STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

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

A029-203511

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

Source Type: Air Pollution Renewal of DER Permit No. A029-125993

Company Name: Tampa Electric Company County: Hillsborough

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):

Gannon Station Unit Five

Source Location: Street: Port Sutton Road City: Tampa

UTM: East 360.000 North 3,087.500

Latitude: 27° 54' 25"N. Longitude: 82° 25' 21"W.

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

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

3. Attach the last compliance test report required per permit conditions if not submitted previously. Submitted 3/28/91

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

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

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

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

... applicable:

A. Raw Materials and Chemical Used in Your Process: Not Applicable

Description	Contaminant Type	Contaminant Wt	Utilization Rate lbs/hr

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

C. Fuels

Type (Be Specific)	Consumption* Avg/hr*	Consumption* Max/hr**	Maximum Heat Input (MMBTU/hr)
Coal	153,973*	186,800	2284

D. Normal Equipment Operating Time: hrs/day 24; days/wk 7; wks/yr 52; hrs/yr (power plants only) 8760; if seasonal, describe _____

* Average value, 1989 and 1990 emissions inventories

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

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

Lynn F. Robinson
Signature, Owner or Authorized Representative (Notarization is mandatory)

Lynn F. Robinson, Manager, Environmental Planning
Typed Name and Title

P.O. Box 111
Address

Tampa FL 33601-0111
City State Zip

10/04/91 (813) 228-4841
Date Telephone No.

STATE OF FLORIDA
COUNTY OF HILLSBOROUGH

Sworn to and subscribed before me this 4th day of October, 1991.

Diana R. Hafer
Notary Public
Commission Expires

DIANA R. HAFER NOTARY PUBLIC
NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXP. DEC. 4, 1993
BONDED THRU GENERAL INS. UND.

Professional Engineer in Florida (as required by Subsection 17-4.05(3), F.A.C.)

This is to certify that the engineering features of this air pollution control project have been ~~designed~~/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgement, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statuates of the State of Florida and the rules and the regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintainance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed David W. Ross

Date: 10-2-91 Telephone No. 228-4111

David W. Ross
Name (Please type)

Tampa Electric Company
Company Name (Please type)

Affix seal here

P.O. Box 111, Tampa, FL 33601-0111
Mailing Address (Please Type)

Florida Registration No. 42720

This certification is only applicable for the permit renewal application of Tampa Electric Company's F.J. Gannon Station Unit 5.

F.J. Gannon Station - Unit #5

Operation and Maintenance Plan for the
Processing System and Particulate Control/Collection System

INTRODUCTION

F.J. Gannon Station is owned and operated by Tampa Electric Company. The station is located on the eastern shore of Hillsborough Bay at Port Sutton. The station consists of six coal fired, steam electric generating units.

Unit 5 was placed in service in 1965. The boiler was manufactured by the Riley Stoker Corporation and is of the "wet" bottom, opposed firing type. Boiler exhaust gases pass through electrostatic precipitators prior to discharge through a 306 foot stack.

PROCESS SYSTEM PERFORMANCE PARAMETERS

The Unit 5 boiler burns low sulfur pulverized coal. The design fuel consumption at maximum continuous rating is 93.4 tons/hr., operating pressure is 2250 psi and operating temperature is 1000°F. Pressure and temperature are continuously monitored and recorded on control room charts.

The maximum design steam capacity of the boiler is 1,660,000 pounds per hour. Steam flow is recorded on a continuous basis.

PARTICULATE CONTROL EQUIPMENT DATA

Gannon Unit 5 is equipped with two electrostatic precipitators for the control of particulate emissions. The two precipitators, model numbers G.O. 3129 and G.O. 2791 were manufactured by Research Cottrell, Inc. Fly ash collected by the precipitators is either pneumatically transported to a storage silo for sale or reinjected into the boiler. Fly ash is reinjected into the boiler when the silo approaches its maximum storage capacity. Important design information and data applicable to the particulate control system are listed below.

Precipitator Data	G.O. 3129	G.O. 2791
Design Flow Rate	820,000 cfm	700,000 cfm
Primary Voltage	400 volts	400 volts
Primary Current	240 amps	195 amps
Secondary Voltage	53.5 kilovolts	64.5 kilovolts
Secondary Current	1500 milliamps	1000 milliamps
Design Efficiency	99.78%	98.5%
Pressure Drop	0.5 inches of H_2O (avg.)	0.5 inches of H_2O (avg.)
Static Pressure	+15 inches of H_2O (avg.)	+15 inches of H_2O (avg.)
Rapper Frequency	1/2.0 minutes (avg.)	1/2.0 minutes (avg.)
Rapper Duration	Impact	Impact
Temperature	293°F (avg.)	289°F (avg.)

Precipitator (ESP) performance parameters are recorded routinely on a daily basis. The information recorded includes primary voltage, primary current and secondary current. Fly ash hopper high levels are alarmed in the control room.

MAINTENANCE AND INSPECTION SCHEDULES

All generating units of the Tampa Electric Company system are regularly scheduled for periodic maintenance. The schedule for planned maintenance outages is affected by system load and forced outage requirements. Typically, planned outages are scheduled during non-peak load periods such as the spring or fall.

The Unit 5 particulate control system receives regular preventive maintenance. The following preventive maintenance procedures are performed on an monthly basis.

- Inspect penthouse pressurizing fan filters. Replace as needed.
- Check rapper and transformer/rectifier controls.

The following preventive maintenance procedures are performed on a daily basis.

- Inspection of system controls. Make minor adjustments as needed.
- Rapper operation is checked daily through automated system controls.

Should these procedures indicate repairs are necessary, maintenance job requests are initiated. All records are maintained for a minimum of two years.

1.0 SUMMARY OF RESULTS

On February 13, 1991, the Central Testing Laboratory of Tampa Electric Company performed source emission tests on Boiler No. 5 at the F. J. Gannon Electrical Generating Station. Testing was conducted according to procedures stipulated by the Florida Department of Environmental Regulation (FDER) for fossil fuel steam generators.

Particulate emission rates, under sootblowing conditions, were derived from three test runs. They calculated to be an average of 0.04 pounds of particulate matter per million Btu ($lb/10^6$ Btu) heat input to the boiler. The FDER allowable emission rate is 0.3 $lb/10^6$ Btu. Particulate emission rates, under non-sootblowing conditions, were also derived from three test runs. They calculated to be an average of 0.04 pounds of particulate matter per million Btu ($lb/10^6$ Btu) heat input to the boiler. The FDER allowable emission rate is 0.1 $lb/10^6$ Btu.

Sulfur dioxide (SO_2) emission rates were derived from three test runs. They calculated to be an average of 1.9 $lb/10^6$ Btu. The FDER allowable rate is 2.4 $lb/10^6$ Btu.

A visible emission test was performed during sootblowing conditions. The average opacity observed during the one hour test was 5 percent.

During the tests on February 13, 1991, the boiler was operated at an average load of 244.9 megawatts. Details of boiler operation are included in Appendix C.

TAMPA ELECTRIC
A TECO ENERGY COMPANY

October 8, 1986

RE: Gannon Station Unit No. 5 - Air Operations Permit Renewal Application

TO WHOM IT MAY CONCERN:

Please be advised that A. Spencer Autry, Manager of Environmental Planning, is the authorized representative of Tampa Electric Company concerning matters with which this permit application deals.

Very truly yours,

Heywood G. Turner

Heywood A. Turner
Senior Vice President
Production

HAT/tb

TAMPA ELECTRIC COMPANY
P.O. Box 111 Tampa, Florida 33601 (813) 228-4111

A029-125993

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

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

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

Source Type: Air Pollution Renewal of DER Permit No. A029-47728

Company Name: Tampa Electric Company County: Hillsborough

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):

Gannon Station Unit 5

Source Location: Street: Port Sutton Road City: Tampa

UTM: East 360,000 North 3,087,500

Latitude: 27° 54' 25"N. Longitude: 82° 25' 21"W.

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

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

3. Attach the last compliance test report required per permit conditions if not submitted previously. Submitted 8/28/86.

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

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

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

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

1. Please provide the following information if applicable:

A. Raw Materials and Chemical Used in Your Process: Not Applicable

Description	Contaminant Type	%Wt	Utilization Rate	lbs/hr

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

C. Fuels

Type (Be Specific)	Consumption* Avg/hr*	LBS/HR Max/hr**	Maximum Heat Input (MMBTU/hr)
Coal	144,600*	186,800	2284

D. Normal Equipment Operating Time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

hrs/yr (power plants only) 8760 if seasonal, describe _____

*Average value, 1984 and 1985 emissions inventories.

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

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

Signature, Owner or Authorized Representative
(Notarization is mandatory)

A. Spencer Autry, Manager, Environmental Planning
Typed Name and Title

P.O. Box 111
Address

Tampa, Florida 33601
City, State Zip

10/8/86
Date

813/228-4111
Telephone No.

Sworn to and subscribed before me this 8th day of October, 19 86.

NOTARY PUBLIC, STATE OF FLORIDA
MY COMMISSION EXP. NOV 14,1989
BONDED THRU GENERAL

ER Form 17-1.202(4)
Effective November 30, 1982

F.J. GANNON STATION - UNIT #5

Operation and Maintenance Plan for the
Processing System and Particulate Control/Collection System

INTRODUCTION

F.J. Gannon Station is owned and operated by Tampa Electric Company. The station is located on the eastern shore of Hillsborough Bay at Port Sutton. The station consists of six coal fired, steam electric generating units.

Unit 5 was placed in service in 1965. The boiler was manufactured by the Riley Stoker Corporation and is of the "wet" bottom, opposed firing type. Boiler exhaust gases pass through electrostatic precipitators prior to discharge through a 306 foot stack.

PROCESS SYSTEM PERFORMANCE PARAMETERS

The Unit 5 boiler burns low sulfur pulverized coal. The design fuel consumption at maximum continuous rating is 93.4 tons/hr., operating pressure is 2250 psi and operating temperature is 1000°F. Pressure and temperature are continuously monitored and recorded on control room charts.

The maximum design steam capacity of the boiler is 1,660,000 pounds per hour. Steam flow is recorded on a continuous basis.

PARTICULATE CONTROL EQUIPMENT DATA

Gannon Unit 5 is equipped with two electrostatic precipitators for the control of particulate emissions. The two precipitators, model numbers G.O. 3129 and G.O. 2791 were manufactured by Research Cottrell, Inc. Fly ash collected by the precipitators is either pneumatically transported to a storage silo for sale or reinjected into the boiler. Fly ash is reinjected into the boiler when the silo approaches its maximum storage capacity. Important design information and data applicable to the particulate control system are listed below.

Precipitator Data	G.O. 3129	G.O. 2791
Design Flow Rate	820,000 cfm	700,000 cfm
Primary Voltage	430-480 volts	430-460 volts
Primary Current	241 amps	152 amps
Secondary Voltage	53.5 kilovolts	53.5 kilovolts
Secondary Current	1500 milliamps	1000 milliamps
Design Efficiency	99.78%	98.5%
Pressure Drop	0.5 inches of H_2O (average)	0.5 inches of H_2O (average)
Static Pressure	+15 inches of H_2O (average)	+15 inches of H_2O (average)
Rapper Frequency	1/2.0 minutes (average)	1/2.0 minutes (average)
Rapper Duration	Impact	Impact
Temperature	293°F (average)	289°F (average)

Precipitator (ESP) performance parameters are recorded routinely on a daily basis. The information recorded includes primary voltage, primary current and secondary current. This information is kept in the precipitator technician's office. Fly ash hopper high levels are alarmed in the control room.

MAINTENANCE AND INSPECTION SCHEDULES

All generating units of the Tampa Electric Company system are regularly scheduled for periodic maintenance. The schedule for planned maintenance outages is affected by system load and forced outage requirements. Typically, planned outages are scheduled during non-peak load periods such as the spring or fall.

The Unit 5 particulate control system receives regular preventive maintenance. The following preventive maintenance procedures are performed on a monthly basis.

- Inspect penthouse pressurizing fan filters. Replace as needed.
- Observe operation of all rappers and vibrators. Check rapper and transformer/rectifier controls.

The following preventive maintenance procedures are performed on a daily basis.

- Inspection of system controls. Make minor adjustments as needed.

Should these procedures indicate repairs are necessary, maintenance job requests are initiated. All records are maintained for a minimum of two years.

67726

63-27
631

CHECK NO. 67726

TAMPA ELECTRIC
A TECO ENERGY COMPANY

POST OFFICE BOX 111
TAMPA, FLORIDA 33601

PAY:

DATE 10 08 86

THREE HUNDRED FORTY FIVE AND NO/100 ** DOLLARS **********

$ ********345.00

TO THE ORDER OF HILLSBOROUGH COUNTY BOARD OF COUNTY COMMISSIONERS

ONLY ONE SIGNATURE REQUIRED ON CHECKS OF $2500.00 OR LESS

NCNB NATIONAL BANK OF FLORIDA • TAMPA, FLORIDA

[redacted]

THE ACCOMPANYING CHECK IS IN FULL PAYMENT OF ITEMS BELOW - DETACH BEFORE CASHING

INVOICE NO.	DATE	VOUCHER	GROSS AMOUNT	DISCOUNT	NET AMOUNT
100686	100686	226886	PERMIT 345.00		345.00

CHECK NO.	DATE	VENDOR NO.	VENDOR NAME	TOTAL AMOUNT
-S- 67726	100886	HIL076	HILLSBOROUGH COUNTY B	345.00

TAMPA ELECTRIC COMPANY • P.O. BOX 111 TAMPA, FL. 33601 • (813) 228-4111

2 67723

CHECK NO. 67723

63-27
631

TAMPA ELECTRIC
A TECO ENERGY COMPANY

POST OFFICE BOX 111
TAMPA, FLORIDA 33601

PAY:

DATE 10 08 86

FIVE HUNDRED AND NO/100 DOLLARS ****** $ ********500.00

TO THE ORDER OF FLORIDA DEPT OF ENVIRONMENTAL REGULATION

J. Y. Woodward

ONLY ONE SIGNATURE REQUIRED ON CHECKS OF $2000.00 OR LESS

NCNB NATIONAL BANK OF FLORIDA • TAMPA, FLORIDA

[redacted]

THE ACCOMPANYING CHECK IS IN FULL PAYMENT OF ITEMS BELOW - DETACH BEFORE CASHING

INVOICE NO.	DATE	VOUCHER	GROSS AMOUNT	DISCOUNT	NET AMOUNT
100686	100686	226888	PERMIT 500.00		500.00

CHECK NO.	DATE	VENDOR NO.	VENDOR NAME	TOTAL AMOUNT
-S- 67723	100886	FL0004	FLORIDA DEPT OF ENVIR	500.00

TAMPA ELECTRIC COMPANY • P.O. BOX 111 TAMPA, FL. 33601 • (813) 228-4111

A029-47728

D.E.R.
SEP 17 1981
SOUTHWEST DISTRICT
TAMPA

PAID SEP 17 1981

RECEIVED
SEP 15 1981
L.C.E.P.C.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: AIR POLLUTION [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Tampa Electric Company COUNTY: Hillsborough

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

SOURCE LOCATION: Street Port Sutton Road City Tampa

UTM: East 360,000 North 3,087,500

Latitude 27 ° 54 ' 25 "N Longitude 82 ° 25 ' 21 "W

APPLICANT NAME AND TITLE: Tampa Electric Company

APPLICANT ADDRESS: P.O. Box 111, Tampa, Florida 33601

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Tampa Electric Company

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

*Attach letter of authorization

Signed: Jerry L. Williams

Jerry L. Williams, Manager Environmental Planning
Name and Title (Please Type)

Date: 9-15-81 Telephone No. 813/228-4111

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

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed: William N. Cantrell

William N. Cantrell
Name (Please Type)

(Affix Seal)

Tampa Electric Company
Company Name (Please Type)

P. O. Box 111, Tampa, Florida 33601
Mailing Address (Please Type)

Florida Registration No. 23494 Date: 9-15-81 Telephone No. 813/228-4111

[1]See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

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.

The source is a coal fired boiler which generates steam to drive a turbine and produce electricity. An electrostatic precipitator and low sulfur coal are utilized to achieve compliance.

B. Schedule of project covered in this application (Construction Permit Application Only) Not Applicable

Start of Construction _____ Completion of Construction _____

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Stack Extension (Units 1-5)	$2,337,000
Precipitator Upgrade	$4,902,000

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

A029-5630	Sept. 13, 1977 - July 31, 1978
A029-7102	Sept. 27, 1978 - July 1, 1983

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

F. Normal equipment operating time: hrs/day __24__ ; days/wk __7__ ; wks/yr __52__ ; if power plant, hrs/yr __*__ ; if seasonal, describe: Not Applicable

G. If this is a new source or major modification, answer the following questions. (Yes or No) Not Applicable

1. Is this source in a non-attainment area for a particular pollutant?
   a. If yes, has "offset" been applied?
   b. If yes, has "Lowest Achievable Emission Rate" been applied?
   c. If yes, list non-attainment pollutants.
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI.
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirements apply to this source? If yes, see Sections VI and VII.
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source?
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source?

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

* Variable

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

A. Raw Materials and Chemicals Used in your Process, if applicable: Not Applicable

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

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

1. Total Process Input Rate (lbs/hr): See Section III-F

2. Product Weight (lbs/hr): Not Applicable

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual* T/yr			lbs/hr	T/yr	
Sulfur Dioxide	5482	9206	2.4 lbs/MMBTU	5482	5482	24,009	Fig 1
Particulates	228.4	58	0.1 lbs/MMBTU	228.4	114200	500,196	

* From 1980 Emission Inventory

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]
Electrostatic Precipitator	Particulate	99.8	N.A.	Design

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard

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

[5]If Applicable

E. Fuels From 1980 Emission Inventory

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Coal	166,020	186,800	2284

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, lbs/hr

Fuel Analysis:

Percent Sulfur: 1.3% Percent Ash: 9.5

Density: Not Applicable lbs/gal Typical Percent Nitrogen: 1.3

Heat Capacity: 12,500 BTU/lb Not Applicable BTU/gal

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

F. If applicable, indicate the percent of fuel used for space heating. Annual Average N/A Maximum N/A

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

Fly Ash- Collected and Pneumatically transferred to a storage silo for sale or reinjected into the boiler. Slag - Hydraulically sluiced to dewatering bins for sale.

