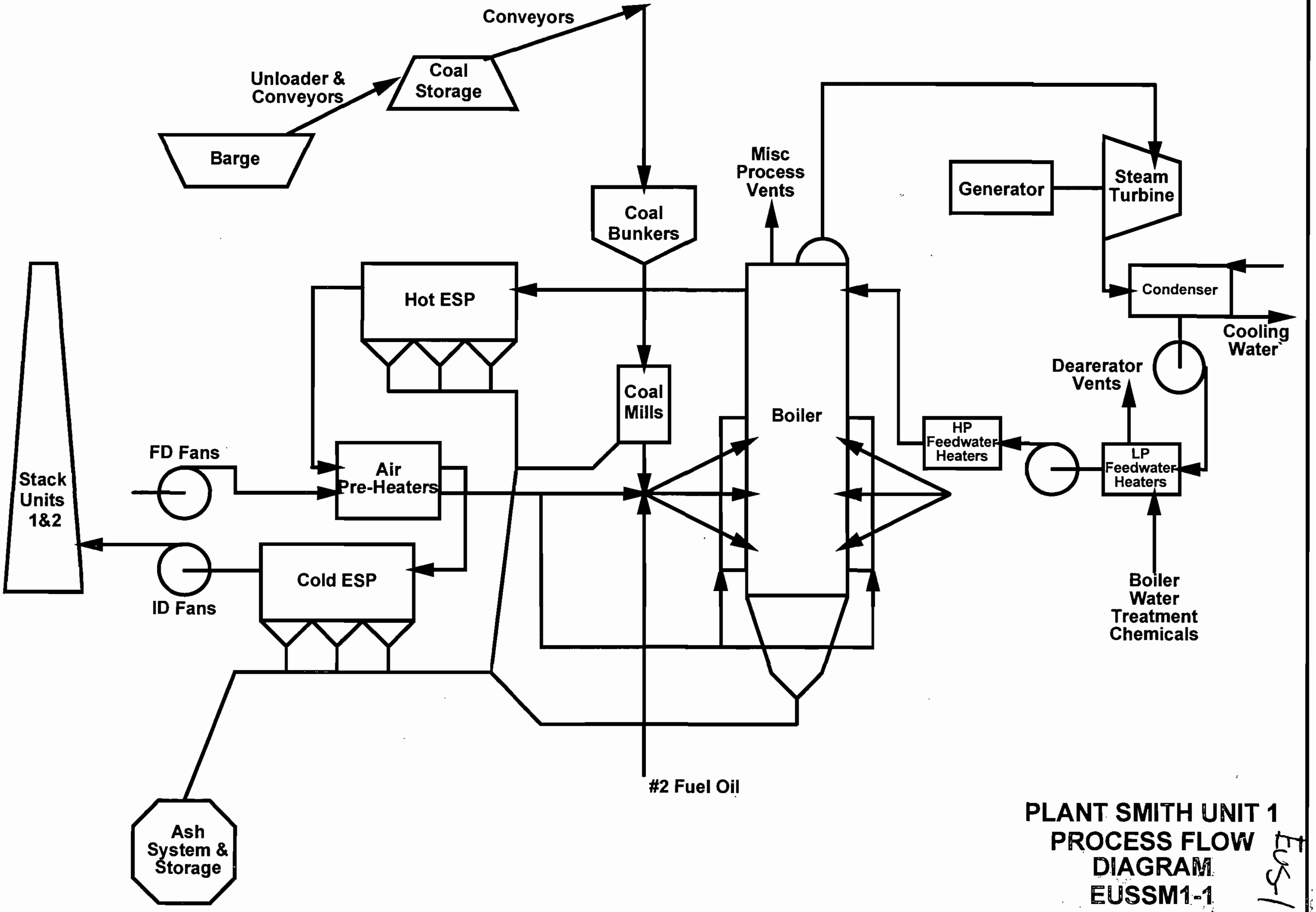
Title V
SMITH ELECTRIC GENERATING PLANT PERMIT APPLICATION

