    41.1     56.1       13.7    54.9   137.2
 67        67 247    56.1    41.1     56.1       13.7    54.9   137.2
 90        90 270    54.4    41.1     54.4       13.7    54.9   137.2
113       113 292    45.0    41.1     45.0       13.7    54.9   137.2
135       135 315    28.8    41.1     28.8       13.7    54.9   137.2
157       157 338    34.1    41.1     34.1       13.7    54.9   137.2

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
```

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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.           WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

          U-BLEACH PLANT

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :  -185.00 feet  [ -56.39 meters]
 Northing       :   310.00 feet  [  94.49 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :       14
 Height (HB) :    60.00 feet  [  18.29 meters]


 Maximum projected width (MPW)  :   271.53 feet  [  82.76 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   300.00 feet  [  91.44 meters]
 Huber-Snyder critical height^  :   150.00 feet  [  45.72 meters]
 Schulman-Scire critical height :    90.00 feet  [  27.43 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  73.33 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

           Wind       Proj.           Widths        Min(HB,PW)*
Attack   Direction    Width  Critical  for ISC     0.5    2.0     5
Angle     Sectors     PW^    Height^^  (PW)       XWND   UPWND   DWWND
(deg)      (deg)      (m)     (m)      (m)        (m)    (m)     (m)

   0      180 360     78.2    27.4     78.2        9.1    36.6    91.4
  23       23 202     81.4    27.4     81.4        9.1    36.6    91.4
  45       45 225     80.8    27.4     80.8        9.1    36.6    91.4
  67       67 247     82.7    27.4     82.7        9.1    36.6    91.4
  90       90 270     82.8    27.4     82.8        9.1    36.6    91.4
 113      113 292     77.7    27.4     77.7        9.1    36.6    91.4
 135      135 315     62.3    27.4     62.3        9.1    36.6    91.4
 157      157 338     64.3    27.4     64.3        9.1    36.6    91.4

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.           WORK ORDER NO.   22464301
RUN TITLE:               CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

T-NO.9 H.D. STORAGE CHEST

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :    52.00 feet  [  15.85 meters]
 Northing       :   290.00 feet  [  88.39 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners       :        4
 Height (HB) :    75.00 feet  [  22.86 meters]


 Maximum projected width (MPW)  :    91.92 feet  [  28.02 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   375.00 feet  [ 114.30 meters]
 Huber-Snyder critical height^  :   187.50 feet  [  57.15 meters]
 Schulman-Scire critical height :   112.50 feet  [  34.29 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  24.82 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

           Wind      Proj.            Widths          Min(HB,PW)*
Attack   Direction   Width  Critical  for ISC      0.5     2.0      5
Angle     Sectors     PW^   Height^^   (PW)       XWND    UPWND   DNWND
(deg)      (deg)      (m)     (m)      (m)        (m)     (m)     (m)

   0      180 360    28.0    34.3     28.0       11.4    45.7   114.3
  23       23 202    28.0    34.3     28.0       11.4    45.7   114.3
  45       45 225    25.2    34.3     25.2       11.4    45.7   114.3
  67       67 247    26.4    34.3     26.4       11.4    45.7   114.3
  90       90 270    28.0    34.3     28.0       11.4    45.7   114.3
 113      113 292    28.0    34.3     28.0       11.4    45.7   114.3
 135      135 315    25.2    34.3     25.2       11.4    45.7   114.3
 157      157 338    26.4    34.3     26.4       11.4    45.7   114.3

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.           WORK ORDER NO.   22464301
RUN TITLE:               CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

                S-WASHER

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   210.00 feet  [  64.01 meters]
 Northing       :  -124.00 feet  [ -37.80 meters]
 Rotation Angle :     -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners      :         4
 Height (HB) :   100.00 feet  [  30.48 meters]


 Maximum projected width (MPW)  :     49.50 feet  [  15.09 meters]
 Building correction angle      :       0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   247.49 feet  [  75.43 meters]
 Huber-Snyder critical height^  :   174.25 feet  [  53.11 meters]
 Schulman-Scire critical height :   124.75 feet  [  38.02 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  13.37 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

            Wind      Proj.           Widths         Min(HB,PW)*
Attack   Direction   Width  Critical  for ISC     0.5    2.0     5
Angle     Sectors     PW^   Height^^  (PW)       XWND   UPWND  DNWND
(deg)      (deg)      (m)     (m)     (m)        (m)    (m)    (m)

   0      180 360     15.1    38.0    15.1       7.5    30.2   75.4
  23       23 202     15.1    38.0    15.1       7.5    30.1   75.3
  45       45 225     13.6    37.3    13.6       6.8    27.1   67.8
  67       67 247     14.2    37.6    14.2       7.1    28.4   71.1
  90       90 270     15.1    38.0    15.1       7.5    30.2   75.4
 113      113 292     15.1    38.0    15.1       7.5    30.1   75.3
 135      135 315     13.6    37.3    13.6       6.8    27.1   67.8
 157      157 338     14.2    37.6    14.2       7.1    28.4   71.1

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

        R-CONT. DIGESTER

SITE COORDINATES (NW CORNER OR CENTER):
 Easting         :   220.00 feet  [  67.06 meters]
 Northing        :   -78.00 feet  [ -23.77 meters]
 Rotation Angle :     -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :         4
 Height (HB) :    200.00 feet  [  60.96 meters]


 Maximum projected width (MPW)  :     31.11 feet  [   9.48 meters]
 Building correction angle      :       0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   155.56 feet  [  47.42 meters]
 Huber-Snyder critical height^  :   246.67 feet  [  75.18 meters]
 Schulman-Scire critical height :   215.56 feet  [  65.70 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =   8.40 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

          Wind       Proj.            Widths          Min(HB,PW)*
Attack  Direction   Width  Critical   for ISC     0.5     2.0      5
Angle    Sectors     PW^   Height^^   (PW)       XWND    UPWND   DNWND
(deg)     (deg)      (m)     (m)       (m)        (m)     (m)     (m)

  0      180 360     9.5    65.7       9.5        4.7    19.0    47.4
 23       23 202     9.5    65.7       9.5        4.7    18.9    47.3
 45       45 225     8.5    65.2       8.5        4.3    17.0    42.6
 67       67 247     8.9    65.4       8.9        4.5    17.9    44.7
 90       90 270     9.5    65.7       9.5        4.7    19.0    47.4
113      113 292     9.5    65.7       9.5        4.7    18.9    47.3
135      135 315     8.5    65.2       8.5        4.3    17.0    42.6
157      157 338     8.9    65.4       8.9        4.5    17.9    44.7

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.           WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

  Q-HIGH BAY STORAGE BLDG

SITE COORDINATES (NW CORNER OR CENTER):
 Easting         :   400.00 feet  [ 121.92 meters]
 Northing        :  1300.00 feet  [ 396.24 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :        4
 Height (HB) :    75.00 feet  [   22.86 meters]


 Maximum projected width (MPW)  :   309.53 feet  [  94.35 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   375.00 feet  [ 114.30 meters]
 Huber-Snyder critical height^  :   187.50 feet  [  57.15 meters]
 Schulman-Scire critical height :   112.50 feet  [  34.29 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  83.59 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

           Wind      Proj.           Widths         Min(HB,PW)*
Attack   Direction   Width  Critical  for ISC      0.5    2.0     5
Angle     Sectors    PW^    Height^^  (PW)         XWND   UPWND   DNWND
(deg)      (deg)     (m)     (m)      (m)          (m)    (m)     (m)

  0      180 360     91.4    34.3     91.4         11.4   45.7   114.3
 23       23 202     94.3    34.3     94.3         11.4   45.7   114.3
 45       45 225     93.3    34.3     93.3         11.4   45.7   114.3
 67       67 247     94.3    34.3     94.3         11.4   45.7   114.3
 90       90 270     94.3    34.3     94.3         11.4   45.7   114.3
113      113 292     88.2    34.3     88.2         11.4   45.7   114.3
135      135 315     68.7    34.3     68.7         11.4   45.7   114.3
157      157 338     75.6    34.3     75.6         11.4   45.7   114.3

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

     P-NO.3 PAPER MACHINE

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   275.00 feet  [  83.82 meters]
 Northing       :   745.00 feet  [ 227.08 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :         8
 Height (HB) :    60.00 feet  [  18.29 meters]


 Maximum projected width (MPW)  :   522.15 feet  [ 159.15 meters]