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

Stack Height: 306 ft. Stack Diameter: 14.6 ft.

Gas Flow Rate: 681,000 ACFM Gas Exit Temperature: 288 °F.

Water Vapor Content: 5.2 % Velocity: 67.8 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.)
Lbs/hr Incinerated							

Description of Waste _____

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

Approximate Number of Hours of Operation per day _____ days/week _____

Manufacturer _____

Date Constructed _____ Model No. _____

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

Stack Height: _____ ft. Stack Diameter _____ Stack Temp. _____

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

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

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner [ ] Other (specify) _____

Brief description of operating characteristics of control devices: _____

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight – show derivation.
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.,) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, etc.).
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3, and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8½" 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 FIGURE 1
7. An 8½" 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 3
8. An 8½" 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

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

NOT APPLICABLE

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [ ] Yes [ ] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions:

Contaminant	Rate or Concentration

*Explain method of determining D 3 above.

10. Stack Parameters

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F

e. Velocity: FPS

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

1.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy*: 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*: d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy**: h. Maintenance Costs:

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:

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power – KWH design rate.

3.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Life: f. Operating Cost:

g. Energy: h. Maintenance Cost:

*Explain method of determining efficiency above.

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*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected:

1. Control Device:
2. Efficiency*:
3. Capital Cost:
4. Life:
5. Operating Cost:
6. Energy:
7. Maintenance Cost:
8. Manufacturer:
9. Other locations where employed on similar processes:

a.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

*Explain method of determining efficiency above.

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

b.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

10. Reason for selection and description of systems:

*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

NOT APPLICABLE

A. Company Monitored Data

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.

2. Instrumentation, Field and Laboratory

a) Was instrumentation EPA referenced or its equivalent? _____ Yes _____ No

b) Was instrumentation calibrated in accordance with Department procedures? _____ Yes _____ No _____ Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ___/___/___ to ___/___/___
month day year month day year

2. Surface data obtained from (location) _____

3. Upper air (mixing height) data obtained from (location) _____

4. Stability wind rose (STAR) data obtained from (location) _____

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

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

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	_____ grams/sec
SO^2	_____ grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description on 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.

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

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

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

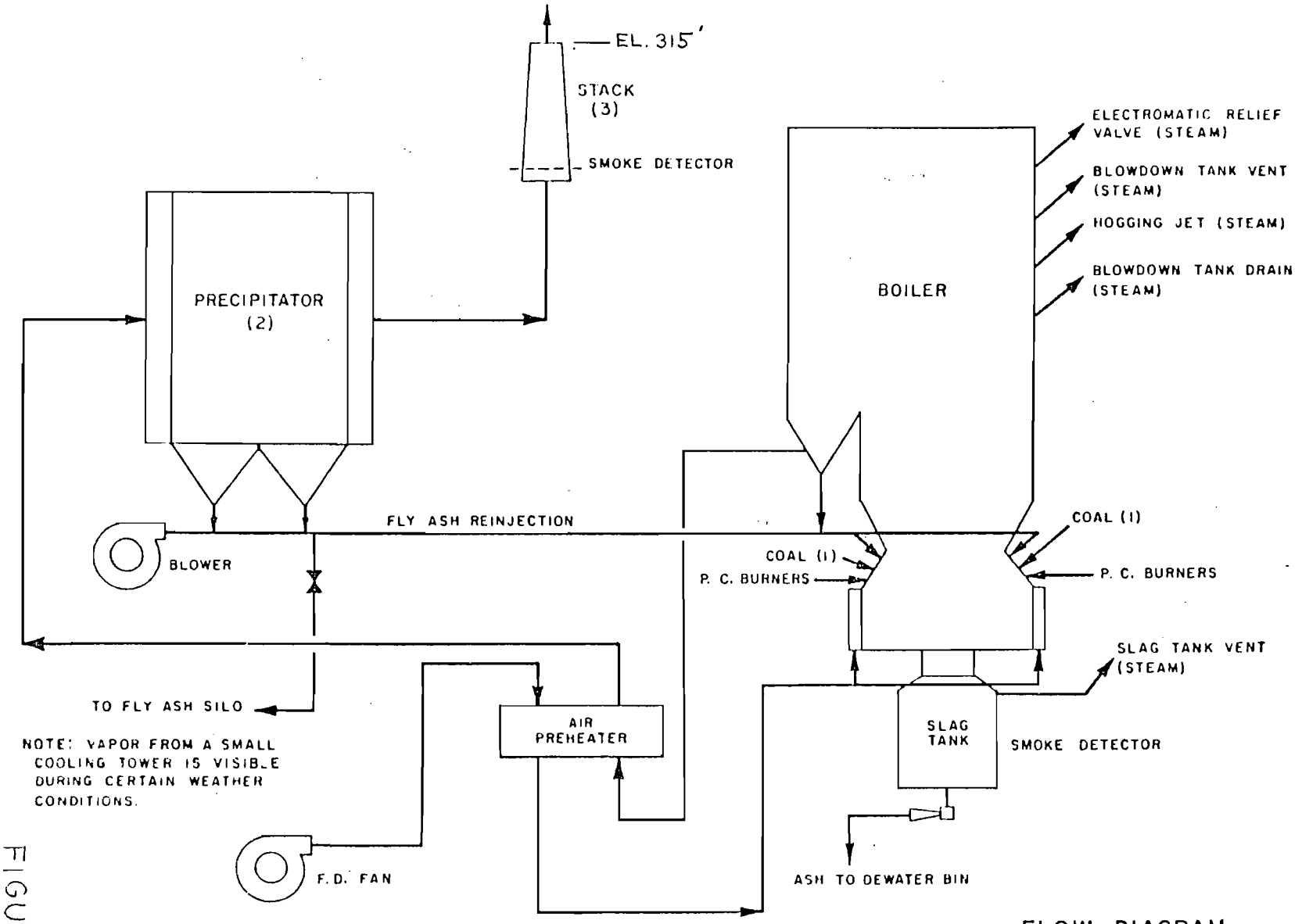

FIGURE 1

FLOW DIAGRAM
GANNON STATION-UNIT 5
TAMPA ELECTRIC COMPANY

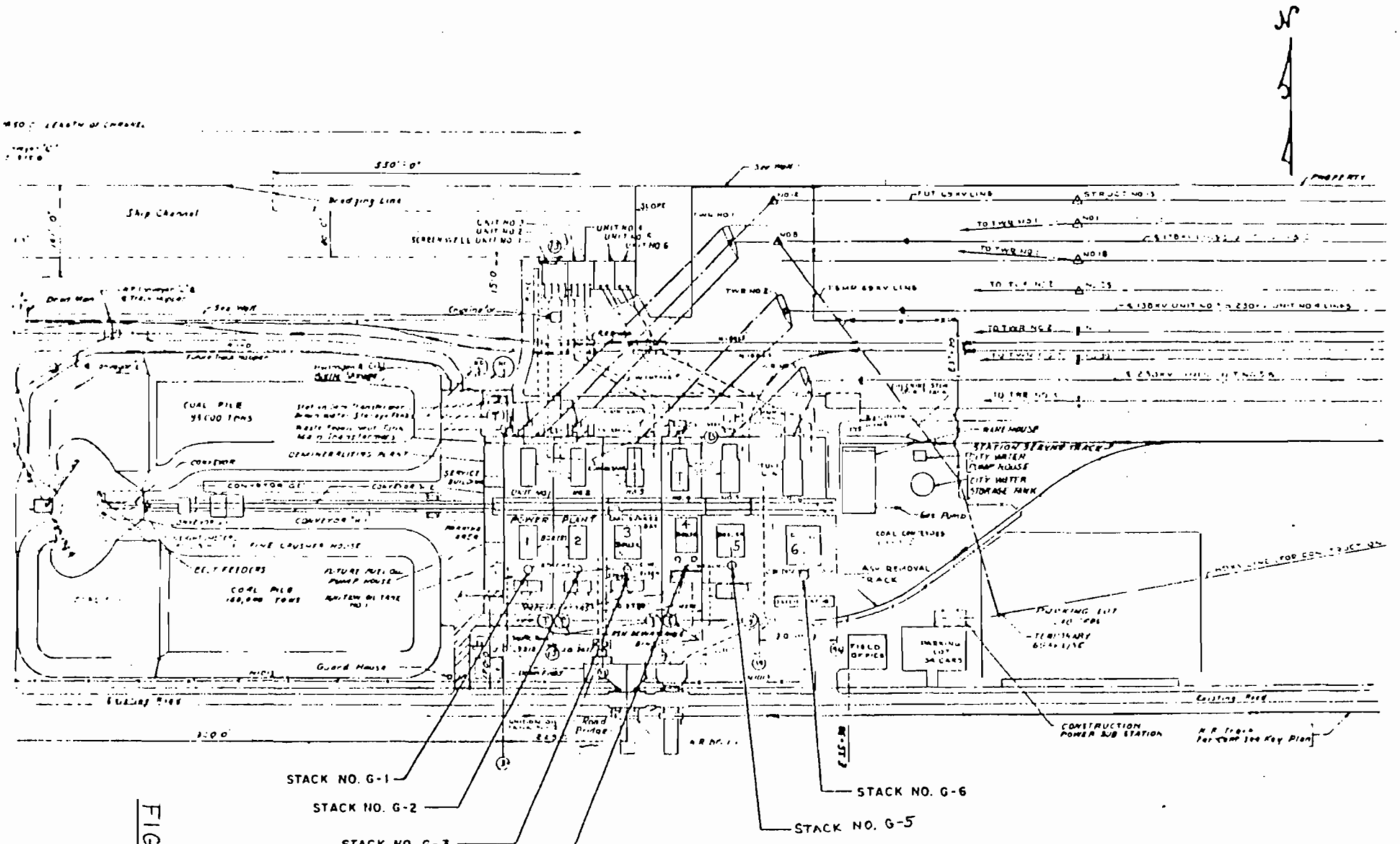

FIGURE 2

PLOT PLAN
GANNON STATION
TAMPA ELECTRIC COMPANY
STONE & WEBSTER ENGINEERING CORPORATION
3 - C2

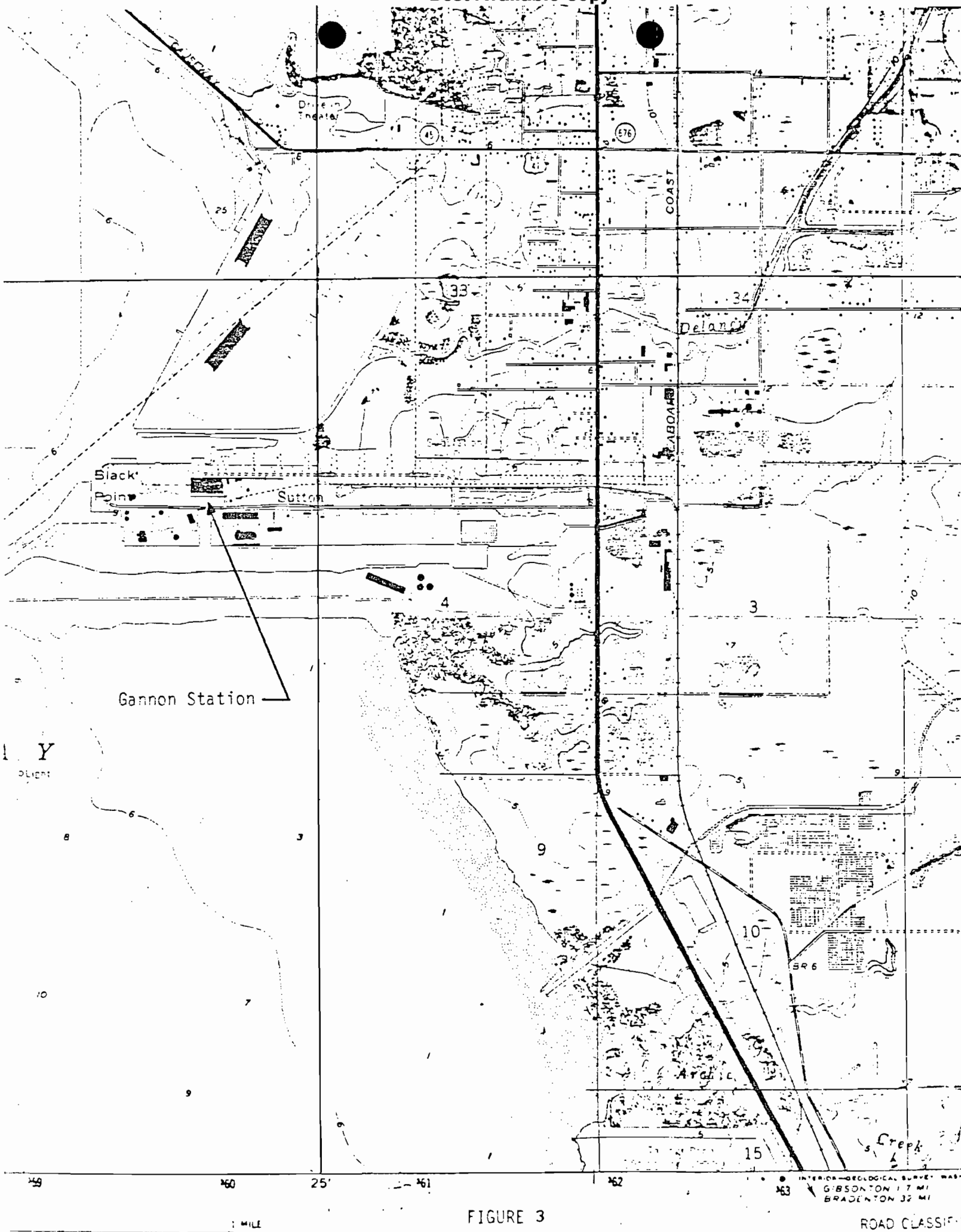

FIGURE 3

ATTACHMENT

GANNON 5

CALCULATIONS

- Maximum/Allowable Emissions

SO_2 $\frac{2.4 \text{ lbs. } SO_2}{\text{MMBTU}} \times \frac{2284 \text{ MMBTU}}{\text{HOUR}} = 5482 \frac{\text{lbs. } SO_2}{\text{HOUR}}$

Particulate $\frac{0.1 \text{ lbs.}}{\text{MMBTU}} \times \frac{2284 \text{ MMBTU}}{\text{HOUR}} = 228.4 \frac{\text{lbs. Part}}{\text{HOUR}}$

- Potential Emissions

SO_2 $\frac{5482 \text{ lbs. } SO_2}{\text{HOUR}} \times \frac{8760 \text{ Hour}}{\text{YEAR}} \times \frac{1 \text{ Ton}}{2000 \text{ lbs.}} = 24{,}009 \frac{\text{Tons } SO_2}{\text{YEAR}}$

Particulate $\frac{228.4 \text{ lbs Part}}{\text{HOUR}} \times \frac{8760 \text{ Hour}}{\text{YEAR}} \times \frac{1 \text{ Ton}}{2000 \text{ lbs.}} \times \frac{1}{1-0.998}$

$= \frac{500{,}196 \text{ Tons Part.}}{\text{YEAR}}$ or $\frac{114{,}200 \text{ lbs.}}{\text{HOUR}}$

- Test Methods

SO_2 - Fuel Analysis

Particulate - EPA Reference Method 17

TECO
TAMPA ELECTRIC COMPANY

POST OFFICE BOX 111 TAMPA, FLORIDA 33601 TELEPHONE (813) 879-4111

September 8, 1981

TO WHOM IT MAY CONCERN:

Please be advised that Jerry L. Williams, Manager of Environmental Planning, is the authorized representative of Tampa Electric Company concerning matters with which this permit application deals.

Very truly yours,

Alex Kaiser
Vice President
Energy Supply

F.J. GANNON STATION - UNIT 5

Operation and Maintenance Plan For The
Processing System and Particulate Control/Collection Systems

Introduction

F.J. Gannon Station is owned and operated by Tampa Electric Company. The plant is located on the eastern shore of Hillsborough Bay at Port Sutton. The plant consists of six steam electric generating units. Units 1 through 4 are oil fired while Units 5 and 6 fire coal.

Unit 5 was placed in service in 1965 with a generator nameplate capacity of 239.4 MW. The boiler was manufactured by the Riley Stoker Corporation and is of the "wet" bottom, opposed firing type. Boiler exhaust gases pass through electrostatic precipitators prior to discharge through a 306' high stack.

Process System Performance Parameters

The Unit 5 boiler burns low sulfur pulverized coal. The design fuel consumption at 100% rating is 93.4 tons per hour. Actual fuel input is monitored on a daily basis.

The maximum design steam capacity of the boiler is 1,660,000 pounds per hour. Steam flow is recorded on a continuous basis.