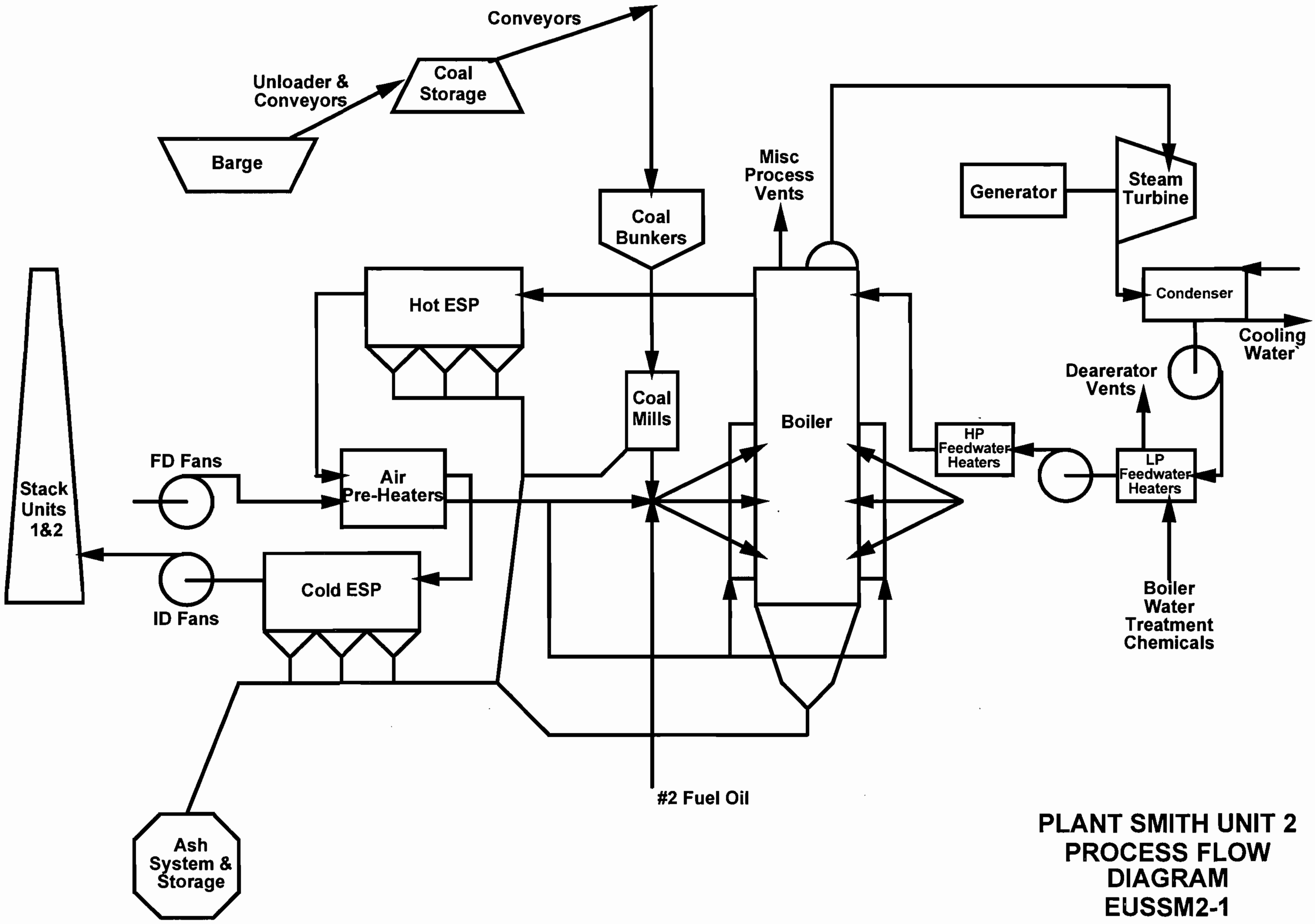
Volume II



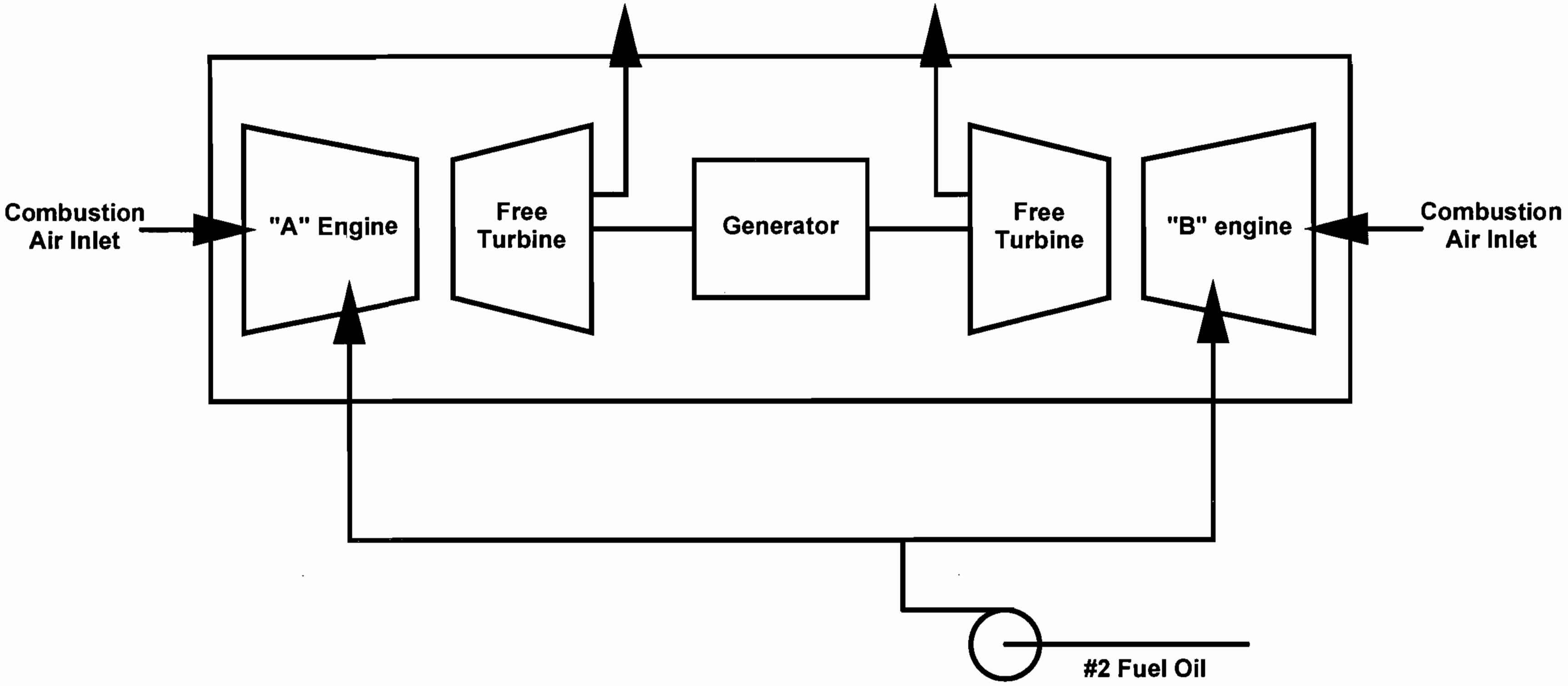
PLANT SMITH UNIT 1