 Building correction angle      :       0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   300.00 feet  [  91.44 meters]
 Huber-Snyder critical height^  :   150.00 feet  [  45.72 meters]
 Schulman-Scire critical height :    90.00 feet  [  27.43 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 = 141.01 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

           Wind      Proj.             Widths          Min(HB,PW)*
Attack   Direction   Width  Critical  for ISC      0.5     2.0      5
Angle     Sectors     PW^   Height^^   (PW)       XWND    UPWND   DNWND
(deg)      (deg)      (m)     (m)      (m)         (m)     (m)     (m)

   0      180 360    136.3    27.4    136.3        9.1    36.6    91.4
  23       23 202    156.9    27.4    156.9        9.1    36.6    91.4
  45       45 225    158.5    27.4    158.5        9.1    36.6    91.4
  67       67 247    159.2    27.4    159.2        9.1    36.6    91.4
  90       90 270    154.7    27.4    154.7        9.1    36.6    91.4
 113      113 292    128.6    27.4    128.6        9.1    36.6    91.4
 135      135 315     82.9    27.4     82.9        9.1    36.6    91.4
 157      157 338     95.0    27.4     95.0        9.1    36.6    91.4

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

  D-NO. 5 PAPER MACHINE

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   424.00 feet  [ 129.24 meters]
 Northing       :   782.00 feet  [ 238.35 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :         6
 Height (HB) :    60.00 feet  [  18.29 meters]


 Maximum projected width (MPW)  :   588.40 feet  [ 179.34 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   300.00 feet  [  91.44 meters]
 Huber-Snyder critical height^  :   150.00 feet  [  45.72 meters]
 Schulman-Scire critical height :    90.00 feet  [  27.43 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 = 158.90 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

            Wind      Proj.           Widths        Min(HB,PW)*
Attack   Direction   Width  Critical  for ISC     0.5    2.0     5
Angle     Sectors     PW^   Height^^  (PW)        XWND   UPWND  DNWND
(deg)      (deg)      (m)    (m)      (m)         (m)    (m)    (m)

   0      180 360    162.4   27.4    162.4        9.1   36.6   91.4
  23       23 202    179.2   27.4    179.2        9.1   36.6   91.4
  45       45 225    179.3   27.4    179.3        9.1   36.6   91.4
  67       67 247    175.6   27.4    175.6        9.1   36.6   91.4
  90       90 270    170.5   27.4    170.5        9.1   36.6   91.4
 113      113 292    141.6   27.4    141.6        9.1   36.6   91.4
 135      135 315     91.0   27.4     91.0        9.1   36.6   91.4
 157      157 338    120.9   27.4    120.9        9.1   36.6   91.4

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

      N-RECOVERY BOILERS

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   690.00 feet  [ 210.31 meters]
 Northing       :   -24.00 feet  [  -7.32 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners      :       10
 Height (HB) :   160.00 feet  [  48.77 meters]


 Maximum projected width (MPW)  :   174.93 feet  [  53.32 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   800.00 feet  [ 243.84 meters]
 Huber-Snyder critical height^  :   400.00 feet  [ 121.92 meters]
 Schulman-Scire critical height :   240.00 feet  [  73.15 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  47.24 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

          Wind      Proj.             Widths          Min(HB,PW)*
Attack  Direction   Width  Critical  for ISC     0.5    2.0      5
Angle    Sectors    PW^    Height^^  (PW)       XWND   UPWND   DNWND
(deg)     (deg)     (m)     (m)      (m)        (m)    (m)     (m)


   0      180 360   53.3    73.2     53.3       24.4   97.5   243.8
  23       23 202   51.1    73.2     51.1       24.4   97.5   243.8
  45       45 225   46.6    72.1     46.6       23.3   93.1   232.9
  67       67 247   43.5    70.5     43.5       21.8   87.1   217.7
  90       90 270   50.1    73.2     50.1       24.4   97.5   243.8
 113      113 292   51.7    73.2     51.7       24.4   97.5   243.8
 135      135 315   51.1    73.2     51.1       24.4   97.5   243.8
 157      157 338   53.1    73.2     53.1       24.4   97.5   243.8

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

  M-PRECIPITATORS 2

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   776.00 feet  [ 236.52 meters]
 Northing       :  -145.00 feet  [ -44.20 meters]
 Rotation Angle :     -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners      :          4
 Height (HD) :   100.00 feet  [  30.48 meters]


 Maximum projected width (MPW)  :     84.15 feet  [  25.65 meters]
 Building correction angle      :       0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   420.73 feet  [ 128.24 meters]
 Huber-Snyder critical height^  :   226.22 feet  [  68.95 meters]
 Schulman-Scire critical height :   142.07 feet  [  43.30 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  22.72 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

           Wind      Proj.             Widths          Min(HD,PW)*
Attack   Direction   Width  Critical  For ISC      0.5     2.0      5
Angle     Sectors     PW^   Height^^   (PW)        XWND    UPWND   DNWND
(deg)      (deg)      (m)     (m)      (m)         (m)     (m)     (m)

   0      180 360     25.6    43.3     25.6        12.8    51.3   128.2
  23       23 202     25.6    43.3     25.6        12.8    51.2   128.1
  45       45 225     23.1    42.1     23.1        11.6    46.3   115.7
  67       67 247     24.2    42.6     24.2        12.1    48.5   121.2
  90       90 270     25.6    43.3     25.6        12.8    51.3   128.2
 113      113 292     25.6    43.3     25.6        12.8    51.2   127.9
 135      135 315     23.0    42.0     23.0        11.5    45.9   114.8
 157      157 338     24.1    42.5     24.1        12.1    48.2   120.5

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.            WORK ORDER NO.   22464301
RUN TITLE:               CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

  L-PRECIPITATORS 1

SITE COORDINATES (NW CORNER OR CENTER):
 Easting         :   700.00 feet  [ 213.36 meters]
 Northing        :  -145.00 feet  [ -44.20 meters]
 Rotation Angle :     -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners      :         4
 Height (HB) :   100.00 feet  [  30.48 meters]


 Maximum projected width (MPW)  :     83.45 feet  [  25.44 meters]
 Building correction angle      :       0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   417.25 feet  [ 127.18 meters]
 Huber-Snyder critical height^  :   225.18 feet  [  68.63 meters]
 Schulman-Scire critical height :   141.73 feet  [  43.20 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  22.54 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

           Wind      Proj.             Widths          Min(HB,PW)*
Attack  Direction   Width  Critical   For ISC      0.5     2.0     5
Angle    Sectors     PW^    Height^^   (PW)        XWND    UPWND   DNWND
(deg)     (deg)      (m)     (m)       (m)         (m)     (m)     (m)

  0      180 360     25.4    43.2      25.4        12.7    50.9   127.2
 23       23 202     25.4    43.2      25.4        12.7    50.8   127.1
 45       45 225     23.0    42.0      23.0        11.5    46.1   115.2
 67       67 247     24.1    42.5      24.1        12.1    48.2   120.6
 90       90 270     25.4    43.2      25.4        12.7    50.9   127.2
113      113 292     25.4    43.2      25.4        12.7    50.7   126.8
135      135 315     22.7    41.8      22.7        11.3    45.3   113.3
157      157 338     23.8    42.4      23.8        11.9    47.7   119.1

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:             CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

I+J+K-NO.1+2 BOILER/TURB

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   424.00 feet  [ 129.24 meters]
 Northing       :   148.00 feet  [  45.11 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :        14
 Height (HB) :    55.00 feet  [  16.76 meters]


 Maximum projected width (MPW)  :   282.40 feet  [  86.07 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   275.00 feet  [  83.82 meters]
 Huber-Snyder critical height^  :   137.50 feet  [  41.91 meters]
 Schulman-Scire critical height :    82.50 feet  [  25.15 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  76.26 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

          Wind      Proj.            Widths          Min(HB,PW)*
Attack  Direction   Width  Critical  for ISC      0.5    2.0     5
Angle    Sectors    PW^    Height^^  (PW)         XWND   UPWND   DNWND
(deg)     (deg)     (m)     (m)      (m)          (m)    (m)     (m)

  0      180 360    65.2    25.1     65.2         8.4    33.5    83.8
 23       23 202    50.3    25.1     50.3         8.4    33.5    83.8
 45       45 225    50.1    25.1     50.1         8.4    33.5    83.8
 67       67 247    73.0    25.1     73.0         8.4    33.5    83.8
 90       90 270    84.9    25.1     84.9         8.4    33.5    83.8
113      113 292    86.1    25.1     86.1         8.4    33.5    83.8
135      135 315    83.7    25.1     83.7         8.4    33.5    83.8
157      157 338    72.4    25.1     72.4         8.4    33.5    83.8