Particulate Control Equipment Data

Gannon Unit 5 is equipped with two electrostatic precipitators for the control of particulate matter emissions. The precipitators, model numbers G.O. 3129, and G.O. 2791 were manufactured by Research Cottrell Incorporated. Flyash collected by the precipitators is either reinjected into the boiler or pneumatically transported to a storage silo for sale. Important design information and data applicable to the particulate control system are listed below:

	G.O. 3129	G.O. 2791
Design Flow Rate	820,000 cfm	700,000 cfm
Primary Voltage	430-480 volts	430-460 volts
Primary Current	241 amps	152 amps
Secondary Voltage	53.5 volts	53.5 volts
Secondary Current	1500 milliamps	1000 milliamps
Design Efficiency	99.78%	98.5%
Pressure Drop	0.5 inches of H_2O	.5 inches of H_2O
Static Pressure	±15 inches of H_2O	±15 inches of H_2O
Rapper Frequency	1/2 minutes	1/2 minutes
Rapper Duration	Impact	Impact
Temperature	293° F	289° F

Particulate Control Equipment Data Performance Parameters

Precipitator performance parameters are recorded routinely on a daily basis. The information recorded includes primary voltage, primary current, secondary current, and spark rate. This information is logged for each section of the precipitator.

Maintenance and Inspection Schedules

All generating units of the Tampa Electric Company system are regularly scheduled for periodic maintenance. The schedule for planned maintenance outages is affected by system load and forced outage requirements.

The Unit 5 particulate control system receives regular preventive maintenance. The following preventive maintenance procedures are performed on a weekly basis:

- Inspect penthouse pressurizing fan filters. Replace as needed.
- Observe operation of all rappers and vibrators weekly. Check lift of rappers, intensity of vibrators and sequence of operation.

The following preventive maintenance procedures are performed on a daily basis:

- Inspect system controls. Make minor adjustments as needed.
- Check operation of inlet duct distribution plate rappers.

Should these procedures indicate repairs are necessary, maintenance job requests are initiated.

F.J. GANNON STATION - UNIT 5

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D.E.R.

AUG 14 1978

SOUTHWEST DISTRICT
TAMPA

7-16-78

0040
05

RECEIVED
JUN 27 1978
H.C.E.P.C.

8-14-78
AO29-7102

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

Source Type Air Pollution [XX] Incinerator [ ]
Type application: [XX] Operation [ ] Construction
Source Status: [ ] New [XX] Existing [ ] Modification

Source Name: F. J. Gannon Boiler 5 County Hillsborough

Source Location: Street Port Sutton Road City Tampa

UTM: East 360,000m North 3,087,500m

Appl. Name and Title: Tampa Electric Company
Appl. Address: P. O. Box 111, Tampa, Florida 33601

STATEMENTS BY APPLICANT AND ENGINEER

A. **APPLICANT**

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

Signature of the Owner or Authorized Representative

Date: 6/23/78 Telephone No.:

*Attach a letter of authorization. If applicant is a corporation, a Certificate of Good Standing must be submitted with application. This may be obtained, for a $5.00 charge, from the Secretary of State, Bureau of Corporate Records, Tallahassee, Florida 32304.

B. **PROFESSIONAL ENGINEER REGISTERED IN FLORIDA**

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my profesional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature
Name Bernard D. Kitching
(Please Type)
Company Name Tampa Electric Company
Florida Registration Number 6503
(Affix Seal)

Mailing Address P. O. Box 111
Tampa, Florida 33601
Telephone No.: 813/879-4111
Date June 23, 1978

DETAILED DESCRIPTION OF SOURCE

A. Describe the nature and extent of the project. Refer to existing pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance. Attach additional sheet if necessary.

An upgraded electrostatic precipitator was put into service on February 18, 1975. The stack has been extended from 230' to 306' above grade and the exit diameter changed from 14.6' to 10.3'. The unit has also been converted to low sulfur coal.

B. Schedule of Project Covered in this Application (Construction Permit Application Only). N.A.

Start of Construction

Completion of Construction

C. Costs of Construction (Show a breakdown of costs for individual components/units of the project serving pollution control purpose only). Information on actual costs shall be furnished with the application for operation permit.

Stack extension, $2,337,000 for Gannon 1-5, December 1977 estimate

Precipitator upgrade - $4,902,000

D. For this source indicate any previous DER permit: issuance dates, and expiration dates; and orders and notices.

AO29-5630 dated September 13, 1977, expires July 31, 1978

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

AIR POLLUTION SOURCES & CONTROL DEVICES
(other than incinerators)

A. Identification of Air Contaminants

1) [XX] Particulates
   a) [ ] Dust b) [XX] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [XX] Sulfur Compounds
   a) a) [XX] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [XX] Nitrogen Compounds
   a) [XX] NO_x as NO_2 b) [ ] NH_3 c) [ ] Other (Identify)

4) [ ] Flourides 5) [ ] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [ ] Other (Specify) _____

B. Raw Materials and Chemicals Used (Be Specific)

Description	Utilization Rate lbs./hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
N.A.				

C. Process Rate:

1) Total Process input Rate* N.A. Units.
2) Product Weight* electricity (megawatts) Units.
3) Normal Operating Time 24 hrs/day, 7 days/week, if seasonal describe: N.A.
   hrs./day _____ days/wk. _____ wks/yr. _____

D. Airborne Contaminants Discharged:

Name of Contaminant	Actual** Discharge lbs./hr.	Actual** Discharge T/yr.	Discharge Criteria Rate*	Allowable Discharge Lbs./hr.	Relate to Flow Diagram
Sulfur dioxide	4600	11372	2.4 lbs/MMBTU	5904	(3)
Particulates	49	122	0.1 lbs/MMBTU	246	(3)

NOTE: (1) Calculated from source test data and fuel analysis data of February 15, 1978

*Refer to Chapter 17-2.04(2), Florida Administrative Code.

(Discharge Criteria: Rate= #/ton P_2O_5, #/M BTU/hr., etc.)

**Estimate only if this is an application to construct.

D. Airborne Contaminants Discharged. (Cont'd.)

Name of Contaminant	Hourly Emission (lbs/hr) lbs/MMBTU	Daily Emission (lb./day)	Yearly Emission (T/yr.)	Basis for Emission Estimate (Test Data, Material Balance)
Sulfur dioxide	1.87	See previous page		Test data from February 15, 1978 stack test
Particulate	0.02			Test data from February 15, 1978 stack test

E. Control Devices:

Name and Type (Model and Serial No.)	Contaminant	Efficiency*	Conditions of Operations	Basis for Efficiency Operational Data, Test, Design, Data)
Electrostatic precipitator	Particulate	99.78	Max. load	Design

*See required supplement.
(Include any test data and/or design data for efficiency substantiation)

F. Fuels

Type (Be Specific, includes %S, etc.)	Daily Consumption *		Maximum Heat Input MBTU/hr.
	Avg./hr. (1)	Max./hr.	
Coal (1.3%S annual average)	137,300	186,800	2284

NOTE: (1) from 1977 HCEPC Emission Inventory (68.65 tons X 2000 lbs/ton)

* Units: Natural Gas MCF/hr.; Fuel Oils, Coal–lbs./hr.

Fuel Analysis: Sample taken during February 15, 1978 stack test

Percent Sulfur 1.19 Percent Ash 9.22

Density N/A lb./gal.

Heat Capacity 12,119 BTU/lb. BTU/gal.

Other Fuel Contaminants

G. Describe briefly, without revealing trade secrets, the processes/operations generating the airborne emissions identified in this application.

Coal is burned to generate steam which is used to produce electricity.

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

Collected fly ash is penumatically transferred to a storage silo from where it is sold and loaded onto trucks.

I. Emission Stack Geometry and Flow Characteristics, (Provide Date for each Stack). (1)

Stack Height 306' ft, Stack Diameter 14.6 10.3 ft.

Gas Flow Rate 681,000 max. 497,000 avg. ACFM, Gas Exit Temperature 288 °F

J. Required Supplements:

1. Total process input rate and product weight – show deviation. Maximum heat input to boiler is 2284 X 10^6 BTU/hr. Operating range is from approximately 35% to 100% load.
2. Efficiency Estimation.
   N.A.
3. An 8½" x 11" flow diagram, which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate whether raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particulates are evolved and where finished products are obtained.
   See Figure 3-C1
4. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
   See Figure 3-C2
5. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways.
   See Figure 3-C3
6. If applicable, provide a brief description of the control device or treatment system serving the discharge point for airborne contaminants identified in this application. Include details of the manufacturer, model, size, type and capacity for control/treatment device and the features of the discharge point (height above ground, diameter, period(s) of discharge and discharge temperature). Research Cottrell electrostatic precipitator. See Figure 5-C1 for typical design.
7. Plans for storm water control during and after construction.
   N.A.

Note: (1) 1977 HCEPC Emission Inventory

INCINERATOR INFORMATION

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patho-logical)	Type V (Liq. & Gas By-prod.)	Type VI (Solid By-prod.)
Lbs./Hr. incinerated							

Description of Waste _____

Total Weight Incinerated lbs./hr. _____ Design Capacity lbs./hr. _____

Approximate Number of Hours of Operation per Day _____, days/week _____

Manufacturer _____ Model No.: _____

Date Constructed: _____

	Volume (ft. *)³	Heat Release (BTU/hr.)	Fuel		Temp. (° F)
			Type	BTU/hr.	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp.: _____ °F

Type of Pollution Control Device [ ] Cyclone [ ] Wet scrubber [ ] Afterburner
[ ] Other (Specify): _____

Brief Description of Operating Characteristics of Control Device: _____

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

GANNON 5 OPERATING PERMIT

REAPPLICATION

ACTUAL DISCHARGE

SO_2 1.87 lbs/MMBTU X 2460 $\frac{\text{MMBTU}}{\text{Hr.}}$ = 4,600 $\frac{\text{lbs/SO}_2}{\text{Hr.}}$

4,600 lbs SO_2/hr. X 1 ton/2000 lbs. X 4944 hrs/year = 11,372 $\frac{\text{tons SO}_2}{\text{year}}$

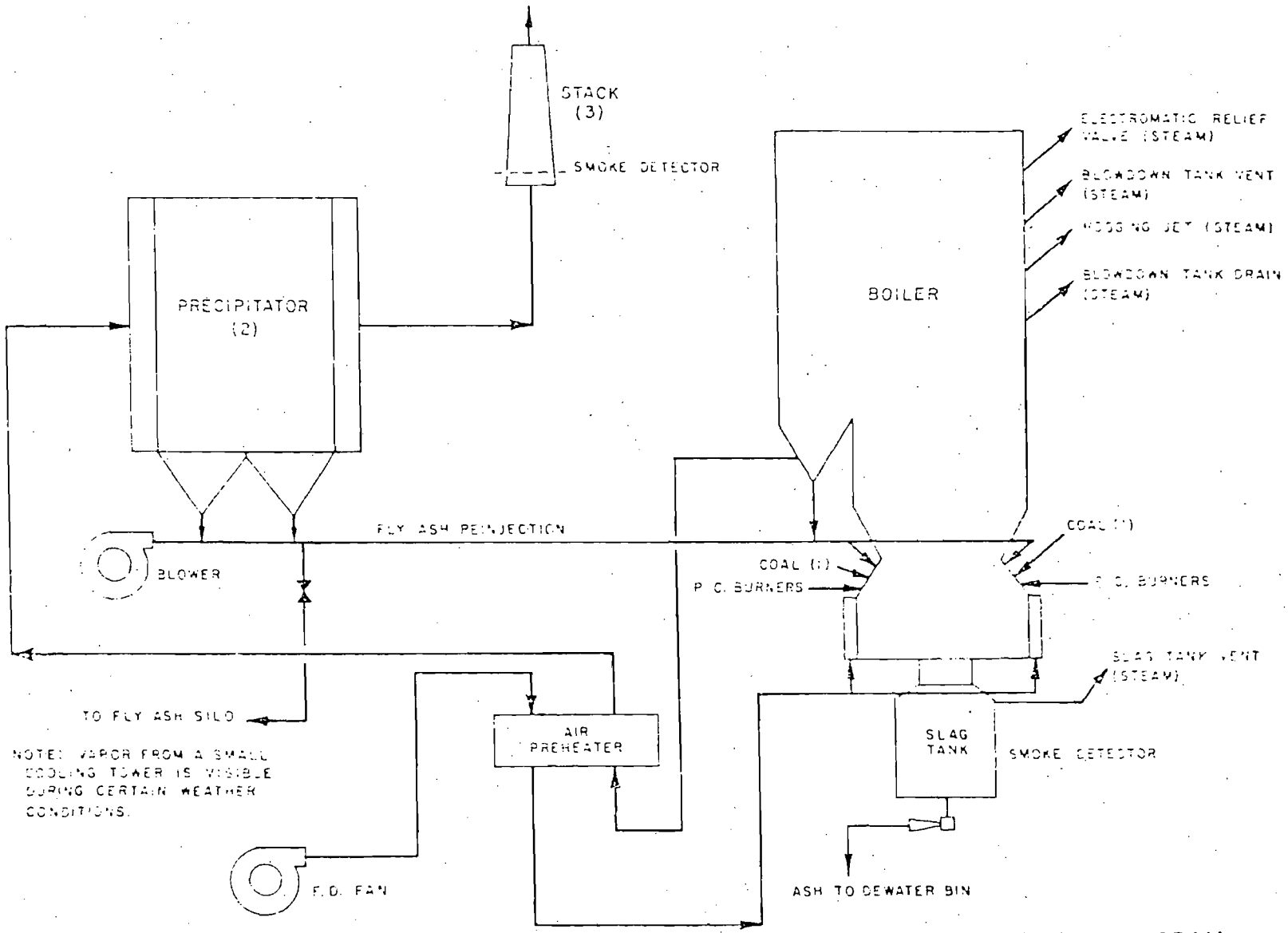
Part. 0.02 lbs/MMBTU X 2460 $\frac{\text{MMBTU}}{\text{Hr.}}$ = 49.2 $\frac{\text{lbs. part.}}{\text{Hr.}}$

49.2 lbs. part/hr X 1 ton/2000 lbs. X 4944 hrs/year = 121.6 $\frac{\text{tons part}}{\text{Year}}$

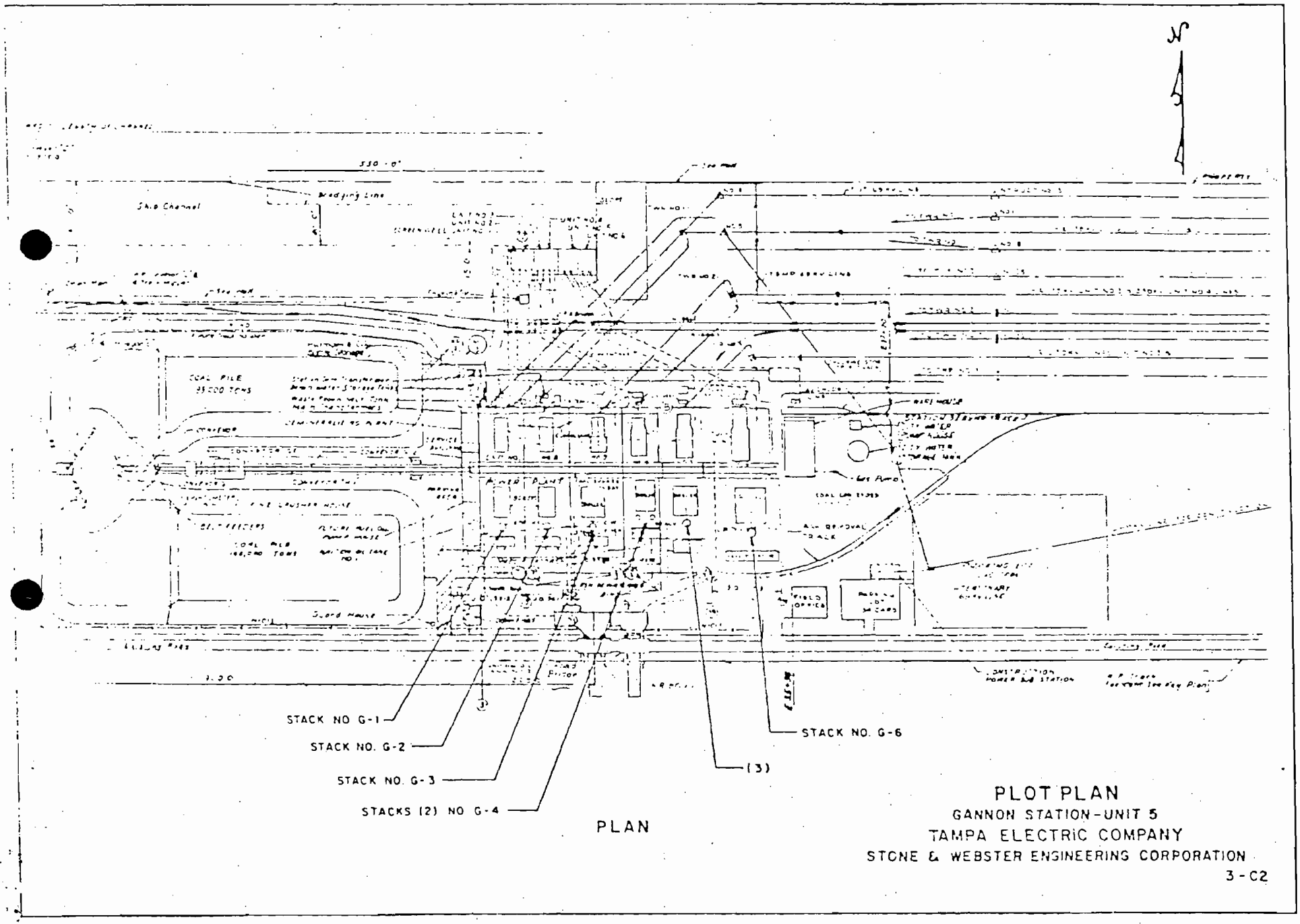
ALLOWABLE DISCHARGE

SO_2 2.4 lbs. SO_2/MMBTU X 2460 $\frac{\text{MMBTU}}{\text{Hr.}}$ = 5904 $\frac{\text{lbs. SO}_2}{\text{Hr.}}$

Part. 0.1 lbs part/MMBTU X 2460 $\frac{\text{MMBTU}}{\text{Hr.}}$ = 246 $\frac{\text{lbs part}}{\text{Hr.}}$



