29-976

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. 1 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

[signature]
Signature

6503
Florida Registration Number

For Department's Use Only Permit No. UNIT # 1 Date:

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 $ 468,290.

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

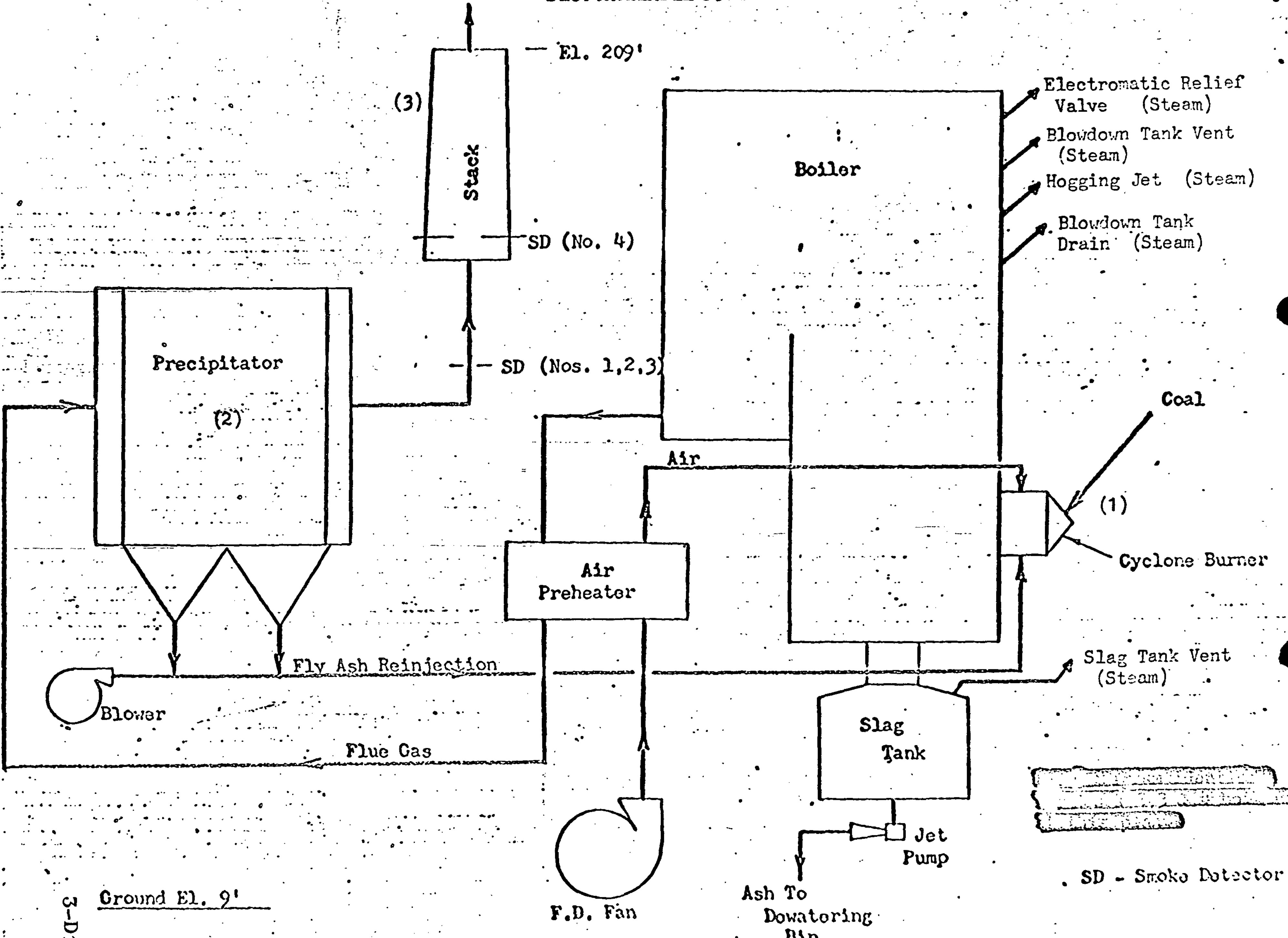
3. Include an 8½" x 11" plot plan showing location of manufacturing processes and location of outlets for airborne emissions. Relate all flows to the flow diagram.
   P. 3-D2

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.