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

      I-NO.3 POWER BOILER

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   424.00 feet  [ 129.24 meters]
 Northing       :   148.00 feet  [  45.11 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners    :         4
 Height (HB) :    75.00 feet  [  22.86 meters]


 Maximum projected width (MPW)  :   131.73 feet  [  40.15 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   375.00 feet  [ 114.30 meters]
 Huber-Snyder critical height^  :   187.50 feet  [  57.15 meters]
 Schulman-Scire critical height :   112.50 feet  [  34.29 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  35.57 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

           Wind      Proj.            Widths          Min(HB,PW)*
Attack   Direction   Width  Critical  for ISC      0.5     2.0     5
Angle     Sectors    PW^    Height^^  (PW)        XWND   UPWND   DNWND
(deg)      (deg)     (m)     (m)      (m)          (m)    (m)     (m)

  0       180 360    39.3    34.3     39.3        11.4   45.7   114.3
 23        23 202    40.1    34.3     40.1        11.4   45.7   114.3
 45        45 225    39.4    34.3     39.4        11.4   45.7   114.3
 67        67 247    40.0    34.3     40.0        11.4   45.7   114.3
 90        90 270    40.2    34.3     40.2        11.4   45.7   114.3
113       113 292    38.1    34.3     38.1        11.4   45.7   114.3
135       135 315    30.3    34.3     30.3        11.4   45.7   114.3
157       157 338    33.1    34.3     33.1        11.4   45.7   114.3

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

              H-DIGESTER

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   102.00 feet  [  31.09 meters]
 Northing       :    10.00 feet  [   3.05 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :        4
 Height (HB) :   200.00 feet  [  60.96 meters]


 Maximum projected width (MPW)  :    263.29 feet  [  80.25 meters]
 Building correction angle      :        0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :  1000.00 feet  [ 304.80 meters]
 Huber-Snyder critical height^  :   500.00 feet  [ 152.40 meters]
 Schulman-Scire critical height :   300.00 feet  [  91.44 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  71.10 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

          Wind      Proj.             Widths          Min(HB,PW)*
Attack  Direction   Width  Critical   for ISC      0.5     2.0      5
Angle    Sectors    PW^    Height^^   (PW)         XWND    UPWND    DNWND
(deg)     (deg)     (m)     (m)       (m)          (m)     (m)      (m)

  0      180 360    75.2    91.4      75.2         30.5    121.9    304.8
 23       23 202    58.9    90.4      58.9         29.4    117.7    294.3
 45       45 225    33.5    77.7      33.5         16.7     67.0    167.5
 67       67 247    41.5    81.7      41.5         20.8     83.1    207.7
 90       90 270    64.6    91.4      64.6         30.5    121.9    304.8
113      113 292    77.9    91.4      77.9         30.5    121.9    304.8
135      135 315    80.2    91.4      80.2         30.5    121.9    304.8
157      157 338    80.2    91.4      80.2         30.5    121.9    304.8

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

        G-LIME KILN SOUTH

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   265.00 feet  [  80.77 meters]
 Northing       :  -695.00 feet  [-211.84 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners      :          6
 Height (HB) :     50.00 feet  [  15.24 meters]


 Maximum projected width (MPW)  :     88.81 feet  [  27.07 meters]
 Building correction angle      :       0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   250.00 feet  [  76.20 meters]
 Huber-Snyder critical height^  :   125.00 feet  [  38.10 meters]
 Schulman-Scire critical height :    75.00 feet  [  22.86 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  23.98 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

          Wind       Proj.          Widths          Min(HB,PW)*
Attack  Direction    Width  Critical  for ISC     0.5     2.0     5
Angle    Sectors     PW^    Height^^  (PW)       XWND    UPWND   DWWND
(deg)     (deg)      (m)     (m)      (m)        (m)     (m)     (m)

   0     180 360     27.1    22.9     27.1       7.6    30.5    76.2
  23      23 202     26.4    22.9     26.4       7.6    30.5    76.2
  45      45 225     22.1    22.9     22.1       7.6    30.5    76.2
  67      67 247     18.9    22.9     18.9       7.6    30.5    76.2
  90      90 270     19.1    22.9     19.1       7.6    30.5    76.2
 113     113 292     22.0    22.9     22.0       7.6    30.5    76.2
 135     135 315     22.7    22.9     22.7       7.6    30.5    76.2
 157     157 338     26.6    22.9     26.6       7.6    30.5    76.2

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

        F-LIME KILN NORTH

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   288.00 feet  [  87.78 meters]
 Northing       :  -400.00 feet  [-121.92 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners       :       4
 Height (HB) :    50.00 feet  [  15.24 meters]


 Maximum projected width (MPW)  :    59.41 feet  [  18.11 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   250.00 feet  [  76.20 meters]
 Huber-Snyder critical height^  :   125.00 feet  [  38.10 meters]
 Schulman-Scire critical height :    75.00 feet  [  22.86 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  16.04 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

          Wind      Proj.            Widths        Min(HB,PW)*
Attack  Direction   Width  Critical  for ISC     0.5    2.0     5
Angle    Sectors    PW^    Height^^  (PW)        XWND   UPWND   DWWND
(deg)    (deg)      (m)    (m)      (m)         (m)    (m)     (m)

   0     180 360     18.1    22.9     18.1        7.6    30.5    76.2
  23      23 202     18.0    22.9     18.0        7.6    30.5    76.2
  45      45 225     16.1    22.9     16.1        7.6    30.5    76.2
  67      67 247     16.9    22.9     16.9        7.6    30.5    76.2
  90      90 270     18.1    22.9     18.1        7.6    30.5    76.2
 113     113 292     18.1    22.9     18.1        7.6    30.5    76.2
 135     135 315     16.5    22.9     16.5        7.6    30.5    76.2
 157     157 338     17.2    22.9     17.2        7.6    30.5    76.2

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

           E-EVAPORATORS

SITE COORDINATES (NW CORNER OR CENTER):
 Easting          :   544.00 feet  [ 165.81 meters]
 Northing         :  -174.00 feet  [ -53.04 meters]
 Rotation Angle :     -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners      :        8
 Height (HB) :     75.00 feet  [   22.86 meters]


 Maximum projected width (MPW)  :   229.89 feet  [  70.07 meters]
 Building correction angle      :       0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   375.00 feet  [ 114.30 meters]
 Huber-Snyder critical height^  :   187.50 feet  [  57.15 meters]
 Schulman-Scire critical height :   112.50 feet  [  34.29 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  62.08 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

          Wind      Proj.            Widths          Min(HB,PW)*
Attack  Direction   Width  Critical  for ISC      0.5     2.0      5
Angle    Sectors     PW^   Height^^   (PW)        XWND   UPWND   DNWND
(deg)     (deg)      (m)     (m)      (m)         (m)     (m)     (m)

  0      180 360     61.2    34.3     61.2        11.4    45.7   114.3
 23       23 202     63.0    34.3     63.0        11.4    45.7   114.3
 45       45 225     63.8    34.3     63.8        11.4    45.7   114.3
 67       67 247     70.0    34.3     70.0        11.4    45.7   114.3
 90       90 270     70.1    34.3     70.1        11.4    45.7   114.3
113      113 292     65.4    34.3     65.4        11.4    45.7   114.3
135      135 315     50.8    34.3     50.8        11.4    45.7   114.3
157      157 338     50.8    34.3     50.8        11.4    45.7   114.3

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:41

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

 D-TURBINE GENERATOR BLDG

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   498.00 feet  [ 151.79 meters]
 Northing       :    44.00 feet  [  13.41 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :         6
 Height (HB) :     70.00 feet  [  21.34 meters]


 Maximum projected width (MPW)  :   203.84 feet  [  62.13 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   350.00 feet  [ 106.68 meters]
 Huber-Snyder critical height^  :   175.00 feet  [  53.34 meters]
 Schulman-Scire critical height :   105.00 feet  [  32.00 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  55.05 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

          Wind      Proj.            Widths         Min(HB,PW)*
Attack  Direction   Width  Critical  for ISC     0.5     2.0      5
Angle    Sectors    PW^    Height^^  (PW)       XWND    UPWND   DNWND
(deg)     (deg)     (m)     (m)      (m)        (m)      (m)     (m)

  0      180 360    52.6    32.0     52.6       10.7    42.7    106.7
 23       23 202    48.1    32.0     48.1       10.7    42.7    106.7
 45       45 225    44.8    32.0     44.8       10.7    42.7    106.7