PROCESS FLOW DIAGRAM
EUSSM1-1

eussm1-1.pre

EUS-1

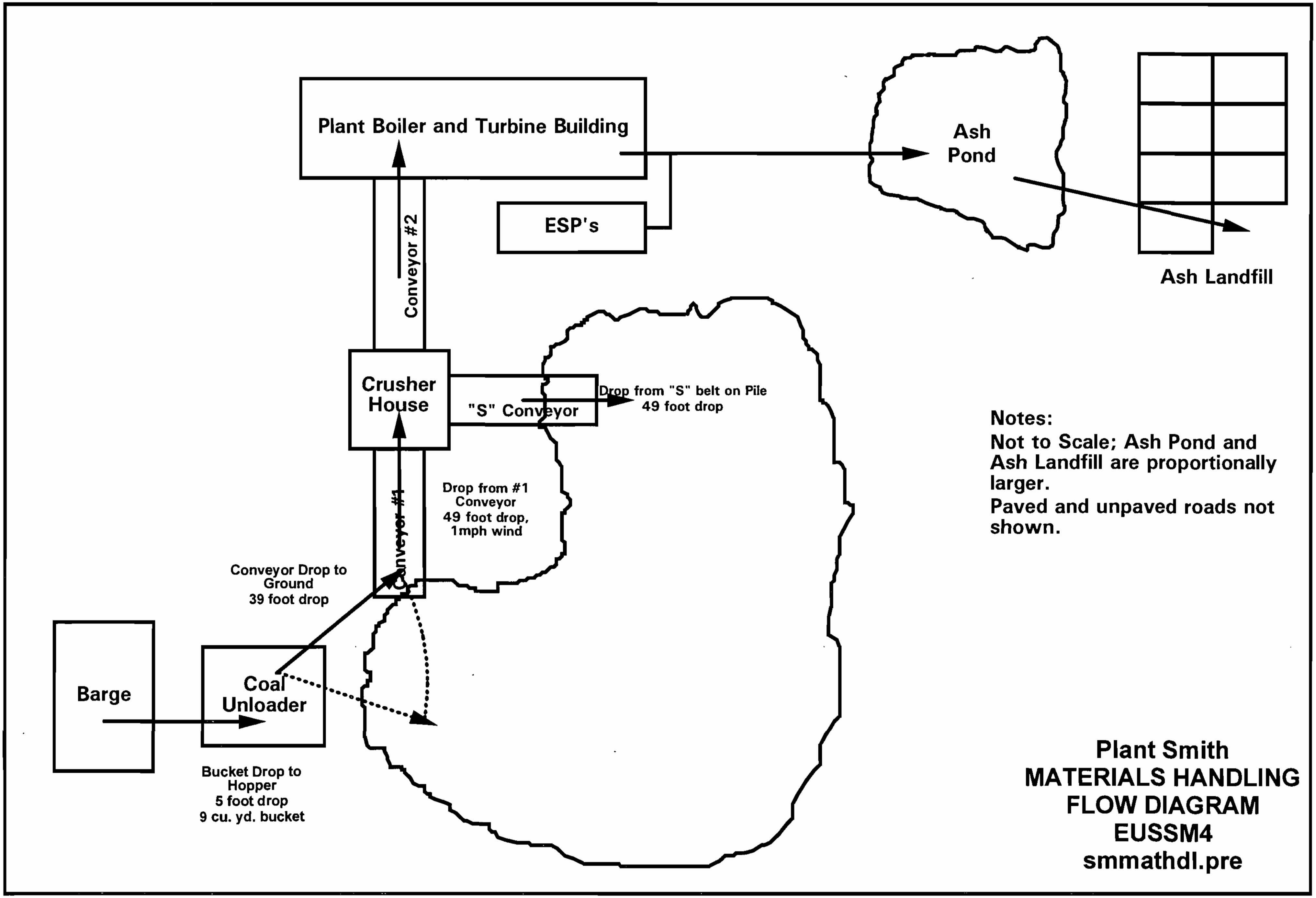


PLANT SMITH UNIT 2