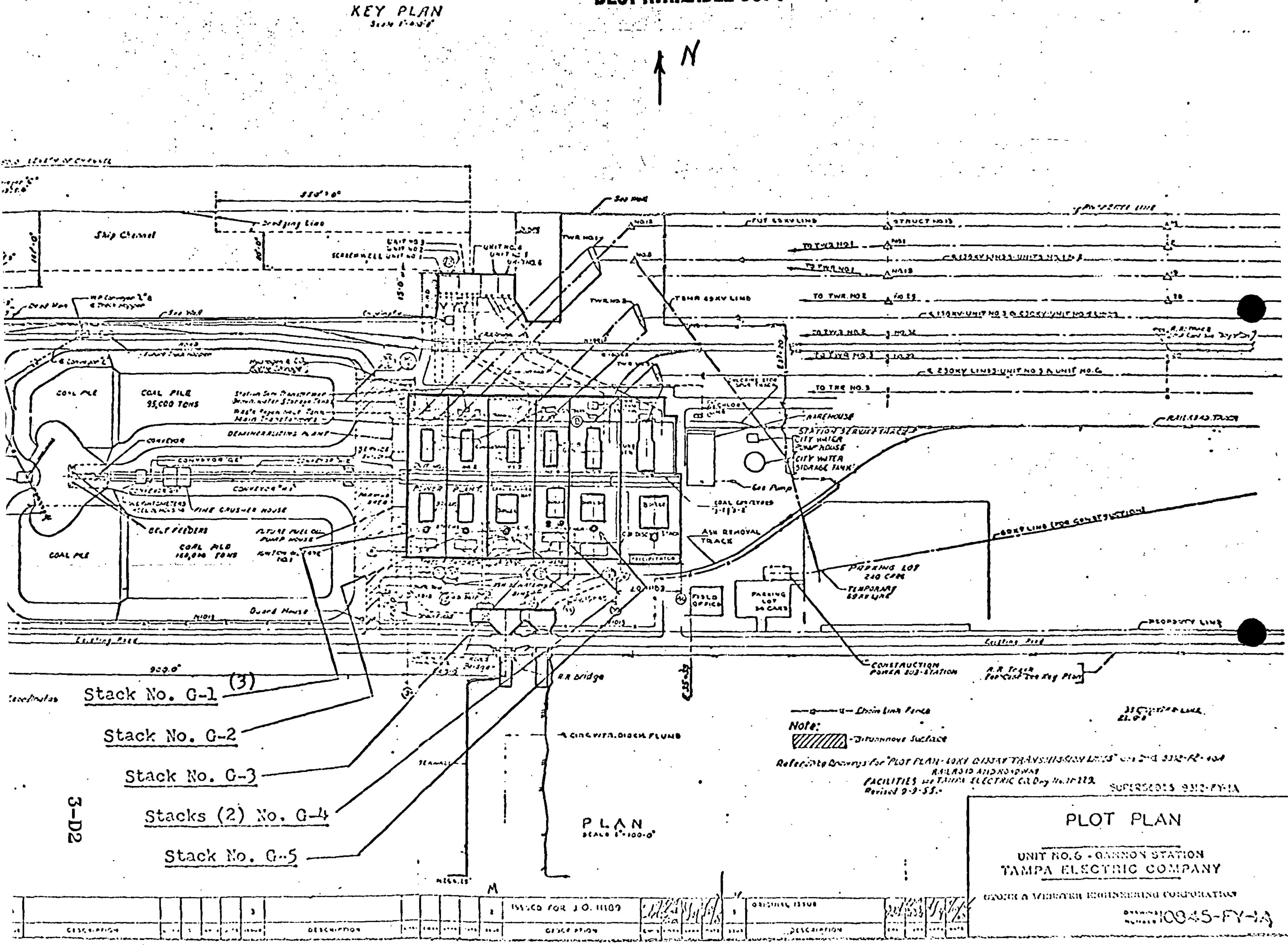
Description	Utilization Tons/day, Lbs./day, etc.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	Percent Dry Weight	
NONE				