 67       67 247    56.4    32.0     56.4       10.7    42.7    106.7
 90       90 270    62.1    32.0     62.1       10.7    42.7    106.7
113      113 292    62.1    32.0     62.1       10.7    42.7    106.7
135      135 315    58.1    32.0     58.1       10.7    42.7    106.7
157      157 338    52.6    32.0     52.6       10.7    42.7    106.7

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:41

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

      C-NO.4 POWER BOILER

SITE COORDINATES (NW CORNER OR CENTER):
 Easting         :   498.00 feet  [ 151.79 meters]
 Northing        :    44.00 feet  [  13.41 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :         4
 Height (HB) :   160.00 feet  [  48.77 meters]


 Maximum projected width (MPW)  :   149.59 feet  [  45.59 meters]
 Building correction angle      :       0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   747.93 feet  [ 227.97 meters]
 Huber-Snyder critical height^  :   384.38 feet  [ 117.16 meters]
 Schulman-Scire critical height :   234.79 feet  [  71.56 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  40.40 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

           Wind       Proj.            Widths          Min(HB,PW)*
Attack   Direction   Width  Critical  for ISC      0.5     2.0      5
Angle     Sectors     PW^   Height^^  (PW)        XWND   UPWND   DNWND
(deg)      (deg)      (m)     (m)     (m)          (m)     (m)     (m)

   0      180 360     44.5    71.0    44.5        22.3    89.1   222.7
  23       23 202     45.6    71.6    45.6        22.8    91.2   228.0
  45       45 225     44.8    71.2    44.8        22.4    89.6   224.0
  67       67 247     45.5    71.5    45.5        22.7    90.9   227.4
  90       90 270     45.6    71.6    45.6        22.8    91.2   228.0
 113      113 292     43.1    70.3    43.1        21.6    86.3   215.7
 135      135 315     34.2    65.9    34.2        17.1    68.5   171.1
 157      157 338     37.4    67.5    37.4        18.7    74.8   187.1

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.           WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:41

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

          B-COOLING TOWER

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   565.00 feet  [ 172.21 meters]
 Northing       :  -392.00 feet  [-119.48 meters]
 Rotation Angle :     -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :         4
 Height (HB) :    40.00 feet  [  12.19 meters]


 Maximum projected width (MPW)  :    72.25 feet  [  22.02 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   200.00 feet  [  60.96 meters]
 Huber-Snyder critical height^  :   100.00 feet  [  30.48 meters]
 Schulman-Scire critical height :    60.00 feet  [  18.29 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  19.51 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

           Wind       Proj.             Widths          Min(HB,PW)*
Attack   Direction   Width  Critical  for ISC       0.5    2.0     5
Angle     Sectors     PW^   Height^^  (PW)          XWND   UPWND   DNWND
(deg)      (deg)      (m)     (m)     (m)           (m)    (m)     (m)

   0      180 360    22.0    18.3    22.0          6.1    24.4    61.0
  23       23 202    22.0    18.3    22.0          6.1    24.4    61.0
  45       45 225    20.3    18.3    20.3          6.1    24.4    61.0
  67       67 247    21.2    18.3    21.2          6.1    24.4    61.0
  90       90 270    22.0    18.3    22.0          6.1    24.4    61.0
 113      113 292    21.9    18.3    21.9          6.1    24.4    61.0
 135      135 315    19.2    18.3    19.2          6.1    24.4    61.0
 157      157 338    20.3    18.3    20.3          6.1    24.4    61.0

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.            WORK ORDER NO.   22464301
RUN TITLE:             CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:41

DWA:  DOWNWASH CALCULATIONS FOR AN ISOLATED SIMPLE STRUCTURE

     A-LINE RECOVERY BLDG

SITE COORDINATES (NW CORNER OR CENTER):
 Easting        :   350.00 feet  [ 106.68 meters]
 Northing       :  -258.00 feet  [ -78.64 meters]
 Rotation Angle :    -37.0 degrees

STRUCTURE DIMENSIONS:
 Corners     :        8
 Height (HB) :     70.00 feet  [  21.34 meters]


 Maximum projected width (MPW)  :   132.23 feet  [  40.30 meters]
 Building correction angle      :      0.0 degrees

CRITICAL HEIGHT INFORMATION:
 Radius of effect of structure  :   350.00 feet  [ 106.68 meters]
 Huber-Snyder critical height^  :   175.00 feet  [  53.34 meters]
 Schulman-Scire critical height :   105.00 feet  [  32.00 meters]

 ^ - Maximum GEP stack height for the structure.

HUBER-SNYDER DOWNWASH DIMENSIONS:
 HL = HW = MPW * 0.886 =  35.71 meters

SCHULMAN-SCIRE DOWNWASH CALCULATIONS:

          Wind      Proj.            Widths         Min(HB,PW)*
Attack  Direction   Width  Critical  for ISC      0.5     2.0     5
Angle    Sectors     PW^   Height^^   (PW)       XWND    UPWND   DNWND
(deg)     (deg)      (m)     (m)      (m)        (m)     (m)     (m)

   0     180 360     33.0    32.0     33.0       10.7    42.7   106.7
  23      23 202     36.3    32.0     36.3       10.7    42.7   106.7
  45      45 225     36.3    32.0     36.3       10.7    42.7   106.7
  67      67 247     40.2    32.0     40.2       10.7    42.7   106.7
  90      90 270     40.3    32.0     40.3       10.7    42.7   106.7
 113     113 292     38.3    32.0     38.3       10.7    42.7   106.7
 135     135 315     30.6    32.0     30.6       10.7    42.7   106.7
 157     157 338     27.1    32.0     27.1       10.7    42.7   106.7

^  - Maximum projected width at 1 degree intervals in each sector.
^^ - Schulman-Scire GEP height based on directional PW.
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.           WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:46

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID        :      DISSOLV. TANK STACK B
Source Height    :   100.00 feet  [  30.48 meters]
Source Diameter  :     1.00 feet  [   0.30 meters]

INPUT SITE COORDINATES:
 Easting     :   720.00 feet  [ 219.46 meters]
 Northing    :  -110.00 feet  [ -33.53 meters]

ROTATED SITE COORDINATES:
 Easting     :   641.22 feet  [ 195.44 meters]
 Northing    :   345.46 feet  [ 105.30 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE:
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR    PW    HB        DOMINANT STRUCTURE      ! DIR    PW      HB       DOMINANT STRUCTURE
deg    m     m                                 ! deg    m       m
-----------------------------------------------------------------------------------------------
 23    51.1  48.8         N-RECOVERY BOILERS   !  202   51.1   48.8          N-RECOVERY BOILERS
 45    46.6  48.8         N-RECOVERY BOILERS   !  225   46.6   48.8          N-RECOVERY BOILERS
 67    45.5  48.8       C-NO.4 POWER BOILER    !  247   41.5   61.0                  H-DIGESTER
 90    50.1  48.8         N-RECOVERY BOILERS   !  270   50.1   48.8          N-RECOVERY BOILERS
113    51.7  48.8         N-RECOVERY BOILERS   !  292   51.7   48.8          N-RECOVERY BOILERS
135    51.1  48.8         N-RECOVERY BOILERS   !  315   51.1   48.8          N-RECOVERY BOILERS
157    53.1  48.8         N-RECOVERY BOILERS   !  338   53.1   48.8          N-RECOVERY BOILERS
180    53.3  48.8         N-RECOVERY BOILERS   !  360   53.3   48.8          N-RECOVERY BOILERS
-----------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                 H-DIGESTER
 HL = HW = MPW * 0.086 =  71.10 meters
 HB =  60.96 meters
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:45

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID       :      DISSOLV. TANK STACK A
Source Height   :    100.00 feet  [  30.48 meters]
Source Diameter :      1.00 feet  [   0.30 meters]

INPUT SITE COORDINATES:
 Easting      :   805.00 feet  [ 245.36 meters]
 Northing     :  -110.00 feet  [ -33.53 meters]

ROTATED SITE COORDINATES:
 Easting      :   709.10 feet  [ 216.13 meters]
 Northing     :   396.61 feet  [ 120.89 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR   PW    HB       DOMINANT STRUCTURE     | DIR    PW      HB       DOMINANT STRUCTURE
deg   m     m                               | deg    m       m
-----------------------------------------------------------------------------------------
 23   51.1  48.8       N-RECOVERY BOILERS   |  202    51.1  48.8        N-RECOVERY BOILERS
 45   46.6  48.8       N-RECOVERY BOILERS   |  225    46.6  48.8        N-RECOVERY BOILERS
 67   45.5  48.8     C-NO.4 POWER BOILER    |  247    41.5  61.0                H-DIGESTER
 90   50.1  48.8       N-RECOVERY BOILERS   |  270    50.1  48.8        N-RECOVERY BOILERS
113   51.7  48.8       N-RECOVERY BOILERS   |  292    51.7  48.8        N-RECOVERY BOILERS
135   51.1  48.8       N-RECOVERY BOILERS   |  315    51.1  48.8        N-RECOVERY BOILERS
157   53.1  48.8       N-RECOVERY BOILERS   |  338    53.1  48.8        N-RECOVERY BOILERS
180   53.3  48.8       N-RECOVERY BOILERS   |  360    53.3  48.8        N-RECOVERY BOILERS
-----------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                H-DIGESTER
 HL = HW = MPW * 0.886 =  71.10 meters
 HB =  60.96 meters
```