PROCESS FLOW
DIAGRAM
EUSSM2-1
eussm2-1.pre



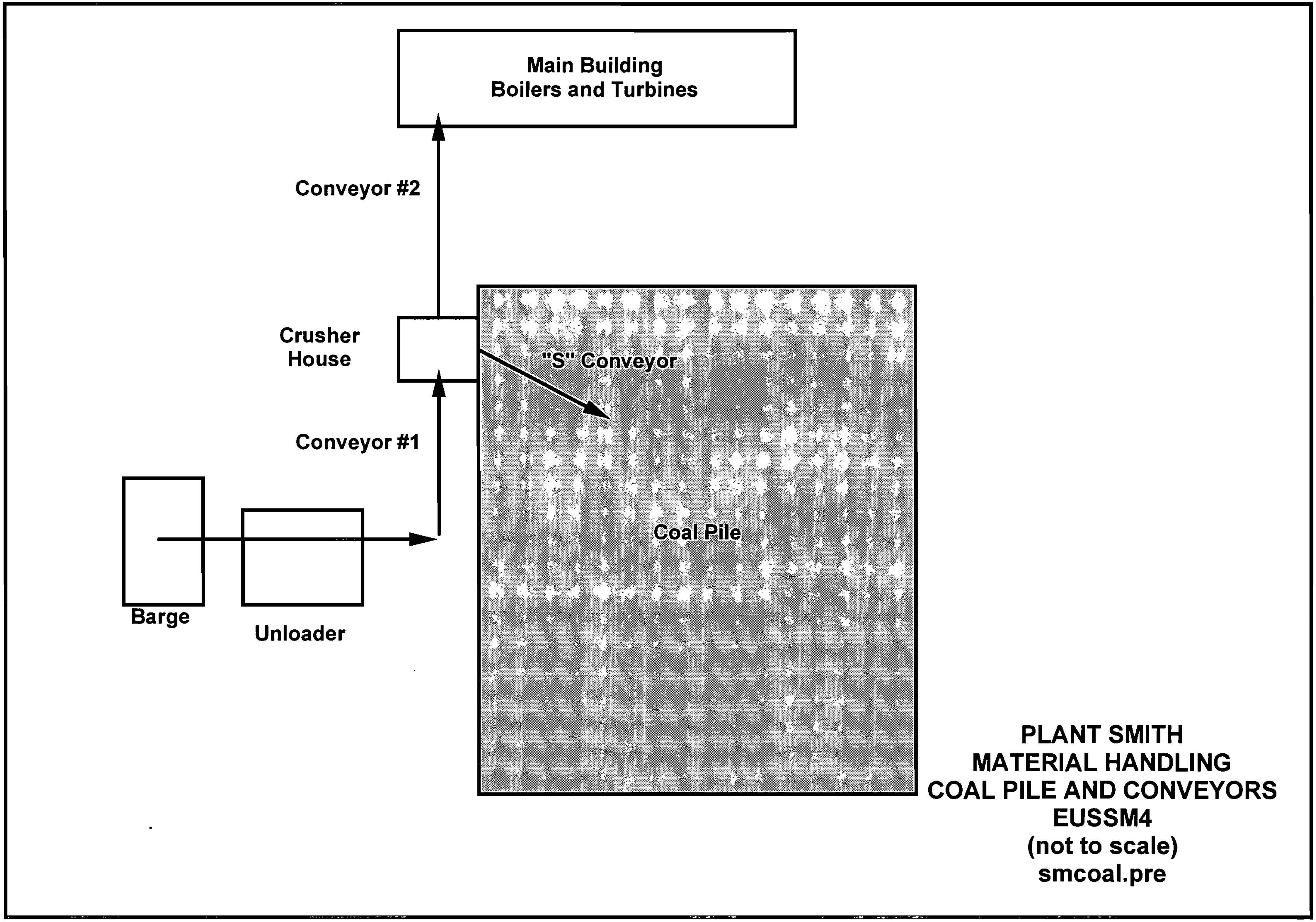
PLANT SMITH