FLOW DIAGRAM
GANNON STATION-UNIT 5
TAMPA ELECTRIC COMPANY



PLAN

PLOT PLAN

GANNON STATION - UNIT 5

TAMPA ELECTRIC COMPANY

STONE & WEBSTER ENGINEERING CORPORATION

3-C2

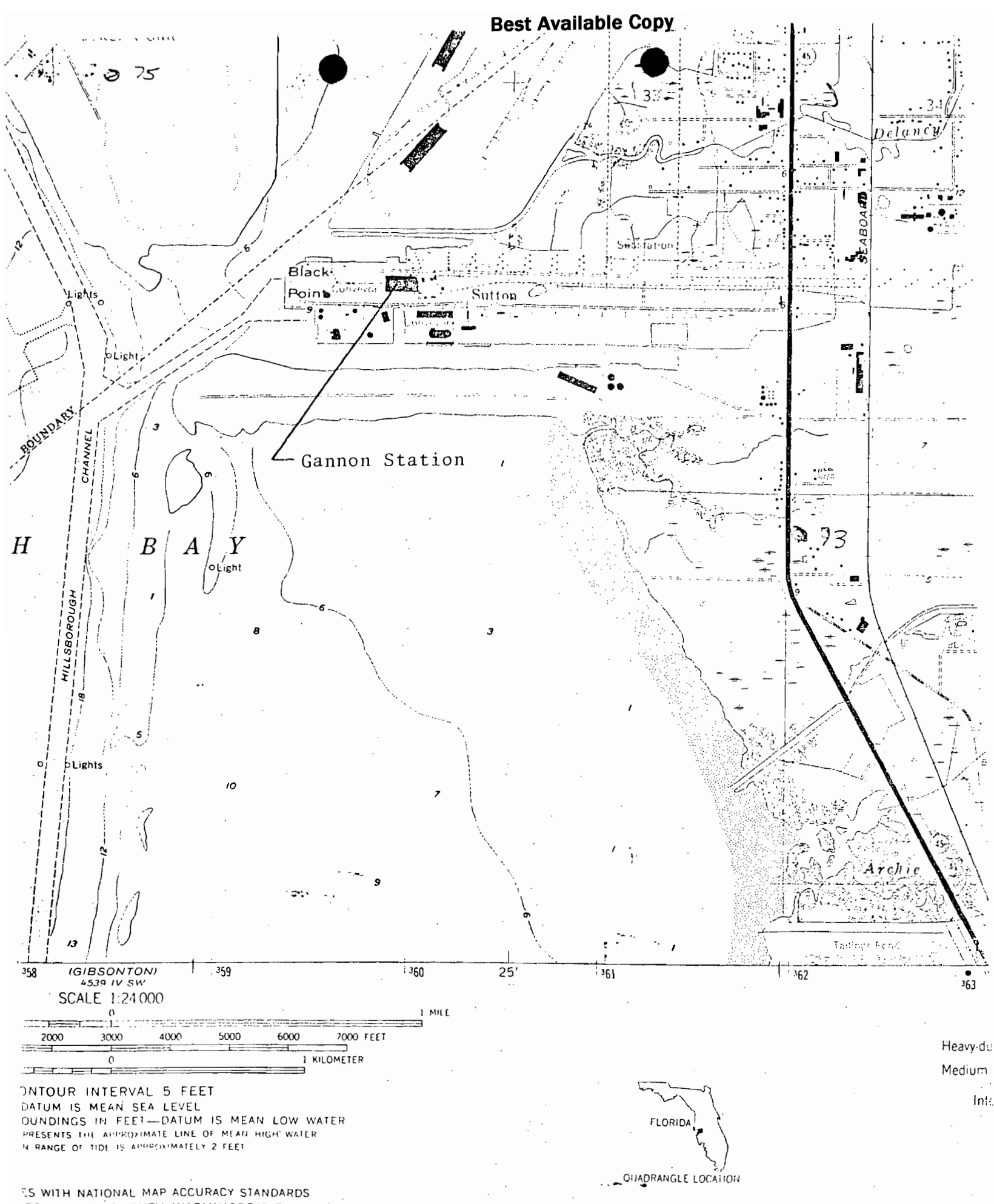
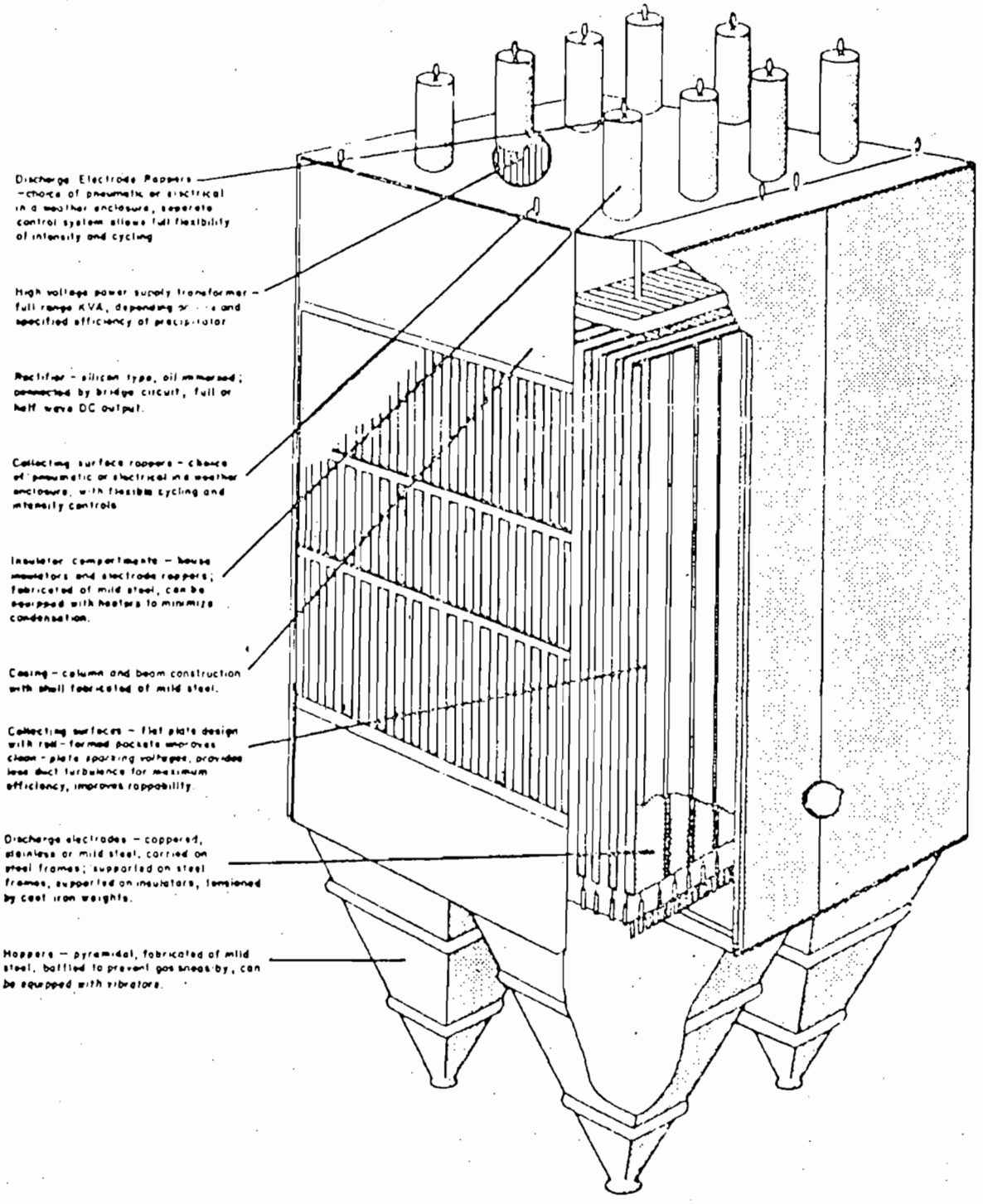


Figure 3



Discharge Electrode Rappers – choice of pneumatic or electrical in a weather enclosure, separate control system allows full flexibility of intensity and cycling

High voltage power supply transformer – full range KVA, depending on [illegible] and specified efficiency of precipitator

Rectifier – silicon type, oil immersed; connected by bridge circuit, full or half wave DC output.

Collecting surface rappers – choice of pneumatic or electrical in a weather enclosure, with flexible cycling and intensity controls

Insulator compartments – house insulators and electrode rappers; fabricated of mild steel, can be equipped with heaters to minimize condensation.

Casing – column and beam construction with shell fabricated of mild steel.

Collecting surfaces – flat plate design with roll-formed pockets improves clean-plate sparking voltages, provides less duct turbulence for maximum efficiency, improves rappability.

Discharge electrodes – coppered, stainless or mild steel, carried on steel frames; supported on steel frames, supported on insulators, tensioned by cast iron weights.

Hoppers – pyramidal, fabricated of mild steel, baffled to prevent gas sneak-by, can be equipped with vibrators.

ELECTROSTATIC PRECIPITATOR

GANNON STATION-UNIT 5

TAMPA ELECTRIC COMPANY

STONE & WEBSTER ENGINEERING CORPORATION

5-C1

BEST AVAILABLE COPY

APPROVED JUL 20 1977

0040
05

RECEIVED JUL 1 1977 H.C.E.P.C.

D.E.R. AUG 15 197

SOUTH WEST DISTR ST. PETERSBUR

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

8-15-77 dm
A029-5630

Source Type: Air Pollution [XX] Incinerator [ ]
Type application: [XX] Operation [ ] Construction
Source Status: [ ] New [XX] Existing [ ] Modification

Source Name: F. J. Gannon Station, No. 5 Boiler County: Hillsborough

Source Location: Street: Port Sutton Road City: Tampa

UTM: East: 360,000m North: 3,087,500m

Appl. Name and Title: Tampa Electric Company
Appl. Address: P. O. Box 111, Tampa, Florida 33601

STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

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

Signature of the Owner or Authorized Representative

Date: 7/1/77 Telephone No.: 813/879-4111

*Attach a letter of authorization. If applicant is a corporation, a Certificate of Good Standing must be submitted with application. This may be obtained, for a $5.00 charge, from the Secretary of State, Bureau of Corporate Records, Tallahassee, Florida 32304.

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature: W. J. Johnson
Name: W. J. Johnson (Please Type)
Company Name: Tampa Electric Company
Florida Registration Number: 12442
(Affix Seal)

STATE OF FLORIDA REGISTERED ENGINEER

Mailing Address: P. O. Box 111, Tampa, Fla. 33601
Telephone No.: 813/879-4111
Date: June 30 1977

A. Describe the nature and extent of the project. Refer to existing pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance. Attach additional sheet if necessary.

The upgraded electrostatic precipitator was tied-in on February 18, 1975, the stack has been extended from 230' above grade to 306' above grade and the exit diameter changed from 14.6' to 10.3'. The unit was also converted to low sulfur coal.

B. Schedule of Project Covered in this Application (Construction Permit Application Only). N/A

Start of Construction

Completion of Construction

C. Costs of Construction (Show a breakdown of costs for individual components/units of the project serving pollution control purpose only). Information on actual costs shall be furnished with the application for operation permit.

Stack extension - $2,284,000 for Gannon 1-5, May 1977 estimate
Precipitator upgrade - $4,902,000

D. For this source indicate any previous DER permit: issuance dates, and expiration dates; and orders and notices.

AO29-2486 dated October 14, 1976, expires July 1, 1977

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

A. Identification of Air Contaminants

1) [XX] Particulates
a) [ ] Dust b) [XX] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [XX] Sulfur Compounds
a) a) [XX] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [XX] Nitrogen Compounds
a) [XX] NO_x as NO_2 b) [ ] NH_3 c) [ ] Other (Identify)

4) [ ] Flourides 5) [ ] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [ ] Other (Specify) _____

B. Raw Materials and Chemicals Used (Be Specific)

Description	Utilization Rate lbs./hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
N/A				

C. Process Rate:

1) Total Process input Rate* N/A Units.

2) Product XXXXXX electricity (megawatts) Units.

3) Normal Operating Time 24 hrs/day, 7 days/week, if seasonal describe: N/A

hrs./day days/wk. wks/yr.

D. Airborne Contaminants Discharged

Name of Contaminant	Actual** Discharge lbs./hr.	Actual** Discharge T/yr.	Discharge Criteria Rate*	Allowable Discharge Lbs./hr.	Relate to Flow Diagram
Sulfur Dioxide	3760.6 (1)	5904.6 (2)	2.4 #/MMBTU	5592.0	
Particulates	209.7	329.2	0.1 #/MMBTU	233.0	

Notes: (1) Test data from May 18, 1977 test.
(2) Calculated from May 18, 1977 test emission rates and 1976 annual fuel consumption

*Refer to Chapter 17-2.04(2), Florida Administrative Code.
(Discharge Criteria: Rate= # ton P_2O_5, #/M BTU/hr., etc.)

**Estimate only if this is an application to construct.

D. Airborne Contaminants Discharged. (Cont'd.)

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Name of Contaminant	Hourly Emission XXXXXX lbs/MMBTU	Daily Emission (lb./day)	Yearly Emission (T/yr.)	Basis for Emission Estimate (Test Data, Material Balance)
Sulfur Dioxide	1.614	See previous	page	Fuel analysis
Particulate	0.09	See previous	page	Test data (May 18, 1977)

E. Control Devices:

Name and Type (Model and Serial No.)	Contaminant	Efficiency*	Conditions of Operations	Basis for Efficiency Operational Data, Test, Design, Data)
Electrostatic Precipitator	Particulate	99.78	Max. Load	Design

*See required supplement.
(Include any test data and/or design data for efficiency substantiation)

F. Fuels

Type (Be Specific, includes %S, etc.)	Daily Consumption *		Maximum Heat Input MBTU/hr.
	Avg./hr.[1]	Max./hr.	
Coal (1.3%S) annual average	142,400 #/hr.	186,800 #/hr.	2691
Note: (1) 1976 data from HCEPC emission inventory			

* Units: Natural Gas MCF/hr.; Fuel Oils, Coal - lbs./hr.

Fuel Analysis:

Percent Sulfur 1.04 Percent Ash 9.27

Density N/A lb./gal.

Heat Capacity 12,245 BTU/lb. N/A BTU/gal.

Other Fuel Contaminants

G. Describe briefly, without revealing trade secrets, the processes/operations generating airborne emissions identified in this application.

Coal is burned to generate steam which is used to generate electricity.

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

Collected fly ash is pneumatically transferred to a storage silo where it is sold and loaded into trucks.

I. Emission Stack Geometry and Flow Characteristics, (Provide Date for each Stack).

Stack Height 306' ft, Stack Diameter 10.3 ft.

Gas Flow Rate 515,000 (avg.)[1] / 681,000 (max.) ACFM, Gas Exit Temperature 288 °F

J. Required Supplements:

1. Total process input rate and product weight -- show deviation. 2691 X 10^6 BTU/hr. heat input. Operating range is from approximately 35% load to 100% load.
2. Efficiency Estimation. N/A
3. An 8½" x 11" flow diagram, which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate whether raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particulates are evolved and where finished products are obtained.
   See attached Flow Diagram 3-C1
4. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
   See attached Plot Plan 3-C2
5. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways.
   See attached Location Map 3-C3
6. If applicable, provide a brief description of the control device or treatment system serving the discharge point for airborne contaminants identified in this application. Include details of the manufacturer, model, size, type and capacity for control/treatment device and the features of the discharge point (height above ground, diameter, period(s) of discharge and discharge temperature). Research Cottrell electrostatic precipitator, See Item I above for stack discharge characteristics. (See Sheet 5-C1 for typical design)
7. Plans for storm water control during and after construction.
   N.A.