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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:45

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID        :                NO.2 STACK
Source Height    :    67.00 feet  [  20.42 meters]
Source Diameter  :     6.50 feet  [   1.98 meters]

INPUT SITE COORDINATES:
 Easting     :   515.00 feet  [ 156.97 meters]
 Northing    :   145.00 feet  [  44.20 meters]

ROTATED SITE COORDINATES:
 Easting     :   324.03 feet  [  98.77 meters]
 Northing    :   425.74 feet  [ 129.76 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR    PW    HB       DOMINANT STRUCTURE    ! DIR    PW      HB       DOMINANT STRUCTURE
deg    m     m                              ! deg    m       m
--------------------------------------------------------------------------------------------
 23    58.9  61.0             H-DIGESTER    !  202    58.9  61.0                H-DIGESTER
 45    39.4  22.9    I-NO.3 POWER BOILER    !  225    39.4  22.9       I-NO.3 POWER BOILER
 67    43.5  48.8     N-RECOVERY BOILERS    !  247    43.5  48.8        N-RECOVERY BOILERS
 90    50.1  48.8     N-RECOVERY BOILERS    !  270    50.1  48.8        N-RECOVERY BOILERS
113    51.7  48.8     N-RECOVERY BOILERS    !  292    51.7  48.8        N-RECOVERY BOILERS
135    34.2  48.8    C-NO.4 POWER BOILER    !  315    34.2  48.8       C-NO.4 POWER BOILER
157    37.4  48.8    C-NO.4 POWER BOILER    !  338    37.4  48.8       C-NO.4 POWER BOILER
180    75.2  61.0             H-DIGESTER    !  360    75.2  61.0                H-DIGESTER
--------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
      Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                 H-DIGESTER
 HL = HW = MPW * 0.886 =  71.10 meters
 HB =  60.96 meters
```

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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:45

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID        :              NO.1 STACK
Source Height    :    67.00 feet  [  20.42 meters]
Source Diameter  :     6.50 feet  [   1.98 meters]

INPUT SITE COORDINATES:
 Easting     :   540.00 feet  [ 164.59 meters]
 Northing    :   145.00 feet  [  44.20 meters]

ROTATED SITE COORDINATES:
 Easting     :   344.00 feet  [ 104.85 meters]
 Northing    :   440.78 feet  [ 134.35 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR    PW    HB        DOMINANT STRUCTURE      | DIR    PW       HB       DOMINANT STRUCTURE
deg    m     m                                 | deg    m        m
--------------------------------------------------------------------------------------------
 23    58.9  61.0              H-DIGESTER      |  202    58.9  61.0                H-DIGESTER
 45    39.4  22.9      I-NO.3 POWER BOILER     |  225    39.4  22.9       I-NO.3 POWER BOILER
 67    40.0  22.9      I-NO.3 POWER BOILER     |  247    40.0  22.9       I-NO.3 POWER BOILER
 90    50.1  48.8       N-RECOVERY BOILERS     |  270    50.1  48.8        N-RECOVERY BOILERS
113    51.7  48.8       N-RECOVERY BOILERS     |  292    51.7  48.8        N-RECOVERY BOILERS
135    34.2  48.8      C-NO.4 POWER BOILER     |  315    34.2  48.8       C-NO.4 POWER BOILER
157    37.4  48.8      C-NO.4 POWER BOILER     |  338    37.4  48.8       C-NO.4 POWER BOILER
180    75.2  61.0              H-DIGESTER      |  360    75.2  61.0                H-DIGESTER
--------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                 H-DIGESTER
 HL = HW = MPW * 0.886 =  71.10 meters
 HB =  60.96 meters
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:45

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID        :       RECOV BOILER STACK B
Source Height    :   181.77 feet  [  55.40 meters]
Source Diameter  :     8.99 feet  [   2.74 meters]

INPUT SITE COORDINATES:
 Easting     :    720.00 feet  [ 219.46 meters]
 Northing    :   -200.00 feet  [ -60.96 meters]

ROTATED SITE COORDINATES:
 Easting     :    695.38 feet  [ 211.95 meters]
 Northing    :    273.58 feet  [  83.39 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR   PW    HB        DOMINANT STRUCTURE      ¦ DIR    PW      HB        DOMINANT STRUCTURE
deg   m     m                                 ¦ deg    m       m
---------------------------------------------------------------------------------------------
 23   51.1  48.8       N-RECOVERY BOILERS  ¦  202    51.1  48.8        N-RECOVERY BOILERS
 45   46.6  48.8       N-RECOVERY BOILERS  ¦  225    46.6  48.8        N-RECOVERY BOILERS
 67   45.5  48.8     C-NO.4 POWER BOILER   ¦  247    41.5  61.0                H-DIGESTER
 90   64.6  61.0              H-DIGESTER   ¦  270    64.6  61.0                H-DIGESTER
113   51.7  48.8       N-RECOVERY BOILERS  ¦  292    51.7  48.8        N-RECOVERY BOILERS
135   51.1  48.8       N-RECOVERY BOILERS  ¦  315    51.1  48.8        N-RECOVERY BOILERS
157   53.1  48.8       N-RECOVERY BOILERS  ¦  338    53.1  48.8        N-RECOVERY BOILERS
180   53.3  48.8       N-RECOVERY BOILERS  ¦  360    53.3  48.8        N-RECOVERY BOILERS
---------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                  H-DIGESTER
 HL = HW = MPW * 0.886 =  71.10 meters
 HB =  60.96 meters
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:44

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID       :      RECOV BOILER STACK A
Source Height   :   181.77 feet  [  55.40 meters]
Source Diameter :     8.99 feet  [   2.74 meters]

INPUT SITE COORDINATES:
 Easting     :   805.00 feet  [ 245.36 meters]
 Northing    :  -200.00 feet  [ -60.96 meters]

ROTATED SITE COORDINATES:
 Easting     :   763.26 feet  [ 232.64 meters]
 Northing    :   324.73 feet  [  98.98 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR   PW    HB       DOMINANT STRUCTURE      ! DIR   PW     HB       DOMINANT STRUCTURE
deg   m     m                                ! deg   m      m
-------------------------------------------------------------------------------------------
 23   51.1  48.8       N-RECOVERY BOILERS    !  202   51.1  48.8       N-RECOVERY BOILERS
 45   23.1  30.5   N-PRECIPITATORS 2       * !  225   23.1  30.5   N-PRECIPITATORS 2      *
 67   45.5  48.8      C-NO.4 POWER BOILER    !  247   41.5  61.0              H-DIGESTER
 90   50.1  48.8       N-RECOVERY BOILERS    !  270   64.6  61.0              H-DIGESTER
113   51.7  48.8       N-RECOVERY BOILERS    !  292   51.7  48.8       N-RECOVERY BOILERS
135   51.1  48.8       N-RECOVERY BOILERS    !  315   51.1  48.8       N-RECOVERY BOILERS
157   53.1  48.8       N-RECOVERY BOILERS    !  338   53.1  48.8       N-RECOVERY BOILERS
180   53.3  48.8       N-RECOVERY BOILERS    !  360   53.3  48.8       N-RECOVERY BOILERS
-------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                H-DIGESTER
 HL = HW = MPW * 0.886 =  71.10 meters
 HB =  60.96 meters
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:               CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:44

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID        :            LIME KILN STACK
Source Height    :   136.00 feet  [  41.45 meters]
Source Diameter  :     6.50 feet  [   1.98 meters]

INPUT SITE COORDINATES:
 Easting     :   255.00 feet  [  77.72 meters]
 Northing    :  -695.00 feet  [-211.84 meters]

ROTATED SITE COORDINATES:
 Easting     :   621.91 feet  [ 189.56 meters]
 Northing    :  -401.59 feet  [-122.40 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR    PW    HB       DOMINANT STRUCTURE     | DIR    PW      HB       DOMINANT STRUCTURE
deg    m     m                               | deg    m       m
--------------------------------------------------------------------------------------------
 23     0.0   0.0           NO STRUCTURES  |  202     0.0   0.0            NO STRUCTURES