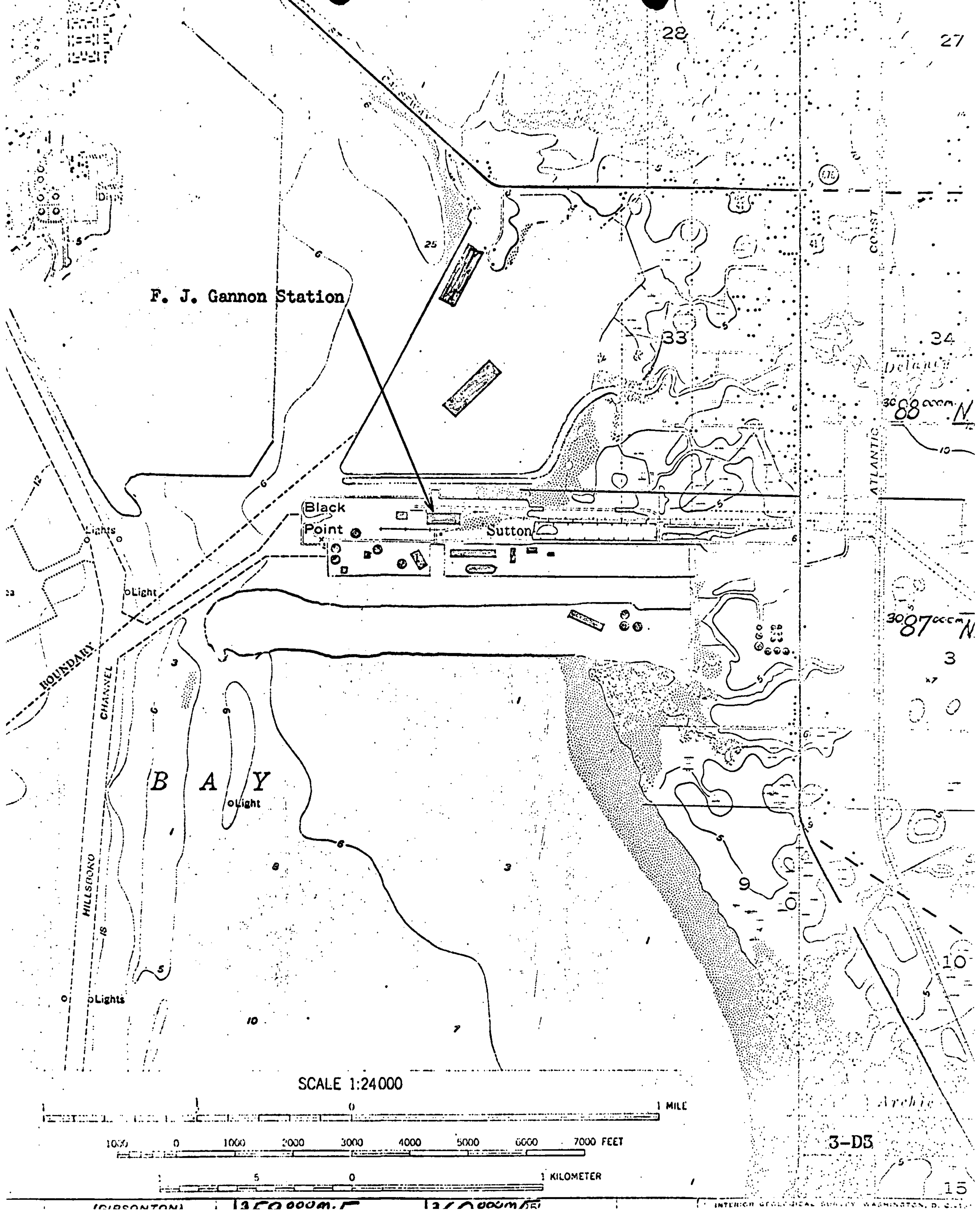


FLOW DIAGRAM
BOILER NO. 1 - GANNON STATION
TAMPA ELECTRIC CO.