Note: (1) 1976 HCEPC Emission Inventory

INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patho-logical)	Type V (Liq. & Gas By-prod.)	Type VI (Solid By-prod.)
Lbs./Hr. *incinerated*							

Description of Waste: _____

Total Weight Incinerated lbs./hr. _____ Design Capacity lbs./hr. _____

Approximate Number of Hours of Operation per Day _____, days/week _____

Manufacturer _____ Model No.: _____

Date Constructed: _____

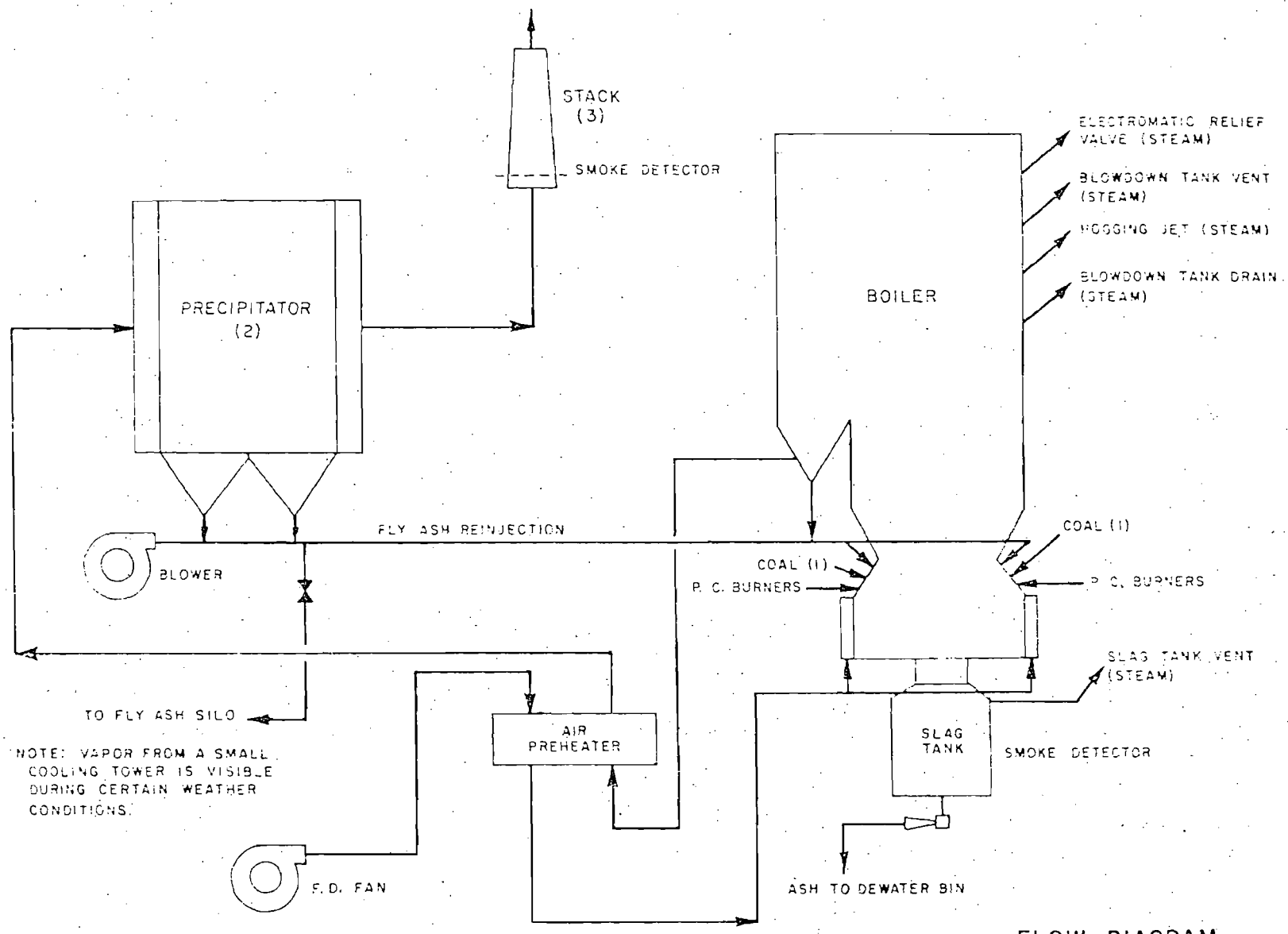
	Volume (ft. ^{3})	Heat Release (BTU/hr.)	Fuel		Temp. (^{o}F)
			Type	BTU/hr.	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp.: _____ ^{o}F

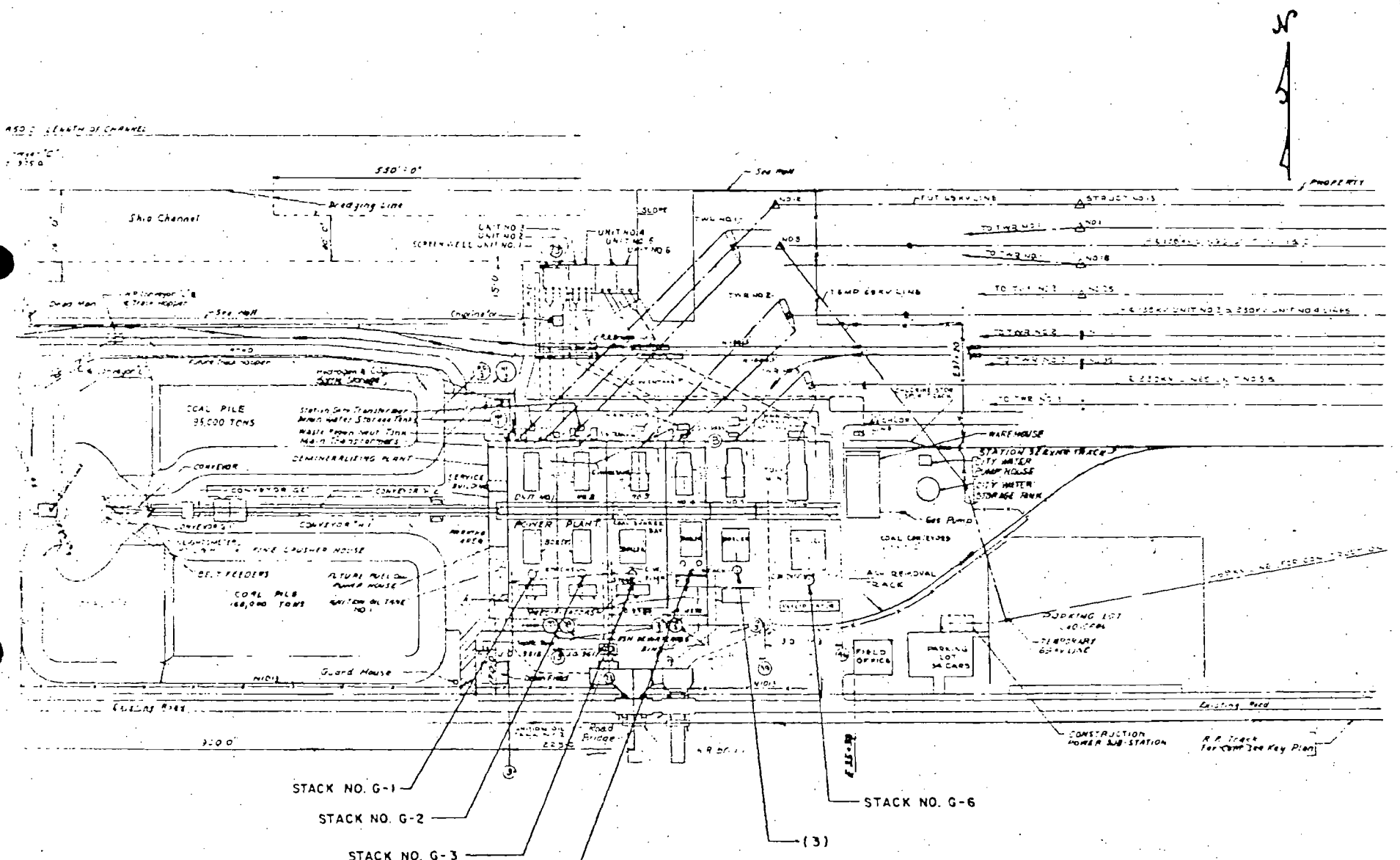
Type of Pollution Control Device [ ] Cyclone [ ] Wet scrubber [ ] Afterburner
[ ] Other (Specify): _____

Brief Description of Operating Characteristics of Control Device: _____

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



FLOW DIAGRAM
GANNON STATION-UNIT 5
TAMPA ELECTRIC COMPANY



PLAN

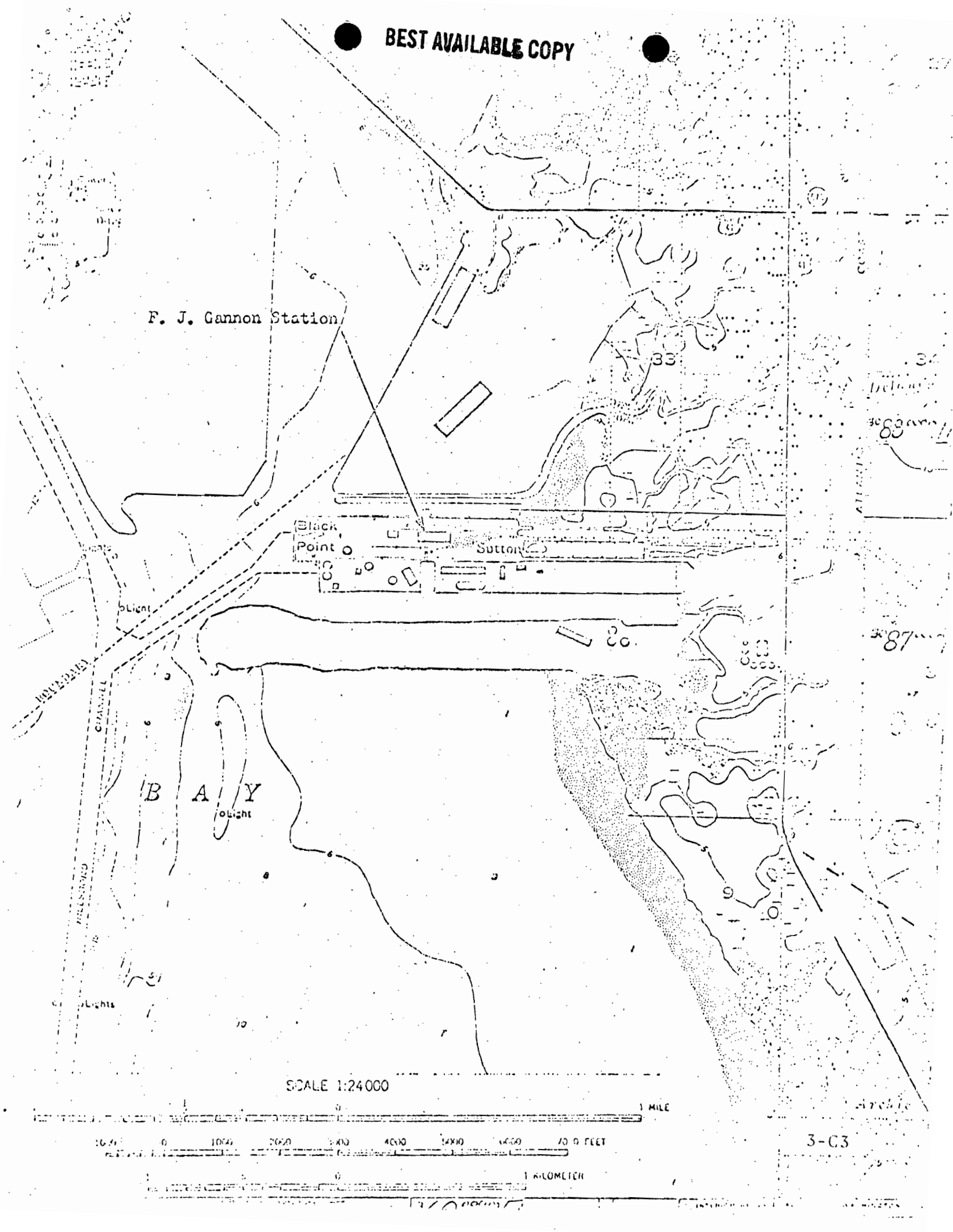
PLOT PLAN

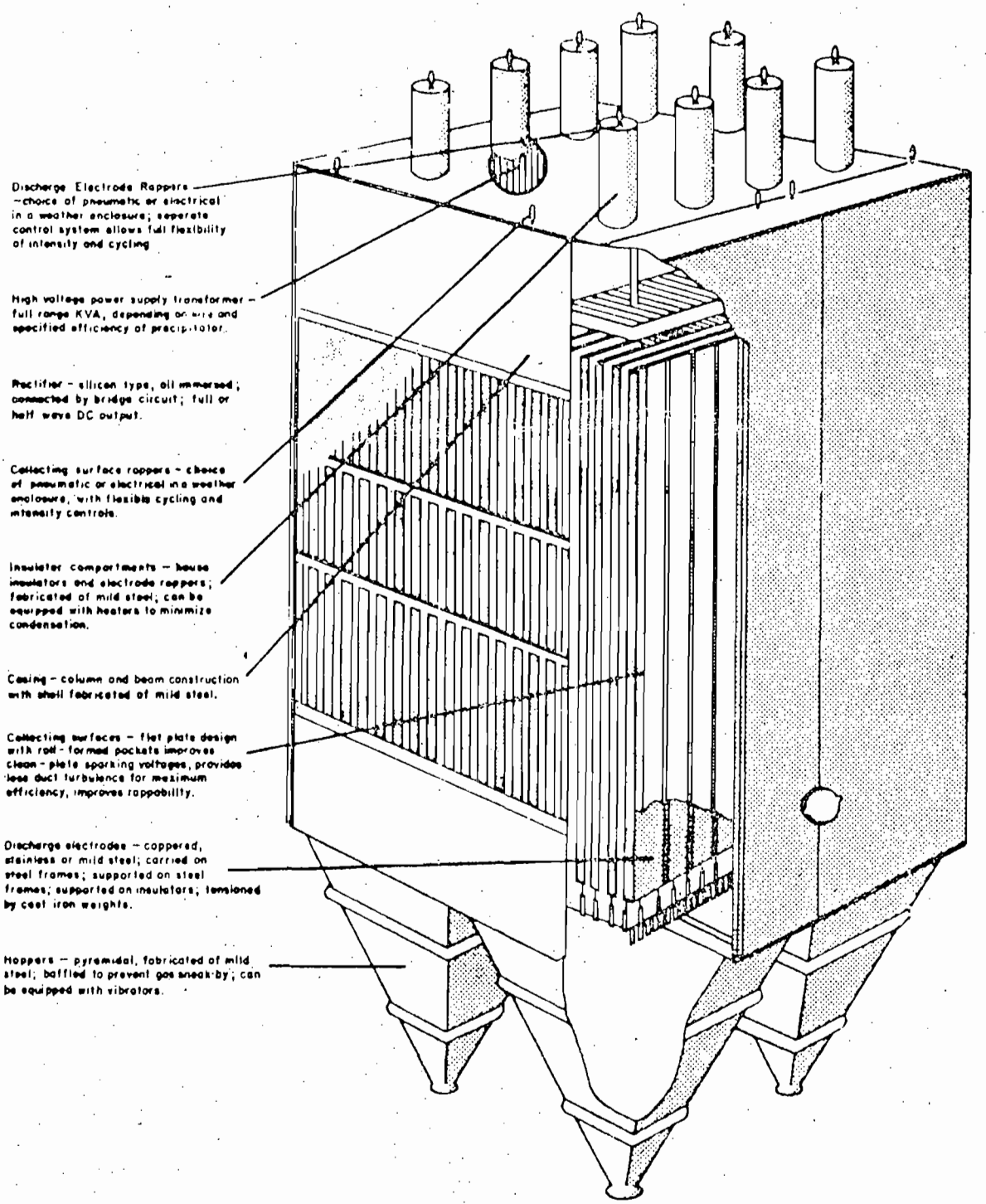
GANNON STATION - UNIT 5

TAMPA ELECTRIC COMPANY

STONE & WEBSTER ENGINEERING CORPORATION

3-C2





Discharge Electrode Rappers – choice of pneumatic or electrical in a weather enclosure; seperate control system allows full flexibility of intensity and cycling

High voltage power supply transformer – full range KVA, depending on size and specified efficiency of precipitator.

Rectifier – silicon type, oil immersed; connected by bridge circuit; full or half wave DC output.

Collecting surface rappers – choice of pneumatic or electrical in a weather enclosure, with flexible cycling and intensity controls.

Insulator compartments – house insulators and electrode rappers; fabricated of mild steel; can be equipped with heaters to minimize condensation.

Casing – column and beam construction with shell fabricated of mild steel.

Collecting surfaces – flat plate design with roll-formed pockets improves clean-plate sparking voltages, provides less duct turbulence for maximum efficiency, improves rappability.

Discharge electrodes – coppered, stainless or mild steel; carried on steel frames; supported on steel frames; supported on insulators; tensioned by cast iron weights.

Hoppers – pyramidal, fabricated of mild steel; baffled to prevent gas sneak-by; can be equipped with vibrators.

ELECTROSTATIC PRECIPITATOR

GANNON STATION-UNIT 5

TAMPA ELECTRIC COMPANY

STONE & WEBSTER ENGINEERING CORPORATION

5-C1

AIR POLLUTION SOURCES & CONTROL DEVICES
(other than incinerators)

A. Identification of Air Contaminants

1) [XX] Particulates
a) [ ] Dust b) [XX] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [XX] Sulfur Compounds
a) a) [XX] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [XX] Nitrogen Compounds
a) [XX] NO_x as NO_2 b) [ ] NH_3 c) [ ] Other (Identify)

4) [ ] Flourides 5) [ ] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [ ] Other (Specify) _____

B. Raw Materials and Chemicals Used (Be Specific)

Description	Utilization Rate lbs./hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
N/A				

C. Process Rate:

1) Total Process input Rate* N/A Units.

2) Product ~~XXXXX~~* electricity (megawatts) Units.

3) Normal Operating Time 24 hrs/day, 7 days/week, if seasonal describe: N/A

hrs./day _____ days/wk. _____ wks/yr. _____

D. Airborne Contaminants Discharged

Name of Contaminant	Actual** Discharge lbs./hr.[1]	Actual** Discharge T/yr.[2]	Discharge Criteria Rate*[3]	Allowable Discharge Lbs./hr.	Relate to Flow Diagram
Sulfur Dioxide	3760.6	10,378.1	2.4#/MMBTU	5592.0	
Particulates	209.7	578.7	0.1#/MMBTU	233.0	

NOTES: (1) Test data from May 18, 1977 test
(2) Calculated from May 18, 1977 test emission rates and 1976 annual fuel consumption
(3) Revised 8-26-77

*Refer to Chapter 17-2.04(2), Florida Administrative Code.

(Discharge Criteria: Rate= #/ton P_2O_5, #/M BTU/hr., etc.)