 45     0.0   0.0           NO STRUCTURES  |  225     0.0   0.0            NO STRUCTURES
 67     0.0   0.0           NO STRUCTURES  |  247     0.0   0.0            NO STRUCTURES
 90     0.0   0.0           NO STRUCTURES  |  270     0.0   0.0            NO STRUCTURES
113     0.0   0.0           NO STRUCTURES  |  292     0.0   0.0            NO STRUCTURES
135     0.0   0.0           NO STRUCTURES  |  315    80.2  61.0               H-DIGESTER
157     0.0   0.0           NO STRUCTURES  |  338    80.2  61.0               H-DIGESTER
180     0.0   0.0           NO STRUCTURES  |  360    53.3  48.8        N-RECOVERY BOILERS
--------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                 H-DIGESTER
 HL = HW = MPW * 0.886 =  71.10 meters
 HB =  60.96 meters
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:44

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID       :          COAL CRUSHER VENT
Source Height   :    100.00 feet  [  30.48 meters]
Source Diameter :      1.00 feet  [   0.30 meters]

INPUT SITE COORDINATES:
 Easting      :    395.00 feet  [ 120.40 meters]
 Northing     :   -622.00 feet  [-189.59 meters]

ROTATED SITE COORDINATES:
 Easting      :    689.79 feet  [ 210.25 meters]
 Northing     :   -259.03 feet  [ -78.95 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR    PW    HB       DOMINANT STRUCTURE     | DIR    PW       HB       DOMINANT STRUCTURE
deg    m     m                               | deg    m        m
---------------------------------------------------------------------------------------------

 23    26.4  15.2        G-LIME KILN SOUTH* |  202    26.4  15.2         G-LIME KILN SOUTH*
 45     0.0   0.0            NO STRUCTURES  |  225     0.0   0.0             NO STRUCTURES
 67     0.0   0.0            NO STRUCTURES  |  247     0.0   0.0             NO STRUCTURES
 90     0.0   0.0            NO STRUCTURES  |  270     0.0   0.0             NO STRUCTURES
113     0.0   0.0            NO STRUCTURES  |  292    77.9  61.0                H-DIGESTER
135     0.0   0.0            NO STRUCTURES  |  315    80.2  61.0                H-DIGESTER
157    26.6  15.2        G-LIME KILN SOUTH* |  338    37.4  48.8      C-NO.4 POWER BOILER
180    27.1  15.2        G-LIME KILN SOUTH* |  360    53.3  48.8       N-RECOVERY BOILERS
---------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                 H-DIGESTER
 HL = HW = MPW * 0.886 =  71.10 meters
 HB =  60.96 meters
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:              CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:44

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID        :              CALCINER STACK
Source Height   :   117.59 feet  [  35.84 meters]
Source Diameter :     4.00 feet  [   1.22 meters]

INPUT SITE COORDINATES:
 Easting     :   345.00 feet  [ 105.16 meters]
 Northing    :  -355.00 feet  [-108.20 meters]

ROTATED SITE COORDINATES:
 Easting     :   489.17 feet  [ 149.10 meters]
 Northing    :   -75.89 feet  [ -23.13 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR    PW    HB        DOMINANT STRUCTURE     ; DIR    PW      HB       DOMINANT STRUCTURE
deg    m     m                                ; deg    m       m
----------------------------------------------------------------------------------------------
 23    51.1  48.8      N-RECOVERY BOILERS  ;  202     36.3  21.3     A-LINE RECOVERY BLDG*
 45    63.8  22.9          E-EVAPORATORS* ;  225     36.3  21.3     A-LINE RECOVERY BLDG*
 67    40.2  21.3    A-LINE RECOVERY BLDG* ;  247     40.2  21.3     A-LINE RECOVERY BLDG*
 90    40.3  21.3    A-LINE RECOVERY BLDG* ;  270     54.4  27.4            V-CHIP SILOS
113    77.9  61.0              H-DIGESTER  ;  292     77.9  61.0              H-DIGESTER
135    80.2  61.0              H-DIGESTER  ;  315     80.2  61.0              H-DIGESTER
157    80.2  61.0              H-DIGESTER  ;  338     80.2  61.0              H-DIGESTER
180    33.0  21.3    A-LINE RECOVERY BLDG* ;  360     53.3  48.8      N-RECOVERY BOILERS
----------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                 H-DIGESTER
HL = HW = MPW * 0.886 =  71.10 meters
HB =  60.96 meters
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:             CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:43

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID       :                SLAKER STACK
Source Height   :    100.00 feet  [  30.48 meters]
Source Diameter :      1.00 feet  [   0.30 meters]

INPUT SITE COORDINATES:
 Easting       :   270.00 feet  [  82.30 meters]
 Northing      :  -390.00 feet  [-118.87 meters]

ROTATED SITE COORDINATES:
 Easting       :   450.34 feet  [ 137.26 meters]
 Northing      :  -148.98 feet  [ -45.41 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR    PW    HB       DOMINANT STRUCTURE     | DIR     PW      HB       DOMINANT STRUCTURE
deg    m     m                               | deg     m       m
-----------------------------------------------------------------------------------------------
 23    51.1  48.8       N-RECOVERY BOILERS   |  202    36.3  21.3     A-LINE RECOVERY BLDG
 45    63.8  22.9            E-EVAPORATORS   |  225    36.3  21.3     A-LINE RECOVERY BLDG
 67    40.2  21.3    A-LINE RECOVERY BLDG    |  247    56.1  27.4             V-CHIP SILOS
 90    18.1  15.2        F-LINE KILN NORTH*  |  270    54.4  27.4             V-CHIP SILOS
113    77.9  61.0               H-DIGESTER   |  292    77.9  61.0               H-DIGESTER
135    80.2  61.0               H-DIGESTER   |  315    80.2  61.0               H-DIGESTER
157    80.2  61.0               H-DIGESTER   |  338    80.2  61.0               H-DIGESTER
180    39.0  21.3    A-LINE RECOVERY BLDG    |  360    44.5  48.8      C-NO.4 POWER BOILER
-----------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                H-DIGESTER
 HL = HW = mPW * 0.886 =  71.10 meters
 HB =  60.96 meters
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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:             CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:43

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID        :                NO. 3 STACK
Source Height   :   150.00 feet  [  45.72 meters]
Source Diameter :     8.01 feet  [   2.44 meters]

INPUT SITE COORDINATES:
 Easting      :   415.00 feet  [ 126.49 meters]
 Northing     :    52.00 feet  [  15.85 meters]

ROTATED SITE COORDINATES:
 Easting      :   300.14 feet  [  91.48 meters]
 Northing     :   291.28 feet  [  88.78 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR    PW    HB       DOMINANT STRUCTURE      | DIR    PW      HB       DOMINANT STRUCTURE
deg    m     m                                | deg    m       m
-------------------------------------------------------------------------------------------
 23    58.9  61.0             H-DIGESTER      | 202    58.9  61.0              H-DIGESTER
 45    33.5  61.0             H-DIGESTER      | 225    33.5  61.0              H-DIGESTER
 67    41.5  61.0             H-DIGESTER      | 247    41.5  61.0              H-DIGESTER
 90    64.6  61.0             H-DIGESTER      | 270    64.6  61.0              H-DIGESTER
113    77.9  61.0             H-DIGESTER      | 292    77.9  61.0              H-DIGESTER
135    80.2  61.0             H-DIGESTER      | 315    80.2  61.0              H-DIGESTER
157    80.2  61.0             H-DIGESTER      | 338    80.2  61.0              H-DIGESTER
180    75.2  61.0             H-DIGESTER      | 360    75.2  61.0              H-DIGESTER
-------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                 H-DIGESTER
 HL = HW = MPW * 0.886 =  71.10 meters
 HB =  60.96 meters
```