COMBUSTION TURBINE
PROCESS FLOW DIAGRAM
EUSSM3-1

eussm3-1.pre

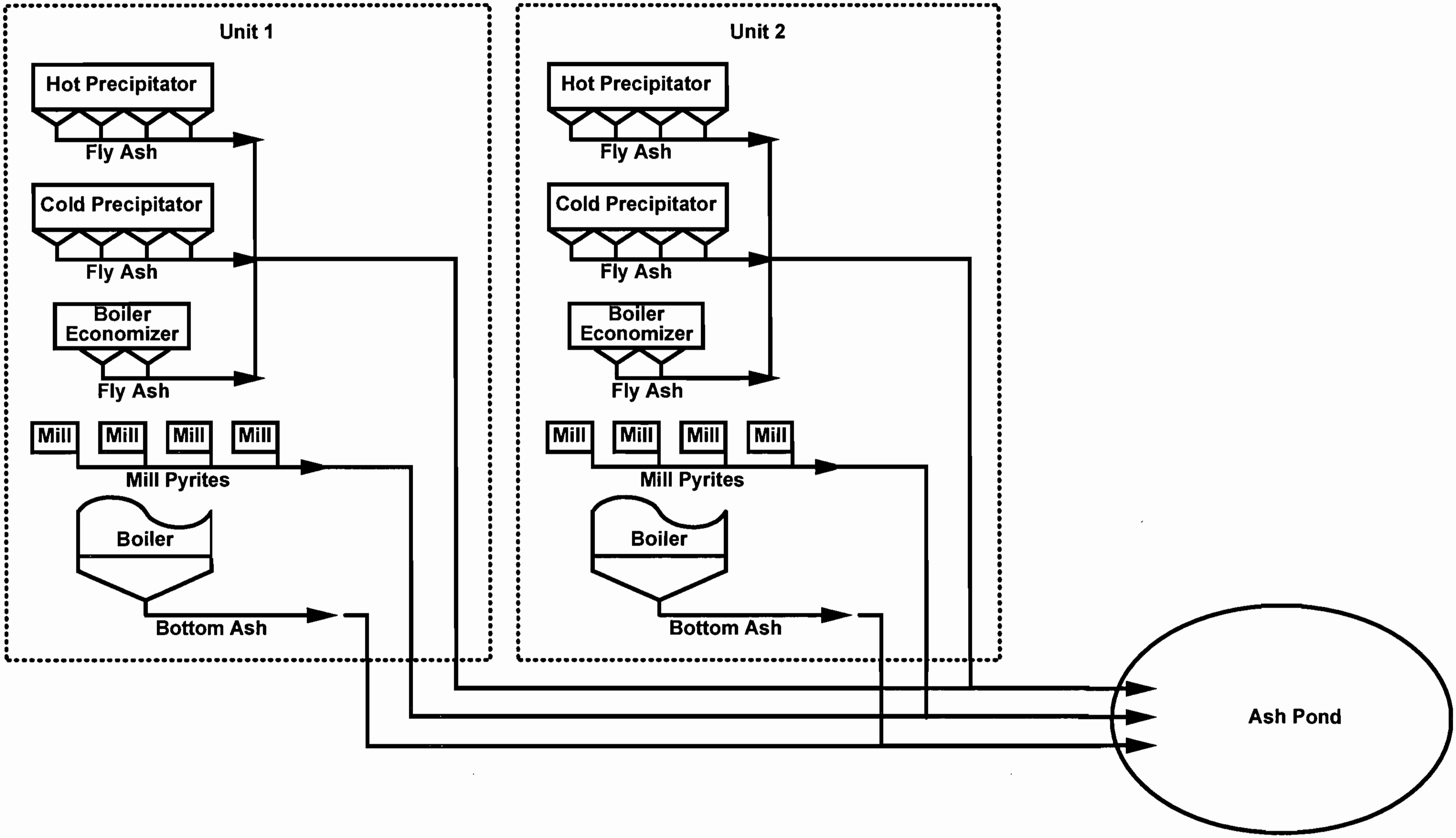


Notes:
Not to Scale; Ash Pond and Ash Landfill are proportionally larger.
Paved and unpaved roads not shown.