**Estimate only if this is an application to construct.

Revised Calculations for Dannon 5 Re-application

from 1976 Gen - Dist Report

$$\frac{1,331,610,000 \text{ KWH}}{2,448,846,000 \text{ KWH}} \times 989,703 \text{ tons coal} \times 23,896,000 \frac{\text{BTU}}{\text{ton}} =$$

$$1.28601 \times 10^{13} \text{ BTU/year}$$

Particulates

$$2.33 \times 10^{9} \frac{\text{BTU}}{\text{hr}} \times \frac{0.09 \text{ lbs part}}{10^{6} \text{ BTU}} = 209.7 \text{ lbs/hr} \quad \text{Actual}$$

$$2.33 \times 10^{9} \frac{\text{BTU}}{\text{hr}} \times \frac{0.10 \text{ lbs part}}{10^{6} \text{ BTU}} = 233.0 \text{ lbs/hr} \quad \text{Allowable}$$

$$1.28601 \times 10^{13} \frac{\text{BTU}}{\text{year}} \times \frac{0.09 \text{ lbs part}}{10^{6} \text{ BTU}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = 578.7 \frac{\text{tons}}{\text{year}}$$

SO_2 (from fuel analysis taken during test)

$$2.33 \times 10^{9} \frac{\text{BTU}}{\text{hr}} \times \frac{1.614 \text{ lbs } SO_2}{10^{6} \text{ BTU}} = 3760.6 \frac{\text{lbs}}{\text{hr}} \quad \text{Actual}$$

$$2.33 \times 10^{9} \frac{\text{BTU}}{\text{hr}} \times \frac{2.4 \text{ lbs } SO_2}{10^{6} \text{ BTU}} = 5592.0 \frac{\text{lbs}}{\text{hr}} \quad \text{Allowable}$$

$$1.28601 \times 10^{13} \frac{\text{BTU}}{\text{year}} \times \frac{1.614 \text{ lbs } SO_2}{10^{6} \text{ BTU}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = 10,378.1 \frac{\text{tons}}{\text{year}}$$

August 26, 1977

MLL

AIR POLLUTION SOURCES & CONTROL DEVICES
(other than incinerators)

A. Identification of Air Contaminants

1) |XX| Particulates
a) | | Dust b) |XX| Fly Ash c) | | Smoke d) | | Other (Identify)

2) |XX| Sulfur Compounds
a) a) |XX| SO_x as SO_2 b) | | Reduced Sulfur as H_2S c) | | Other (Identify)

3) |XX| Nitrogen Compounds
a) |XX| NO_x as NO_2 b) | | NH_3 c) | | Other (Identify)

4) | | Flourides 5) | | Acid Mist 6) | | Odor

7) | | Hydrocarbons 8) | | Volatile Organic Compounds

9) | | Other (Specify) _____

B. Raw Materials and Chemicals Used (Be Specific)

Description	Utilization Rate lbs./hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
N/A				

C. Process Rate

1) Total Process input Rate* N/A Units.

2) Product XXXXX electricity (megawatts) Units.

3) Normal Operating Time 24 hrs/day, 7 days/week ; if seasonal describe: N/A

hrs./day days/wk: wks/yr:

D. Airborne Contaminants Discharged

Name of Contaminant	Actual** Discharge lbs./hr.	Actual** Discharge T/yr. 1, 2, 3	Discharge Criteria Rate*	Allowable Discharge Lbs./hr.	Relate to Flow Diagram
Sulfur Dioxide	3760.6	10,378.1	2.4#/MMBTU	5592.0	
Particulates	209.7	578.7	0.1#/MMBTU	233.0	

NOTES: (1) Test data from May 18, 1977 test
(2) Calculated from May 18, 1977 test emission rates and 1976 annual fuel consumption
(3) Revised 8-26-77

*Refer to Chapter 17-2.04(2), Florida Administrative Code.
(Discharge Criteria Rate= # /ton P_2O_5, #/M BTU/hr., etc.)

**Estimate only if this is an application to construct.

APPROVED
SEP 29 1976
SW 10/5/76

A029-2486
0040
05

D.E.R.
OCT 4 1976
SOUTH WEST DISTRICT
ST. PETERSBURG

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

Source Type: Air Pollution [XX] Incinerator [ ]
Type application: [XX] Operation [ ] Construction
Source Status: [ ] New [XX] Existing [ ] Modification

Source Name: F.J. Gannon Station, No. 5 boiler County Hillsborough

Source Location: Street Port Sutton Road City Tampa

UTM: East 360,000 m North 3,087,500 m

Appl. Name and Title: Tampa Electric Company
Appl. Address: P.O. Box 111, Tampa, Florida 33601

STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

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

Signature of the Owner or Authorized Representative

Date: 7/14/76 Telephone No.: 813/876-4111

*Attach a letter of authorization. If applicant is a corporation, a Certificate of Good Standing must be submitted with application. This may be obtained, for a $5.00 charge, from the Secretary of State, Bureau of Corporate Records, Tallahassee, Florida 32304.

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my profesional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature: Mailing Address P.O. Box 111
Name B.D. Kitchens Tampa, Fla. 33601
(Please Type)
Company Name Tampa Electric Company Telephone No.: 813/876-4111
Florida Registration Number 6503 Date 5-14-76
(Affix Seal)

REGISTERED ENGINEER NO. 6503 STATE OF FLORIDA

DETAILED DESCRIPTION OF SOURCE

A. Describe the nature and extent of the project. Refer to existing pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance. Attach additional sheet if necessary.

The upgraded electrostatic precipitator was tied-in on February 18, 1975, the stack has been extended from 230' above grade to 306' above grade and the exit diameter changed from 14.6' to 10.3'. The unit was also converted to low sulfur coal on July 1, 1975.

B. Schedule of Project Covered in this Application (Construction Permit Application Only). N/A

Start of Construction _____

Completion of Construction _____

C. Costs of Construction (Show a breakdown of costs for individual components/units of the project serving pollution control purpose only). Information on actual costs shall be furnished with the application for operation permit.

Stack extension - $2,300,000 - April, 1976 estimate
Gannon Units 1-5
Precipitator Upgrade - $4,948,000 - April, 1976 estimate

D. For this source indicate any previous DER permit: issuance dates, and expiration dates; and orders and notices.

AO29-2191 - dated May 25, 1973, expires July 1, 1975

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

AIR POLLUTION SOURCES & CONTROL DEVICES
(other than incinerators)

A. Identification of Air Contaminants

1) [XX] Particulates
   a) [ ] Dust b) [XX] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [XX] Sulfur Compounds
   a) a) [XX] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [XX] Nitrogen Compounds
   a) [XX] NO_x as NO_2 b) [ ] NH_3 c) [ ] Other (Identify)

4) [ ] Flourides 5) [ ] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [ ] Other (Specify) _____

B. Raw Materials and Chemicals Used (Be Specific)

Description	Utilization Rate lbs./hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
N/A				

C. Process Rate:

1) Total Process input Rate* N/A Units.
2) Product Weight* Electricity (megawatts) Units.
3) Normal Operating Time 24 hrs/day, 7 days/wk if seasonal describe: N/A
   hrs./day _____ days/wk. _____ wks/yr. _____

D. Airborne Contaminants Discharged:

Name of Contaminant	Actual** Discharge lbs./hr.[1]	Actual** Discharge T/yr.[2]	Discharge Criteria Rate*	Allowable Discharge Lbs./hr.	Relate to Flow Diagram
Sulfur Dioxide	4575	8592	1bs/MM BTU	2.4	(3)
Particulates	4.96	9.3	1bs/MM BTU	0.1	(3)

*Refer to Chapter 17-2.04(2), Florida Administrative Code.
(Discharge Criteria: Rate= #/ton P_2O_5, #/M BTU/hr., etc.)
**Estimate only if this is an application to construct.

NOTE: (1) Test data from March 30-31,1976 test (200MW)
(2) Calculated using emission rates from March 30-31,1976 test and 1975 annual fuel consumption

D. Airborne Contaminants Discharged. (Cont'd.)

Name of Contaminant	Hourly Emission XXXXX #/10^6 BTU	Daily Emission (lb./day)	Yearly Emission (T/yr.)	Basis for Emission Estimate (Test Data, Material Balance)
Sulfur Dioxide	2.31	See previous page		Fuel Analysis
Particulates	0.0025	See previous page		Test data (Mar.30-31,1976)

E. Control Devices:

Name and Type (Model and Serial No.)	Contaminant	Efficiency*	Conditions of Operations	Basis for Efficiency Operational Data, Test, Design, Data)
Electrostatic Precipitator	Particulate	99.78	Maximum load	Design

*See required supplement.
(Include any test data and/or design data for efficiency substantiation)

F. Fuels

Type (Be Specific, includes %S, etc.)	Daily Consumption * Avg./hr. (1)	Daily Consumption * Max./hr.	Maximum Heat Input MBTU/hr. (max 2-hour)
Coal (1.3%S) Annual Average	137,540 #/hr	186,800 #/hr	2,356

* Units: Natural Gas–MCF/hr.; Fuel Oils, Coal–lbs./hr.

(1) NOTE: 1975 data from HCEPC emission inventory
Fuel Analysis: March 30-31, 1976

Percent Sulfur 1.42 Percent Ash 7.88

Density N.A. lb./gal.

Heat Capacity 11,662 BTU/lb. N.A. BTU/gal.

Other Fuel Contaminants

G. Describe briefly, without revealing trade secrets, the processes/operations generating the airborne emissions identified in this application.

Coal is burned to generate steam which is used to generate electricity.

H. Indicate liquid or solid wastes generated and method of disposal:

Collected fly ash is pneumatically transferred to a storage silo where it is sold and loaded into truck or rail cars.

I. Emission Stack Geometry and Flow Characteristics, (Provide Date for each Stack).

Stack Height 306' ft, Stack Diameter 10.3 ft.

Gas Flow Rate 498,000 (avg.)[1] / 681,000 (max.) ACFM, Gas Exit Temperature 288 °F

J. Required Supplements:

1. Total process input rate and product weight – show deviation. $2,356 \times 10^6$ BTU/hr maximum 2-hour heat input operating range is from approximately 35% load to 100% load
2. Efficiency Estimation.
   N/A
3. An 8½" x 11" flow diagram, which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate whether raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particulates are evolved and where finished products are obtained.
   See attached Flow Diagram (Sheet 3-C1)
4. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
   See attached plot plan (Sheet 3-C2)
5. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways.
   See attached location map (Sheet 3-C3)
6. If applicable, provide a brief description of the control device or treatment system serving the discharge point for airborne contaminants identified in this application. Include details of the manufacturer, model, size, type and capacity for control/treatment device and the features of the discharge point (height above ground, diameter, period(s) of discharge and discharge temperature). Research-Cottrell electrostatic precipitator See Item I above for stack discharge characteristics. (See Sheet 5-C1 for typical design
7. Plans for storm water control during and after construction.
   All wastewater from the station will be transported to an evaporation/percolation pond for treatment and disposal.

Note:
(1) 1975 HCEPC Emission Inventory

INCINERATOR INFORMATION

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patho-logical)	Type V (Liq. & Gas By-prod.)	Type VI (Solid By-prod.)
Lbs./Hr. incinerated							

Description of Waste _____

Total Weight Incinerated lbs./hr. _____ Design Capacity lbs./hr. _____

Approximate Number of Hours of Operation per Day _____, days/week _____

Manufacturer _____ Model No.: _____

Date Constructed: _____

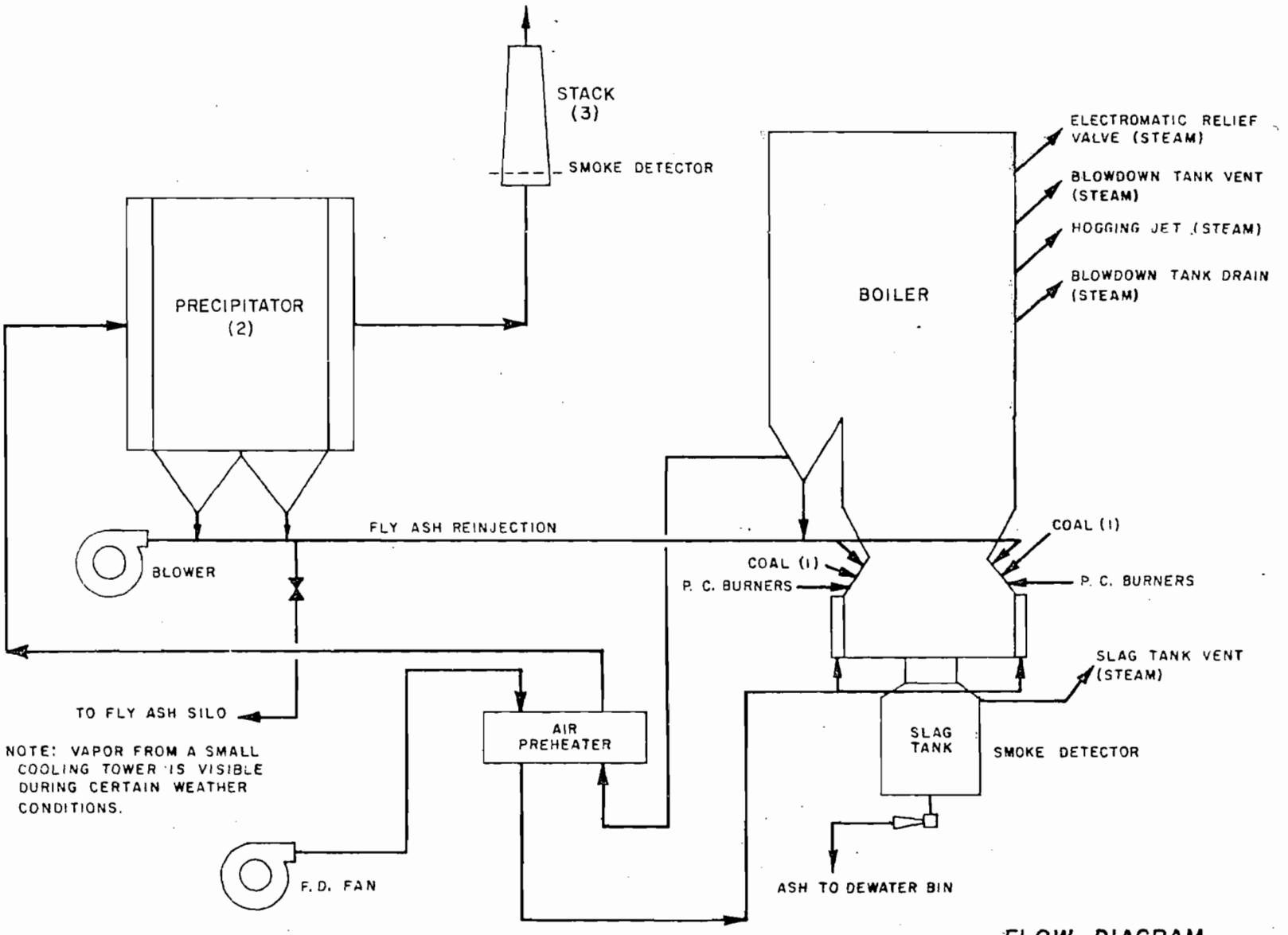
	Volume (ft. *)³	Heat Release (BTU/hr.)	Fuel		Temp. (° F)
			Type	BTU/hr.	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp.: _____ °F

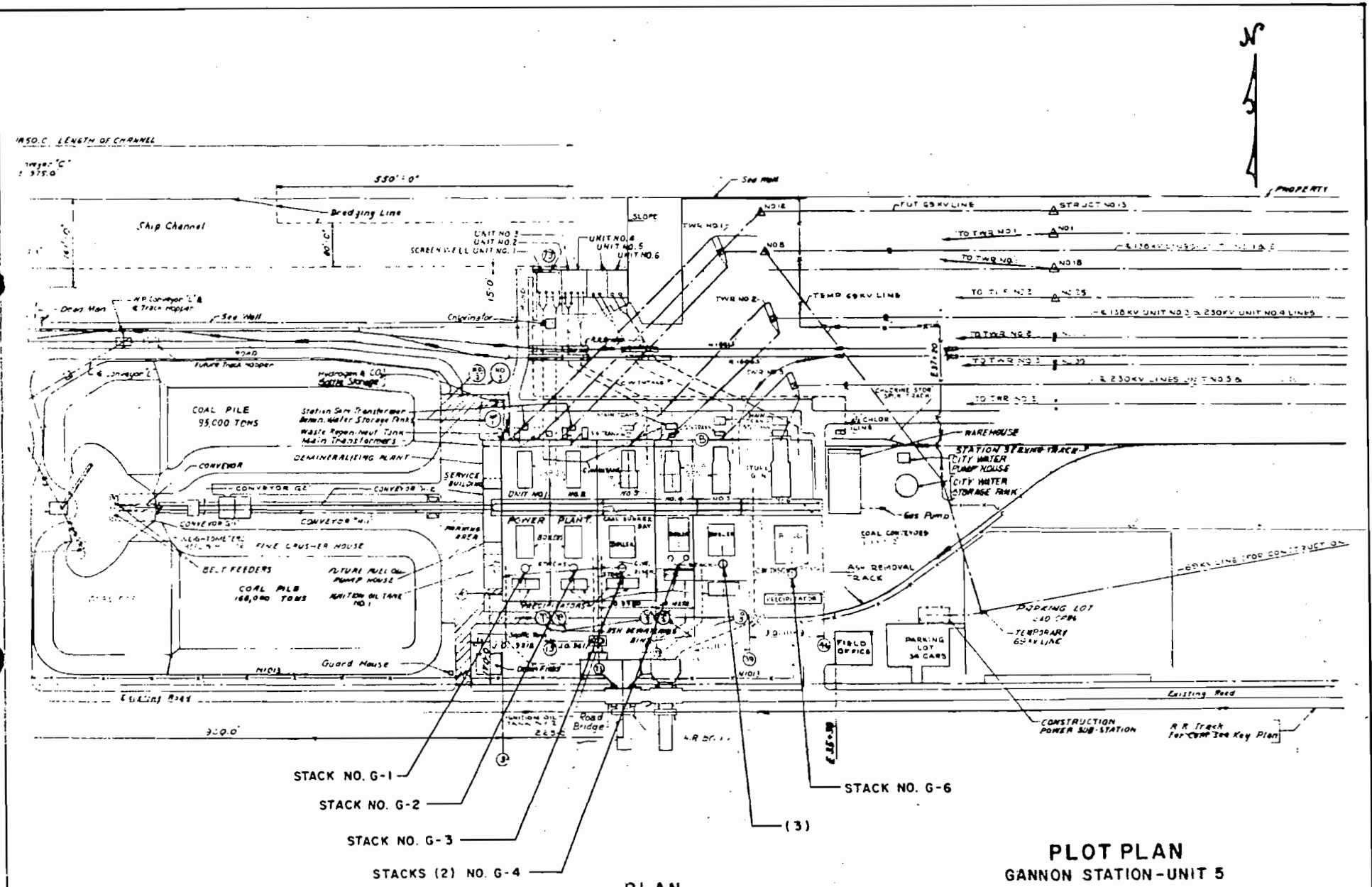
Type of Pollution Control Device [ ] Cyclone [ ] Wet scrubber [ ] Afterburner
[ ] Other (Specify): _____