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DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.            WORK ORDER NO.   22464301
RUN TITLE:               CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:43

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID        :                 NO. 4 STACK
Source Height    :   221.00 feet  [  67.36 meters]
Source Diameter  :    10.99 feet  [   3.35 meters]

INPUT SITE COORDINATES:
 Easting     :   535.00 feet  [ 163.07 meters]
 Northing    :   -85.00 feet  [ -25.91 meters]

ROTATED SITE COORDINATES:
 Easting     :   478.42 feet  [ 145.82 meters]
 Northing    :   254.09 feet  [  77.45 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR    PW    HG        DOMINANT STRUCTURE     | DIR    PW      HG        DOMINANT STRUCTURE
deg    m     m                                | deg    m       m
-------------------------------------------------------------------------------------------
 23    51.1  48.8        N-RECOVERY BOILERS   |  202    51.1  48.8        N-RECOVERY BOILERS
 45    46.6  48.8        N-RECOVERY BOILERS   |  225    46.6  48.8        N-RECOVERY BOILERS
 67    41.5  61.0                H-DIGESTER   |  247    41.5  61.0                H-DIGESTER
 90    64.6  61.0                H-DIGESTER   |  270    64.6  61.0                H-DIGESTER
113    77.9  61.0                H-DIGESTER   |  292    77.9  61.0                H-DIGESTER
135    34.2  48.8      C-NO.4 POWER BOILER    |  315    34.2  48.8      C-NO.4 POWER BOILER
157    37.4  48.8      C-NO.4 POWER BOILER    |  338    37.4  48.8      C-NO.4 POWER BOILER
180    44.5  48.8      C-NO.4 POWER BOILER    |  360    44.5  48.8      C-NO.4 POWER BOILER
-------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                 H-DIGESTER
 HL = HW = MPW * 0.886 =  71.10 meters
 HB =  60.96 meters
```

```
DOWNWASH ANALYSIS PROGRAM, VERSION  4.0X, February 1991
ROY F. WESTON, INC.          WORK ORDER NO.   22464301
RUN TITLE:             CHAMPION PENSICOLA  * PROGRAM RUN  2/15/91 AT 15:42

DWA:  DOMINANT STRUCTURES AND DIMENSIONS FOR SOURCE

Source ID        :              NO. 5 STACK
Source Height    :    46.90 feet  [  14.30 meters]
Source Diameter  :     4.00 feet  [   1.22 meters]

INPUT SITE COORDINATES:
 Easting     :   622.00 feet  [ 189.59 meters]
 Northing    :   236.00 feet  [  71.93 meters]

ROTATED SITE COORDINATES:
 Easting     :   354.72 feet  [ 108.12 meters]
 Northing    :   562.81 feet  [ 171.54 meters]

DOWNWASH ALGORITHM REQUIRED :  Schulman-Scire

DIRECTION-SPECIFIC WIDTHS, HEIGHTS, AND DOMINANT STRUCTURES FOR THIS SOURCE,
BASED ON EPA GUIDANCE RECTANGULAR AREAS OF EFFECT FOR STRUCTURES:

DIR    PW     HB       DOMINANT STRUCTURE      | DIR    PW     HB       DOMINANT STRUCTURE
deg    m      m                                | deg    m      m
----------------------------------------------------------------------------------------------
 23    58.9  61.0                 H-DIGESTER   |  202    58.9  61.0                 H-DIGESTER
 45   179.3  18.3   D-NO. 5 PAPER MACHINE      |  225   179.3  18.3   D-NO. 5 PAPER MACHINE
 67   175.6  18.3   D-NO. 5 PAPER MACHINE      |  247   175.6  18.3   D-NO. 5 PAPER MACHINE
 90   170.5  18.3   D-NO. 5 PAPER MACHINE      |  270   170.5  18.3   D-NO. 5 PAPER MACHINE
113    51.7  48.8        N-RECOVERY BOILERS    |  292    51.7  48.8        N-RECOVERY BOILERS
135    51.1  48.8        N-RECOVERY BOILERS    |  315    51.1  48.8        N-RECOVERY BOILERS
157    37.4  48.8       C-NO.4 POWER BOILER    |  338    37.4  48.8       C-NO.4 POWER BOILER
180    75.2  61.0                 H-DIGESTER   |  360    75.2  61.0                 H-DIGESTER
----------------------------------------------------------------------------------------------
NOTES: DIR represents a wind direction, NOT A FLOW VECTOR.
       Asterisks mark structures producing only Huber-Snyder effects in ISC.