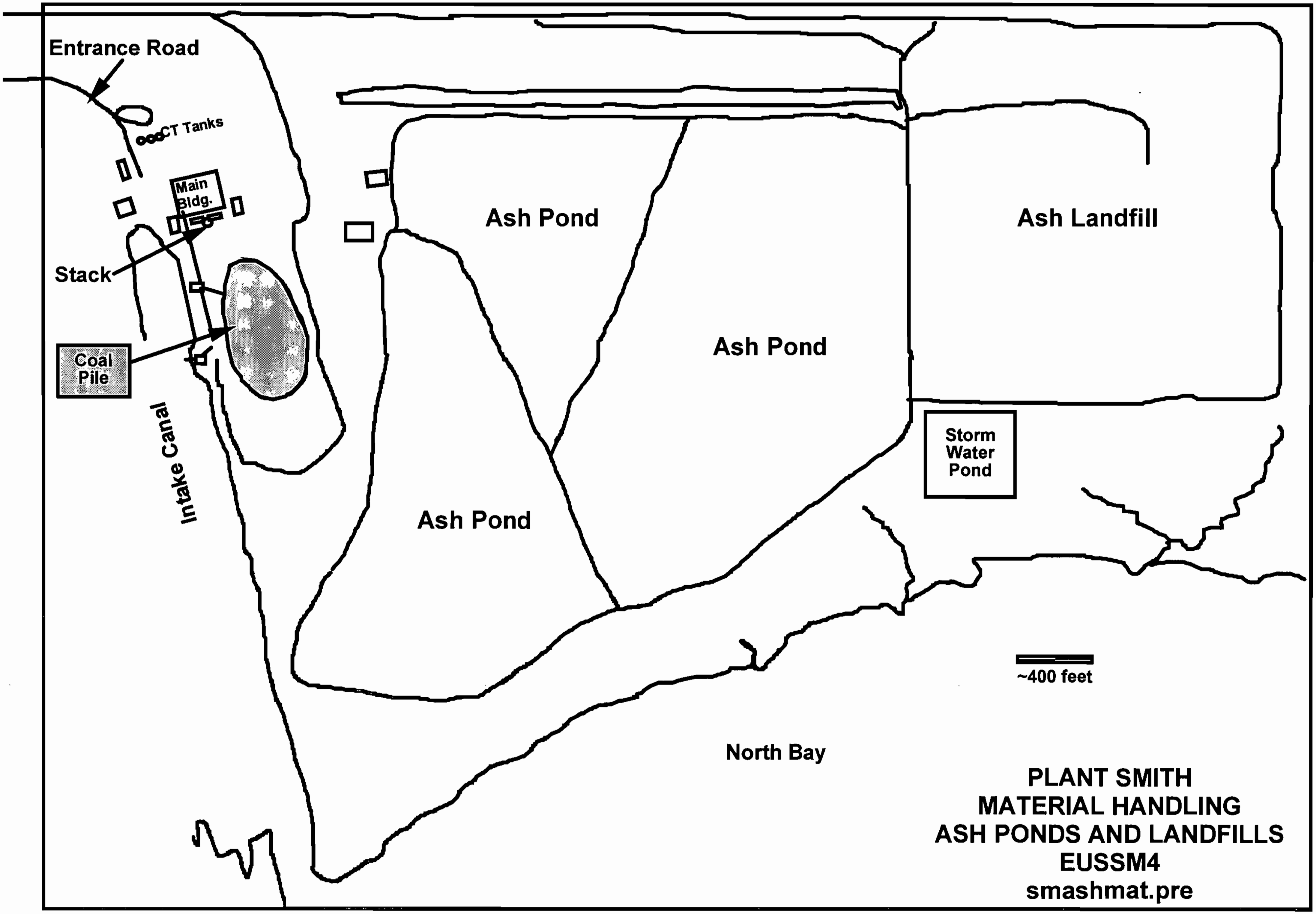
Plant Smith
MATERIALS HANDLING
FLOW DIAGRAM
EUSSM4
smmathdl.pre