3-D1

3/7/66


KEY PLAN
N
Ship Channel
COAL PILE
COAL PILE
95,000 TONS
COAL PILE
COAL PILE
160,000 TONS
DEMINERALIZING PLANT
FINE CRUSHER HOUSE
BELT FEEDERS
CONVEYOR
Guard House
Existing Road
R.R. Bridge
ASH REMOVAL TRACK
WAREHOUSE
CITY WATER STORAGE TANK
FIELD OFFICE
PARKING LOT 240 CARS
TEMPORARY 69KV LINE
CONSTRUCTION POWER SUB-STATION
PROPERTY LINE
RAILROAD TRACK
TO TWR. NO. 3
Stack No. G-1
(3)
Stack No. G-2
Stack No. G-3
Stacks (2) No. G-4
Stack No. G-5
PLAN
Note:
SUPERSEDES 9312-FY-1A
PLOT PLAN
UNIT NO. 6 - GANNON STATION
TAMPA ELECTRIC COMPANY
ISSUED FOR J.O. 11109
ORIGINAL ISSUE
DESCRIPTION
10045-FY-1A


F. J. Gannon Station
Black
Point
Sutton
Lights
Light
BOUNDARY
CHANNEL
HILLSBORO
B A Y
Light
Lights
ATLANTIC
COAST
Delaney
Archie
28
27
33
34
3
10
15
SCALE 1:24000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 5 0 1 KILOMETER
3-D3

B. Fuels

Type (Be Specific)	Daily Consumption	Gross Maximum Heat Output	Relate to Flow Diagram
Coal	1,770,000 lb/day	2.01×10^{10} BTU/day 840 MM Btu/hr	(1)

C. Products

Description	Average Daily Production (Tons/Day. Lbs/Hr. etc.)
Electricity	2,035 MWH/day = 85 MW

D. Normal operation: Hours/Day 24 Day and Week 7 days/week

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	See Note 1 Operating Efficiency	Conditions (Particle Size Range, Temp. etc.)
Fly Ash	Electrostatic Precipitator	(2)	91.3%	29.9ft/sec 309^{0} F
SO_x	None			

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.