INFLUENCING STRUCTURE WITH MAXIMUM FORMULA GEP HEIGHT:

                 H-DIGESTER
 HL = HW = MPW * 0.886 =  71.10 meters
 HB =  60.96 meters
```

APPENDIX C

Boiler No. 5 Reconstruction Letter

ch12591.jb

PC-1129

Champion
Champion International Corporation

November 5, 1987

Mr. Pradeep Raval
Florida Department of Environmental
  Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Raval:

Enclosed are two documents which we discusssed by telephone today. First is the original ASME Form P3 showing that the rental package boiler was built in 1964. The current owner of the boiler, Holman Boiler Works, Inc., replaced the tubes in the boiler in 1982. This was the last major work done on the boiler. The burner supplier, Coen, is currently rebuilding the burner to meet the .2 lb/MM Btu NOx requirement.

The second document is a page from a performance guarantee for a boiler which our Quinnesec, Michigan mill is installing as part of an expansion at that facility. This performance guarantee is for a low NOx burner which should have the same CO emissions as the standard burner which will be installed in a package boiler we are renting. The guarantee showed a CO value of 175 parts/million which for that particular boiler at its flow rate calculates as .22 lb CO/MM Btu heat input. Champion is in the process of getting a guarantee from Coen for the burner that will be installed in the package boiler we are renting. We expect that number to be .24 lb/MM Btu heat input, which should be the value in the construction permit.

If there are any questions concerning this information, please contact me at the mill.

Sincerely,

David T. Arceneaux

DTA/hs

Attachments

cc: Mr. Thomas Moody - DER, Pensacola
    Mr. William Thomas - DER, Tallahassee

...SUPERHEATERS, AND ECONOMIZERS

As Required by the Provisions of the ASME Code Rules

1. Manufactured by WICKES BOILER COMPANY SAGINAW, MICHIGAN
(Name and address of manufacturer)

2. Manufactured for U.S. NAVY - U.S. NAVAL BASE GUANTANAMO BAY, CUBA
(Name and address of purchaser)

3. Identification BENT TUBE BOILER Boiler No. (4020-1 ASME-6030 2889 Year Built 1964
(Type of boiler, superheater, waterwall, economizer) (Mfrs. Serial No.) ~~[illegible]~~ (Natl. Board No.)

4. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules SECTION I

Remarks: Manufacturers' Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report: NONE
(Name of Part, item number, manufacturer's name, and identifying stamp)

We certify the statement in this data report to be correct.

Date May 4, 19 64 Signed WICKES BOILER COMPANY By
(Manufacturer) (Representative)

Certificate of Authorization Expires December 31, 19 64

CERTIFICATE OF SHOP INSPECTION

BOILER MADE BY WICKES BOILER COMPANY at SAGINAW, MICHIGAN

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State of ______ and employed by HARTFORD STM. BLR. INSP. & INS. of HARTFORD, CONNECTICUT have inspected parts of this boiler referred to as data items 5a, 5b, 7a, 7b, 8a, 8b, 9a, 10, 11a, 11c, 11d and have examined manufacturer's partial data reports for items ______ and state that, to the best of my knowledge and belief, the manufacturer has constructed this boiler in accordance with the applicable sections of the ASME BOILER AND PRESSURE VESSEL CODE.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the boiler described in this manufacturer's data report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date May 6th 19 64

W. S. Carmichael Commission N.B. 1423
Inspector Nat'l Board or State and No.

We certify that the field assembly of all parts of this boiler conforms with the requirements of SECTION I of the ASME BOILER AND PRESSURE VESSEL CODE.

Date ______ 19 ___ Signed ______ By ______
(Assembler) (Representative)

Our Certificate of Authorization to use the ______ Symbol expires ______ 19
(A) or (S)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State of ______ and employed by ______ of ______ have compared the statements in this manufacturer's data report with the described boiler and state that the parts referred to as data items 7b, 12, not included in the certificate of shop inspection have been inspected by me and that to the best of my knowledge and belief the manufacturer and/or the assembler has constructed and assembled this boiler in accordance with the applicable sections of the ASME BOILER AND PRESSURE VESSEL CODE. The described boiler was inspected and subjected to a hydrostatic test of 1,163 psi.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the boiler described in this manufacturer's data report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date ______ 19 ___

______ Commission ______
Inspector Nat'l Board or State and No.

Printed in U.S.A. (1/64) Copies of this Form obtainable from the ASME, 345 E. 47th St., New York, N.Y., 10017

No.	Nominal diameter in.	Length Ft	In.	Shell plates Brand	Material spec. no.	Thickness	Inside radius	Tube sheets Thickness	Inside radius	Tube hole ligament efficiency % Longitudinal	Circumferential
1	18 OD	34-	11-3/4	Seamless	SA-106-B	1.156"	7.844"	1.156"	7.844"	43.0	26.6
2	18 OD	34-	11-3/4	Seamless	SA-106-B	1.156"	7.844"	1.156"	7.844"	43.0	26.6
3	42 ID	36-	10	FB	SA-212-B	1-29/32"	21"	1-29/32"	21"	49.2	32.3
3 4	41-3/4 ID			FB	SA-212-B	2-1/32"	20¼"	2-1/32"	20¼"		
5											

No.	Longitudinal joint No. & type*	Efficiency %	Circum. joint No. & type	Efficiency %	Heads * OVAL HANDHOLES Brand	Material spec. no.	Thickness		Type**	Radius of dish	Manholes No. Size	Hydrostatic test, lb
1	0-1	100	--	--	FB	SA-212-B	3"	3"	1	--	*2-4½"x5½"	1050
2	0-1	100	--	--	FB	SA-212-B	3"	3"	1	--	*2-4½"x5½"	1050
3	1-2	100	4-2	100	FB	SA-212-B	1-29/32"	1-29/32"	3	Ellip.	2-12"x16"	1050
4												
5												

* Indicate if 1. Seamless; 2. Fusion welded; 3. Forge welded; 4. Riveted.

** Indicate if 1. Flat; 2. Dished; 3. Ellipsoidal; 4. Hemispherical.

5(b) Boiler Tubes

Diameter	Thickness	Material specification no.
2"	.105"	SA-178-A ERW
2"	.150"	SA-178-A ERW

(5c) Headers No. .... (Box or sinuous; Mat. spec. no.; Thickness)

Heads or Ends .... (Shape; Mat. spec. no.; Thickness) Hydro. Test Lb. ....

5(d) Staybolts .... (Mat. spec. no.; Diameter; Size telltale; Net area)

Pitch .... Net Area .... (Supported by one bolt) Max. S.W.P. ....

5(e) Mud Drum .... (For sect. header boilers. State size; Shape; Mat. spec. no.; Thickness) Heads or Ends .... (Shape; Mat. spec. no.; Thickness) Hydro. Test Lb. ....

6(a) Waterwall Headers / 6(b) Waterwall Tubes

No.	Size and shape	Material spec. no.	Thickness	Heads or Ends Shape	Thickness	Material spec. no.	Hydro. test, lb	Diameter	Thickness	Material spec. no.

7(a) Economizer Headers / 7(b) Economizer Tubes

2	8⅝" OD	SA-106-B	0.718"	1-0	29/32"-0"	SA-212-B	1163	2"	.180"	SA178A ERW

8(a) Superheater Headers / 8(b) Superheater Tubes

2	8⅝" OD	(SA-106-B	0.718")	1-0	29/32"-0"	SA-212-B	1050	2"	.150"	SA178A ERW
1	8"	(SA-53	Sch. 80)				1050	2"	.180"	SA213T/11
1	8"	SA-53	Sch. 80	Superheater	inlet	pipe	1050			

9(a) Other Parts (1) PIPING (2) .... (3) .... 9(b) Tubes for Other Parts

NO CONNECTIONS TO ITEM 10 EXCEPT:

a	4 - 1½"	SA-53	Sch. 80	2-B.O. Pipes	2-W.C. Pipes		1050			
b	1 - 2"	SA-53	Sch. 80	Soot Blower	Pipe		1050			
c	2 - 4"	SA-53	Sch. 80	Economizer	Pipes		1163	1-1½"Frg.Flg.S.V.Noz.-		

10 Openings (1) Steam 1 - 8" Studded Pad (No., size, and type of nozzles or outlets) (2) Safety valve 2-2½"Studded Pads (drum) (No., size, and type of nozzles or outlets)

(3) Blow off 2 - 1½" Socketweld Connections (No., size, and type of nozzle or outlet) (4) Feed 1-4"Frg.Flg.Noz.R.H.Side #3 Drum (No., size, type, and location of connections)

11		Bursting pressure weakest part	Maximum S.W.P.	Factor of safety	Shop hydro. test	Heating surface
a	Boiler	2964	700	4.23	1050	10,269
b	Waterwall					
c	Economizer	3528	775	4.55		5,270
d	Superheater	3528	700	5.04	1050	1,243

Heating surface to be stamped on drum heads. This heating surface not to be used for determining minimum relief valve capacity.

12 Field hydro. test
1163