Brief Description of Operating Characteristics of Control Device: _____

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



FLOW DIAGRAM
GANNON STATION-UNIT 5
TAMPA ELECTRIC COMPANY



PLAN

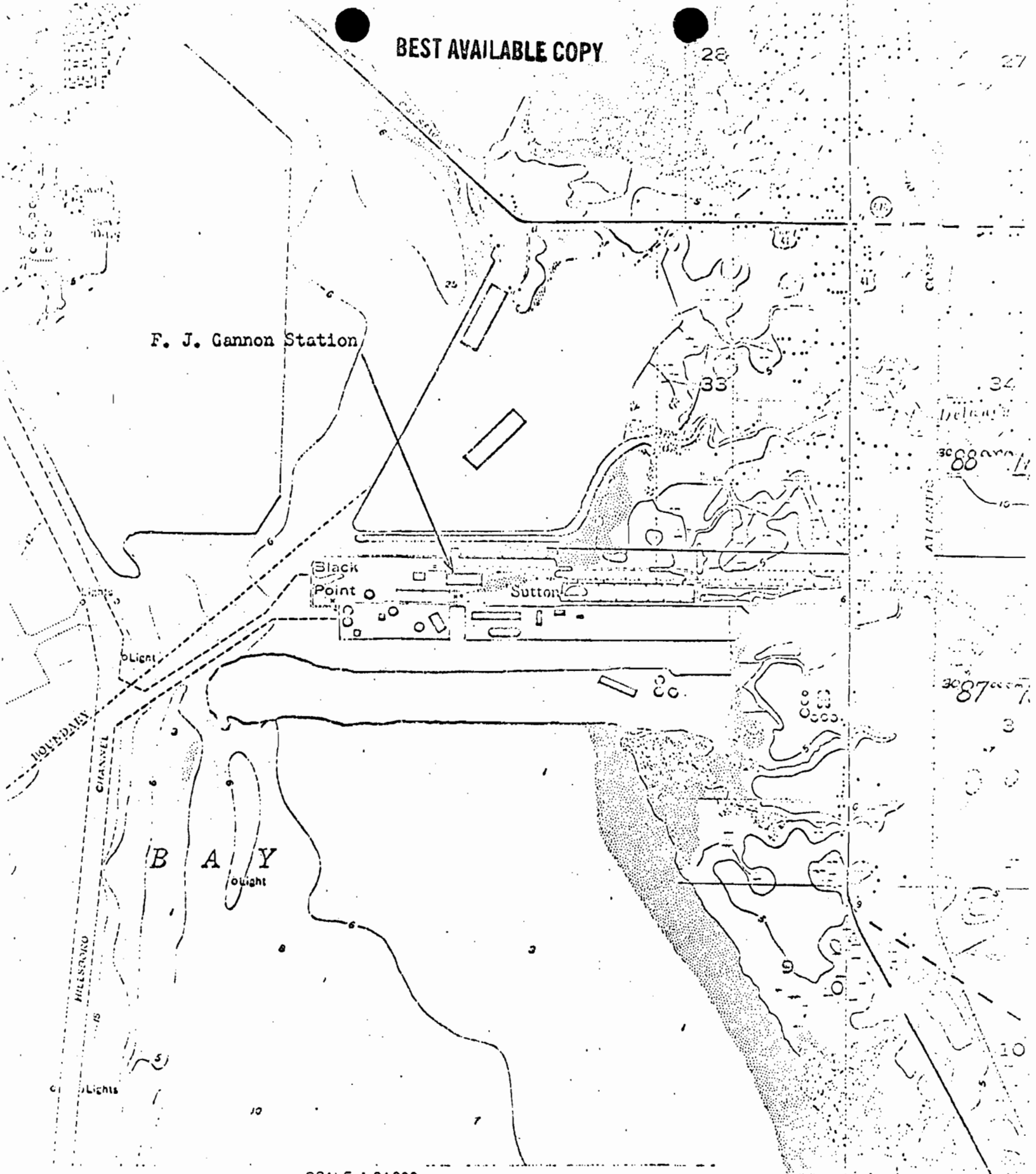
PLOT PLAN

GANNON STATION - UNIT 5

TAMPA ELECTRIC COMPANY

STONE & WEBSTER ENGINEERING CORPORATION

3 - C2



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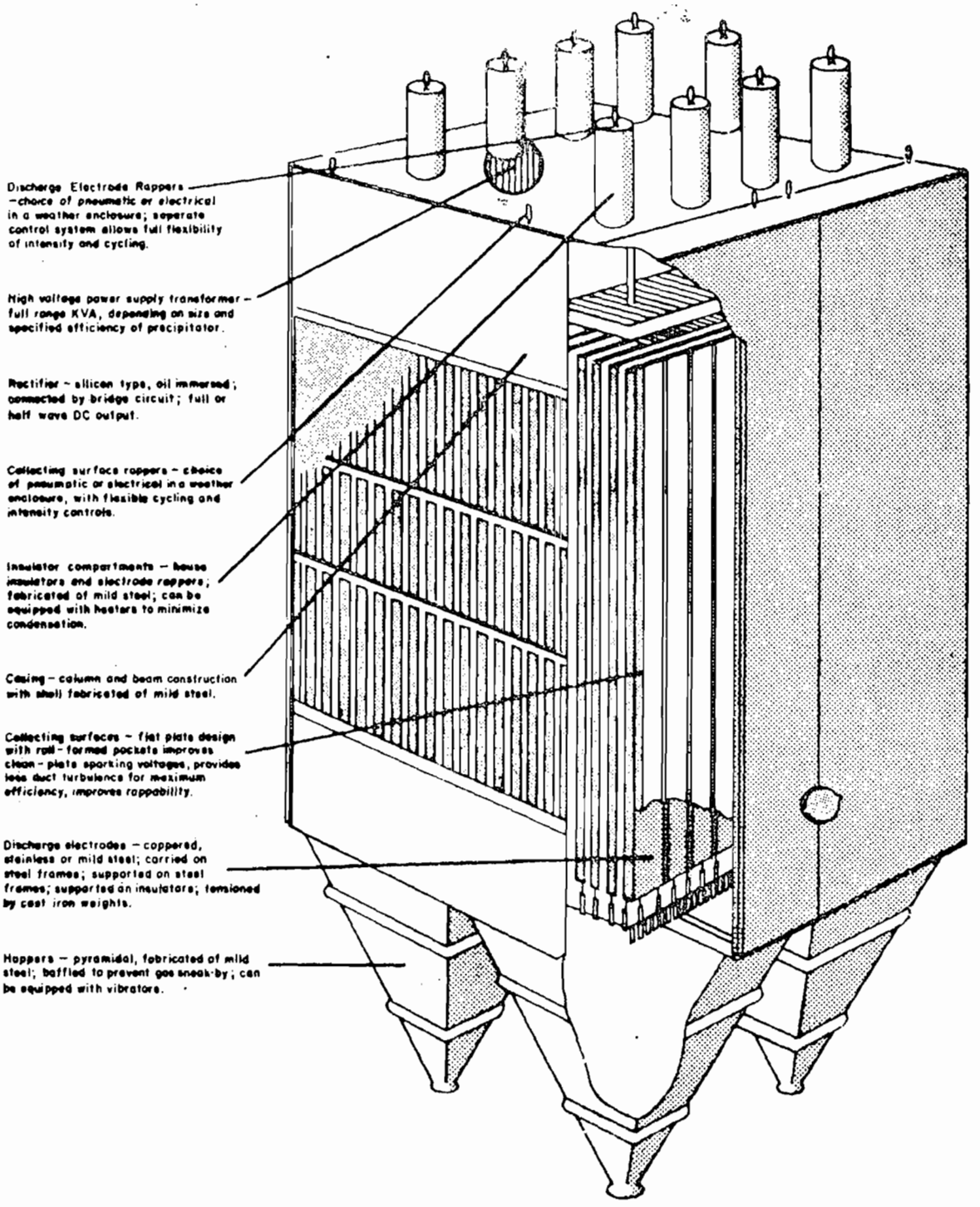


ELECTROSTATIC PRECIPITATOR

GANNON STATION-UNIT 5

TAMPA ELECTRIC COMPANY

STONE & WEBSTER ENGINEERING CORPORATION

5-C1

Unit 5

29-950

State of Florida
Department of Air and Water Pollution Control

Application For Permit to Operate Air Pollution Control Facilities

Applicant (Owner or authorized agent): H. A. Moshell, Jr.
General Manager of Production
(Name and Title)

Name of Establishment: TAMPA ELECTRIC COMPANY
F. J. Gannon Station - No. 5 Boiler
(Corporation, Company, Political SD, Firm, etc.)

Mailing Address: P.O. Box 111 Tampa, Florida 33601

Location of Pollution Source: Port Sutton Road (Number and Street) Tampa (City)
Hillsborough (County)

Nature of Industrial Operation: Generation of Electricity

Permit Applied For Operating:

- New Source ☐
- Existing Source ☒
- Existing Source after modification ☐
- Existing Source after Expansion ☐
- Existing Source After relocation, expansion or reconstruction ☐

Project Engineer:

B. D. Kitching
Name

TAMPA ELECTRIC COMPANY
Firm

P.O. Box 111, Tampa, Florida 33601
Mailing Address

B. D. Kitching
Signature

6503
Florida Registration Number

For Department's Use Only Permit No. #5 Date:

1-D

The undersigned owner or authorized representative* of TAMPA ELECTRIC COMPANY is fully aware that the statements made in this form and the attached exhibits and statements constitute the application for a Operating Permit from the Florida Department of Air and Water Pollution Control and certifies that the information in this application is true, correct and complete to the best of his knowledge and belief. Further, the undersigned agrees to comply with the provisions of Chapter 403 Florida Statutes and all the rules and regulations of the Department or revisions thereof. He also understands that the Permit is non transferable and, if granted a permit, will promptly notify the Department upon sale or legal transfer of the permitted establishment.

H. A. Moshell, Jr.

Signature of owner or agent.

H. A. Moshell, Jr.
General Manager of Production

Name and Title

Date: 2/25/71

*Attach letter of authorization.

Information Regarding Pollution Sources and Proposed Control Facilities

1. Estimated cost of proposed control facilities $ 921,761.

2. Prepare and attach an 8½" x 11" flow diagram, without revealing trade secrets, identifying the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particulates are evolved and where finished products are obtained.
   P. 3-D1

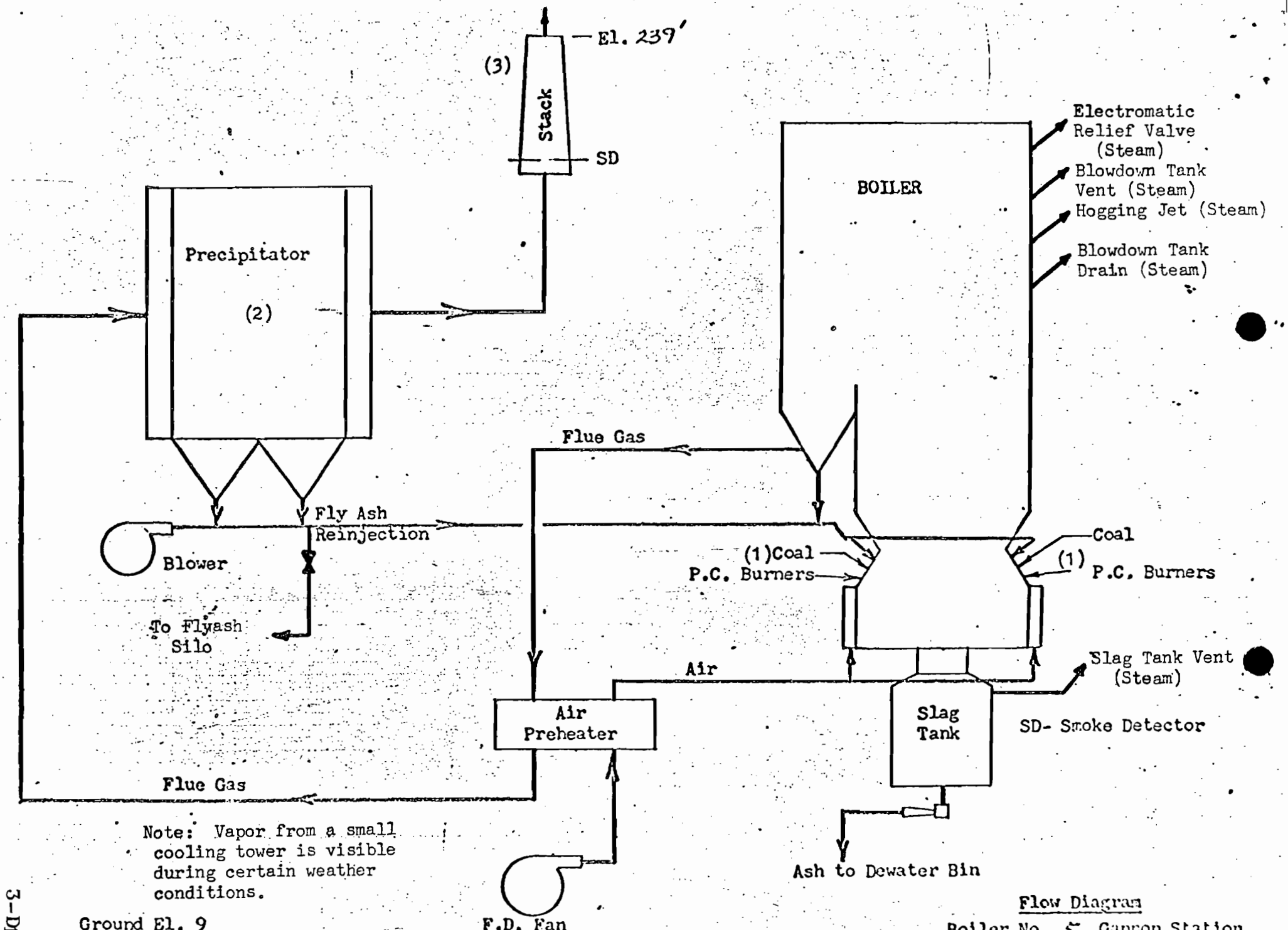
3. Include an 8½" x 11" plot plan showing location of manufacturing processes and location of outlets for airborne emissions. Relate all flows to the flow diagram.
   P. 3-D2

4. Submit an 8½" x 11' plot plan showing the exact location of the establishment and points of discharge in relation to the surrounding area, residences and other permanent structures and roadways.
   P. 3-D3

I General

A. Raw Materials and Chemicals Used.

Description	Utilization Tons/day, Lbs./day, etc.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	Percent Dry Weight	
None				