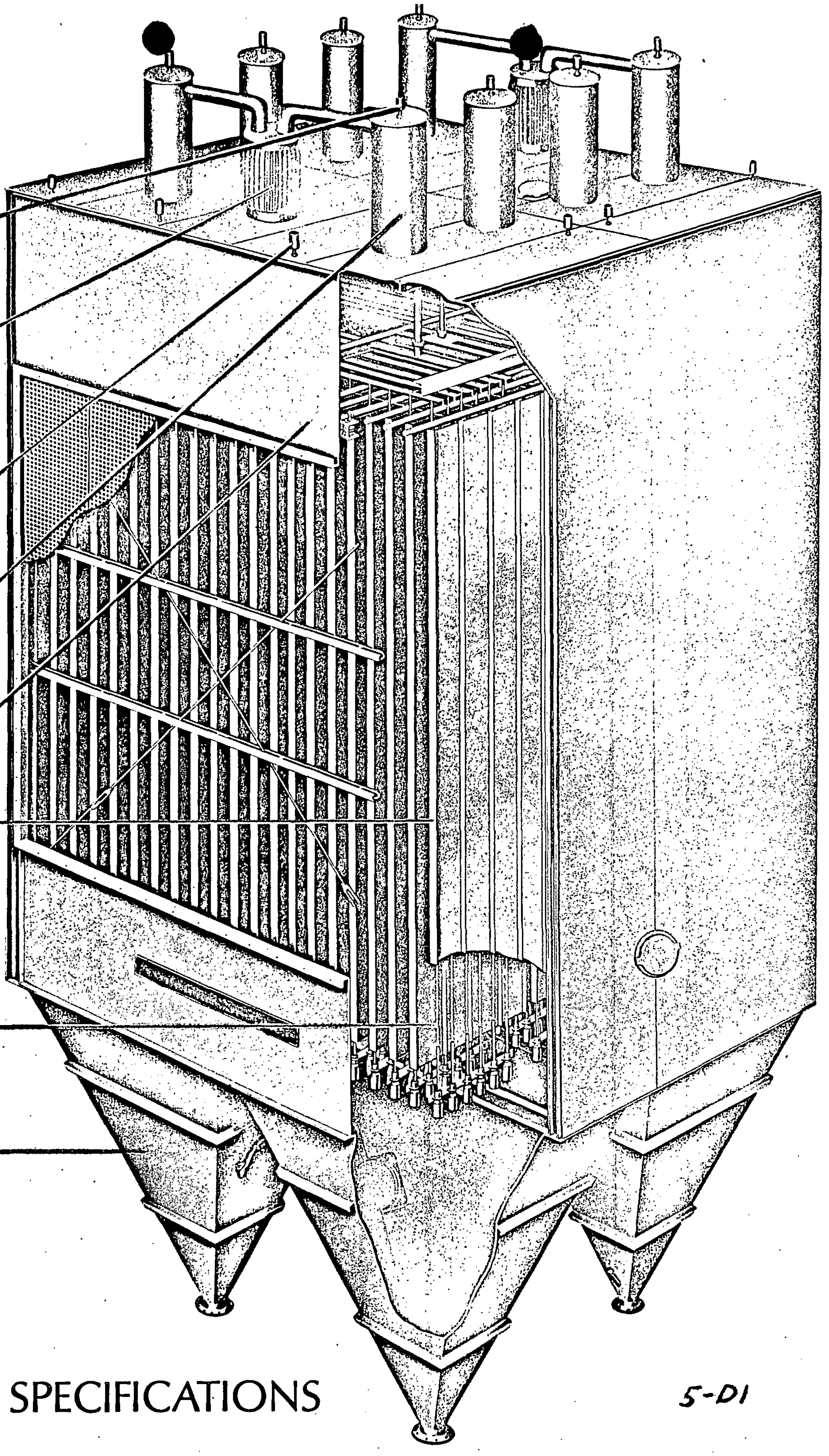
A cutaway view of a typical electrostatic precipitator is shown on Page 5-D1. Gas flow through the precipitator is between the parallel plates designated as "collecting surfaces".

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 - 377,000 CFM
Guaranteed removal efficiency - 90.0%
at design conditions

There are no by-passes of the precipitator.



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:~~ Fuel:		
Coal Ash	210,000	
Coal Sulfur	67,600	
List Manufactured Products:		
Bottom slag (ash)		204,040
List Solid Wastes:		
List Liquid Wastes:		
None		
Totals	277,600	204,040

Airborne Wastes (Total input minus total output)
73,560

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

Discharge Point Description	Relate to Flow Diagram	Height above Ground (ft.)	Cross Sect. Area (sq. ft.)	Periods of Flow (Note 2) Hrs./Day	days/Year	Temp. of Discharge (°F)
Stack	(3)	200	156	23.6	350	309

B. Tabulation of Discharged Contaminants

Total Contaminants Discharged

	Discharge Point – Relate to Flow Diagram	Flow Rate at Std. Cond. (cfm)	Particulates (Note 3) Gr/ft3 (Std.Cond.)	Particulates lbs./Day	Other Contaminants ~~(F)~~, SO2, ~~NOx etc.~~ Gr/ft3 (Std. Cond.)	lbs/Day	Gr/ft3 (Std.Cond)	lbs/Day
Avg. Cond.	Stack – (3)	191,000	0.154	5,960	3.82	132,200		
Peak Cond.	Stack – (3)	253,000	0.154	–	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 204,040 lb/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.