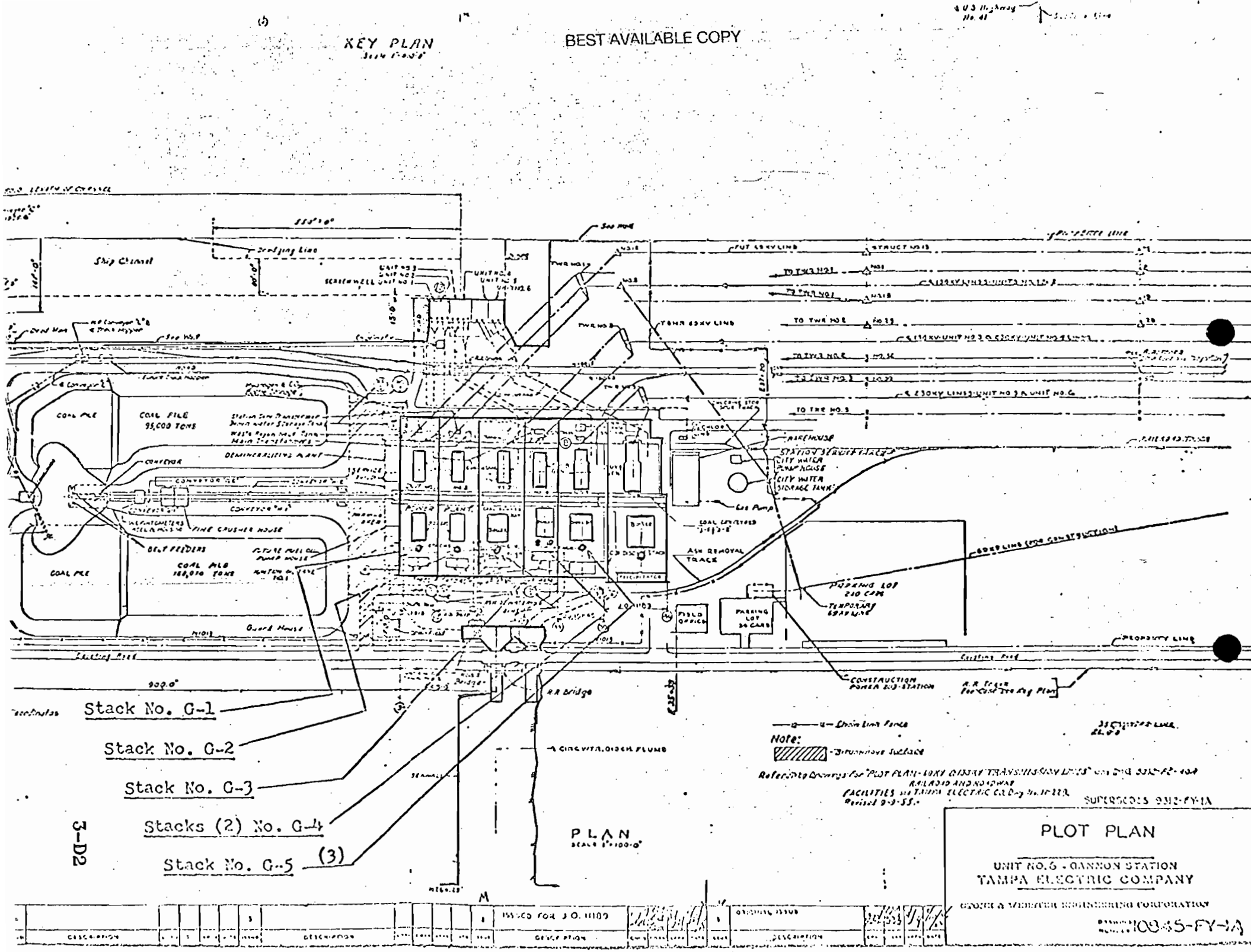


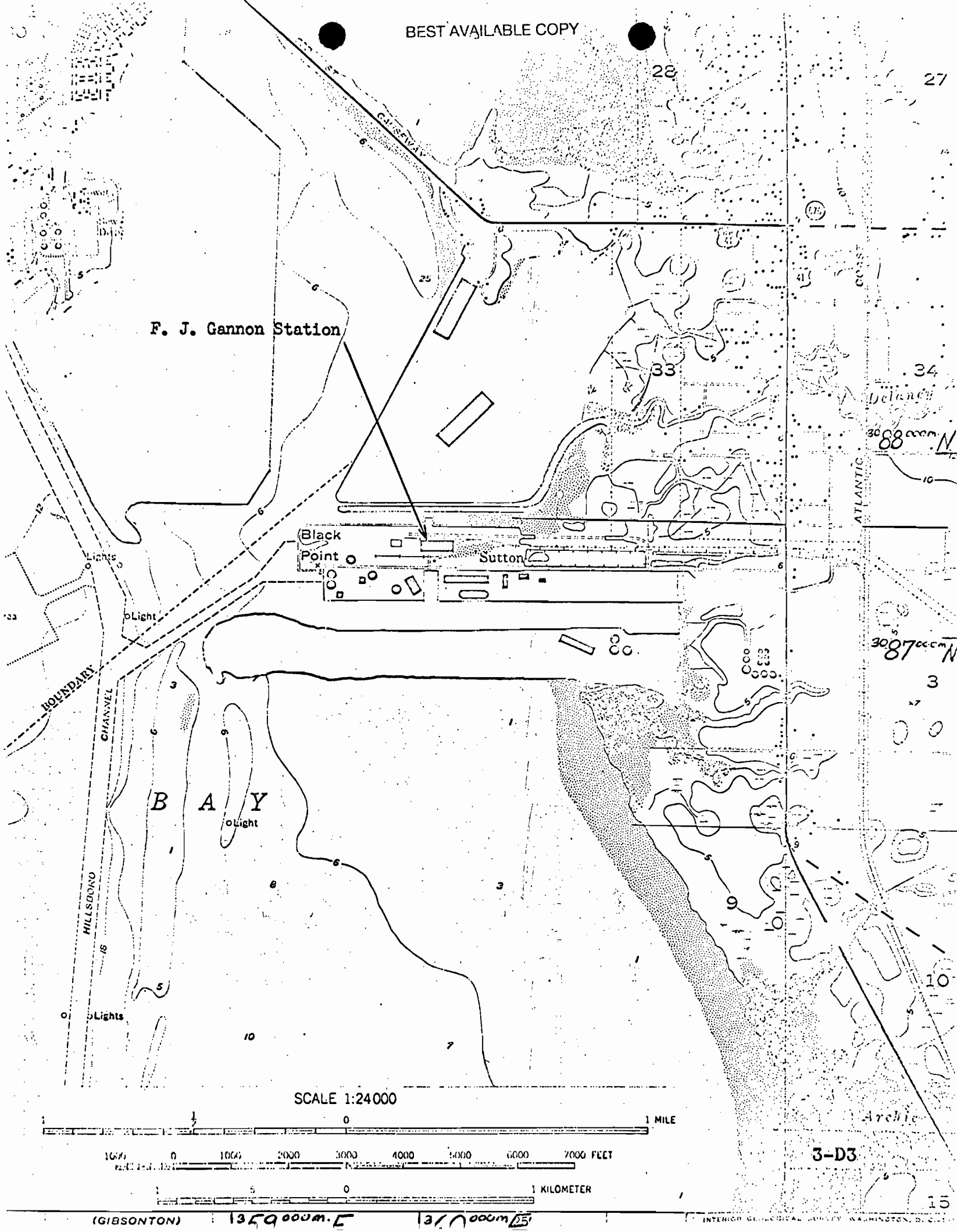
Note: Vapor from a small cooling tower is visible during certain weather conditions.

Ground El. 9

Flow Diagram

Boiler No. 5 Gannon Station
Tampa Electric Co.
Dwg. No. PD 10766-1 1-7-66





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INTERIOR GEOLOGICAL SURVEY, WASHINGTON, D. C.

3-D3

B. Fuels

Type (Be Specific)	Daily Consumption	Gross Maximum Heat Output	Relate to Flow Diagram
Coal	3,630,000 lb/day	4.13×10^{10} BTU/day 1721 MM Btu/hr.	(1)

C. Products

Description	Average Daily Production (Tons/Day. Lbs/Hr. etc.)
Electricity	4,180 MWH/day = 175 MW

D. Normal operation: Hours/Day 24 hr/day Day and Week 7 days/wk

If operation or process is seasonal, describe: _____

II Identification of Air Contaminants

Compounds of:		Also –			
Chlorine	☐	Hydrocarbons	☐	Acid Mists	☐
Flourine	☐	Smoke	☐	Odors	☐
Nitrogen	☐	Fly Ash	☒	Radioisotopes	☐
Sulfur	☒	Dusts	☐	Other _____	☐

Specific Compounds SO_2, SO_3

III Air Pollution Control Devices

Contaminant	Control Device	Relate to Flow Diagram	Note 1 Operating Efficiency	Conditions (Particle Size Range, Temp. etc.)
Ash	Electrostatic Precipitator	(2)	99.3%	57.1 ft/sec - 288° F
SO_x	Stack	(3)	N/A	57.1 ft/sec - 288° F

Provide a brief description of the control device or treatment system. Attach separate sheets giving details regarding principle of operation, manufacturer, model, size, type and capacity of control/treatment device and the basis for calculating its efficiency. Show any bypasses of the control device and specify when such bypasses are to be used and under what conditions.

This piece of equipment is designed to remove solid particulate matter from the flue gases leaving the boiler.

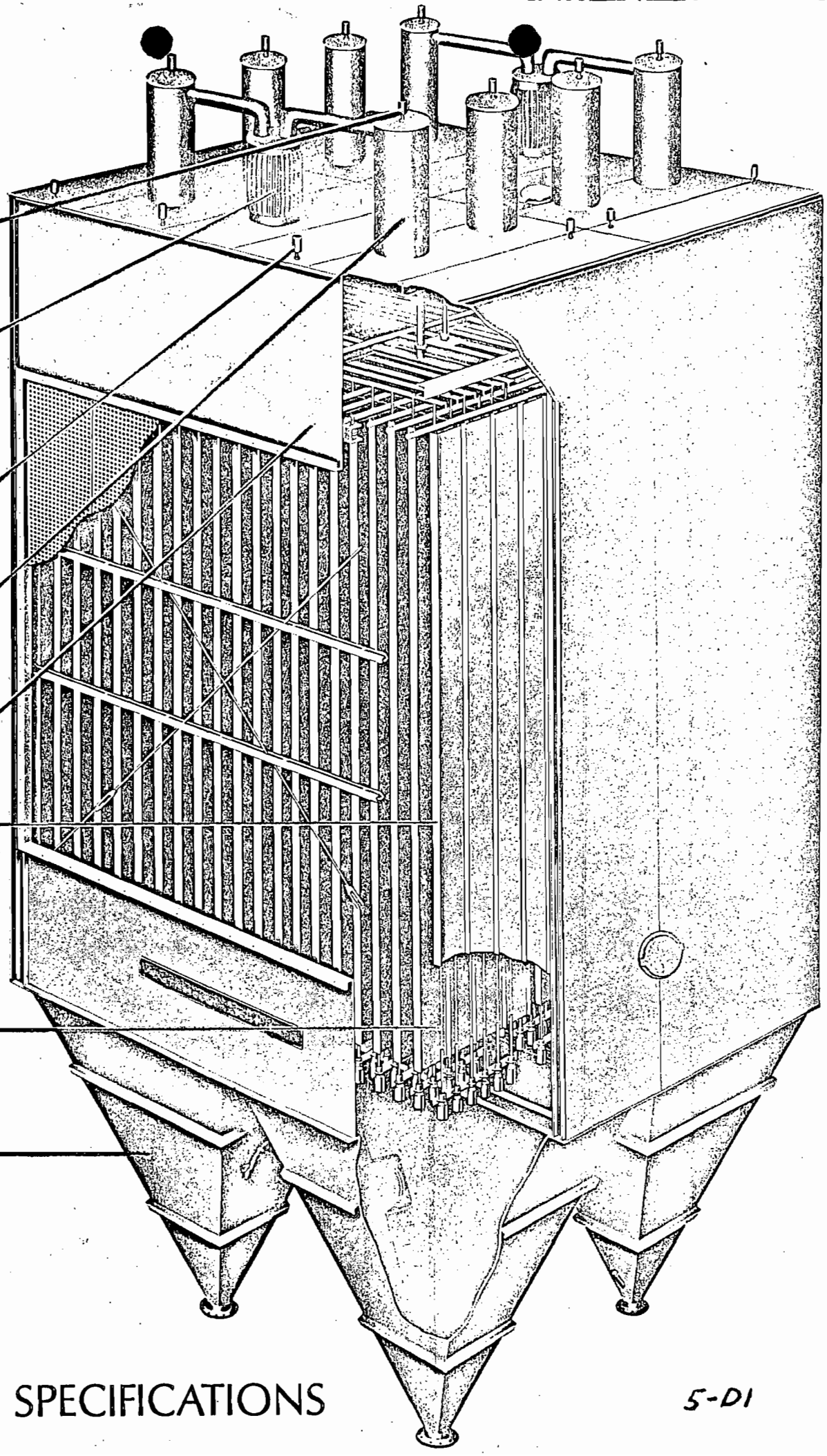
A cutaway view of a typical electrostatic precipitator is shown on Page 5-D1. Gas flow through the precipitator is between the parallel plates designated as "collecting surfaces".

The operating principle and basis for calculating the efficiency are shown on page 5-D2 and 5-D3 respectively. Some additional information regarding the precipator for this unit follows.

Manufacturer - Research-Cottrell

Design air flow - 700,000 cfm at 289° F
Guaranteed removal efficiency - 98.5%
at design conditions

There are no by-passes of the precipitator.



Discharge electrode rappers —choice of pneumatic or electrical in a weather enclosure; separate control system allows full flexibility of intensity and cycling.

High Voltage Power Supply Transformer—full range KVA, depending on size and specified efficiency of precipitator

Rectifier—silicon type, oil immersed; connected by bridge circuit; full or half wave DC output

Collecting surface rappers—choice of pneumatic or electrical in a weather enclosure, with flexible cycling and intensity controls.

Insulator compartments—house insulators and electrode rappers; fabricated of mild steel; can be equipped with heaters to minimize condensation.

Casing—column and beam construction with shell fabricated of mild steel.

Collecting surfaces—flat plate design with roll-formed pockets improves clean-plate sparking voltages, provides less duct turbulence for maximum efficiency, improves rappability.

Discharge electrodes—coppered, stainless or mild steel; carried on steel frames; supported on insulators; tensioned by cast iron weights

Hoppers—pyramidal, fabricated of mild steel; baffled to prevent gas sneak-by; can be equipped with vibrators

GENERAL SPECIFICATIONS

5-D1

OPERATING PRINCIPLE OF ELECTROSTATIC PRECIPITATOR

Particles suspended in a gaseous medium enter the precipitator, passing through ionized zones around high voltage electrode wires. These high voltage electrodes, through a corona effect, emit negatively charged ions into the gases surrounding the electrode.

The negatively charged gas field around each electrode wire ionizes passing particulates, causing the particulates to migrate to the electrode of opposite polarity, the collector plates.

The charged particulates gather on the grounded collector plates and lose their charge. Rappers shake loose the agglomerate which fall into the collection hoppers for removal.

BASIS FOR CALCULATING PRECIPITATOR EFFICIENCY

A method similar to ASME Power Test Code - 27 is used to determine dust loadings. Very briefly the method is as follows:

1. Unit is base loaded for 2 to 4 hours (steady load).

2. Velocity profile of the inlet and outlet ducts is determined using a pitot tube, draft gauge, and thermocouple.

3. Inlet and outlet ducts are sampled simultaneously and isokinetically using alundum thimbles as the filtering medium.

4. Amount of dust per unit time is obtained and efficiency is arrived at by using the following formula:

$$\frac{\text{Inlet dust concentration} - \text{Outlet dust concentration}}{\text{Inlet dust concentration}} \times 100 = \text{efficiency}$$

IV. Contaminant Balance

From contaminant content in raw materials, waste products, and manufactured products, summarize daily contaminant flow:

	Pounds Contaminant per Day	
	Input	Output
List Raw Materials:		
Coal Ash	431,000	
Coal Sulfur	139,000	
List Manufactured Products:		
Electricity		
List Solid Wastes:		
Bottom Slag		428,290
List Liquid Wastes:		
None		
Totals	570,000	428,290

Airborne Wastes (Total input minus total output)

141,710

Note: If more than one contaminant, specify each
Contaminants recovered in control devices should be shown as either a liquid or a solid waste.

V. Discharged Emmissions to Atmosphere

A. Discharge Points and Design Conditions

Note 2

Discharge Point Description	Relate to Flow Diagram	Height above Ground (ft.)	Cross Sect. Area (sq. ft.)	Periods of Flow Hrs./ Day	Periods of Flow Days/ Year	Temp. of Discharge (°F)
Stack	(3)	230	167	23.0	273	288° F

B. Tabulation of Discharged Contaminants

Note 3

	Discharge Point – Relate to Flow Diagram	Flow Rate at Std. Cond. (cfm)	Total Contaminants Discharged: Particulates Gr/ft3 (Std.Cond.)	Particulates lbs./ Day	Other Contaminants (~~NOx~~ SO2 ~~NOxSOx~~) Gr/ft3 (Std. Cond.)	Other Contaminants lbs/ Day	Other Contaminants Gr/ft3 (Std.Cond)	Other Contaminants lbs/ Day
Avg. Cond.	Stack – (3)	405,000	0.034	2,710	3.82	278,000		
Peak Cond.	Stack – (3)	486,000	0.034	–	3.82	–		
	Totals							

NOTE: Standard conditions used are 20° C and 1 atm.

VI. Treatment and Disposal of Liquid and Solid Waste

1. Identify the contaminants which will be discharged as liquid or solid wastes.

   Bottom slag (ash)

2. Describe the treatment and disposal of liquid and solid wastes. Indicate the concentrations and volume of individual contaminants in treated wastes before disposal.

There is 428,290 16/day of slag produced.

The bottom slag is tapped from the bottom of the furnace as a molten liquid. It falls into a tank of water where it rapidly cools and shutters into small pieces (approximately 1/4" in diameter). This water - solid mixture is pumped to a dewatering bin where the water is drained off.

The slag is then carried off by truck to a stockpiling area on the power plant site.

The solid slag is hard, glassy, insoluble in water, and chemically inert. A typical mineral analysis of slag is as follows:

SiO_2 - 41.06%, Fe_2O_3 - 27.46%, Al_2O_3 - 17.00%, CaO - 5.47%, SO_3 - 4.91%, K_2O - 1.88%, TiO_2 - 0.83%, MgO - 0.67%, P_2O_5 - 0.37%, Na_2O - 0.25%, Undetermined - 0.10%.

NOTE 1: The operating efficiency shown for the electrostatic precipitator is the efficiency obtained by tests which were conducted in April, 1958. These tests were conducted at the designed maximum continuous load on the boiler. Tests are scheduled and due to be completed by December 31, 1971, which will reflect current efficiencies at the average operating condition. This information will be forwarded to the department as soon as the tests have been completed.

The test method to be used will be similar to the method adopted by the Department of Air and Water Pollution Control for the sampling of solid particulate matter from power plant stack gases.

NOTE 2: The hrs/day figure shown was arrived at by dividing the hours per year that the boiler was in operation for the year 1969 by the number of days in 1969 that the boiler operated.

NOTE 3: The grain loading shown for the average operating condition and the peak emission condition is the grain loading that was obtained by test at the design maximum continuous load on the boiler. This means that, theoretically, the grain loading for the average operating condition should be less than that shown and the grain loading for the peak emission condition could be greater than that shown. Tests are scheduled to obtain what the values actually are.

SUPPLEMENTAL INFORMATION

A flyash silo has been installed as part of the flyash handling system for use with Nos. 4, 5, and 6 Boilers.

No credit has been taken for the possible reduction of flyash to the atmosphere due to a decreased load on the precipitator while the silo system is in service.

One phase of our Test Program will include the use of this equipment to document anticipated improvement in flyash emissions, especially during peak load operation.

We expect to utilize the silo system during times that will yield the maximum environmental effects.