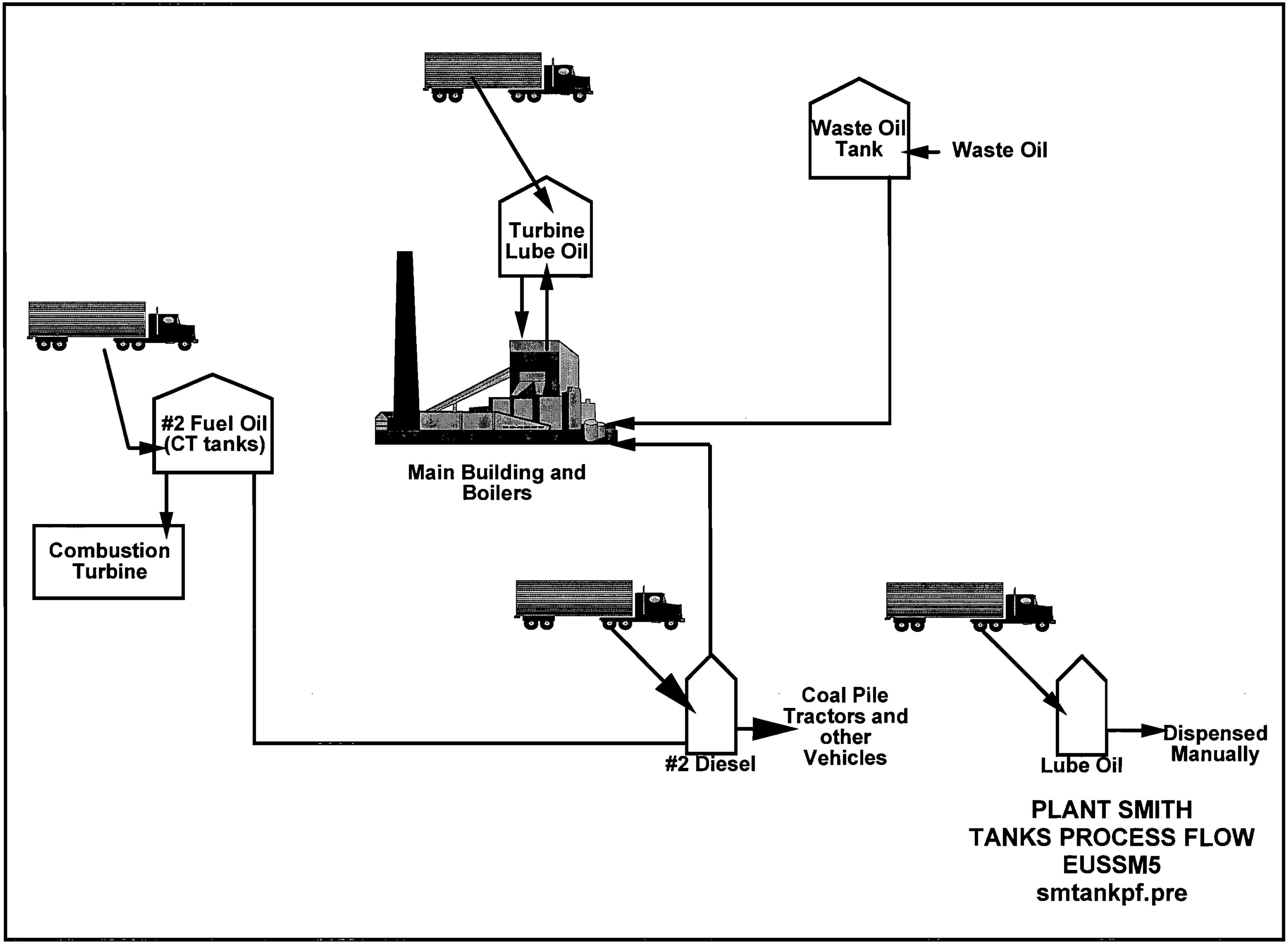
PLANT SMITH
MATERIAL HANDLING
COAL PILE AND CONVEYORS
EUSSM4
(not to scale)
smcoal.pre



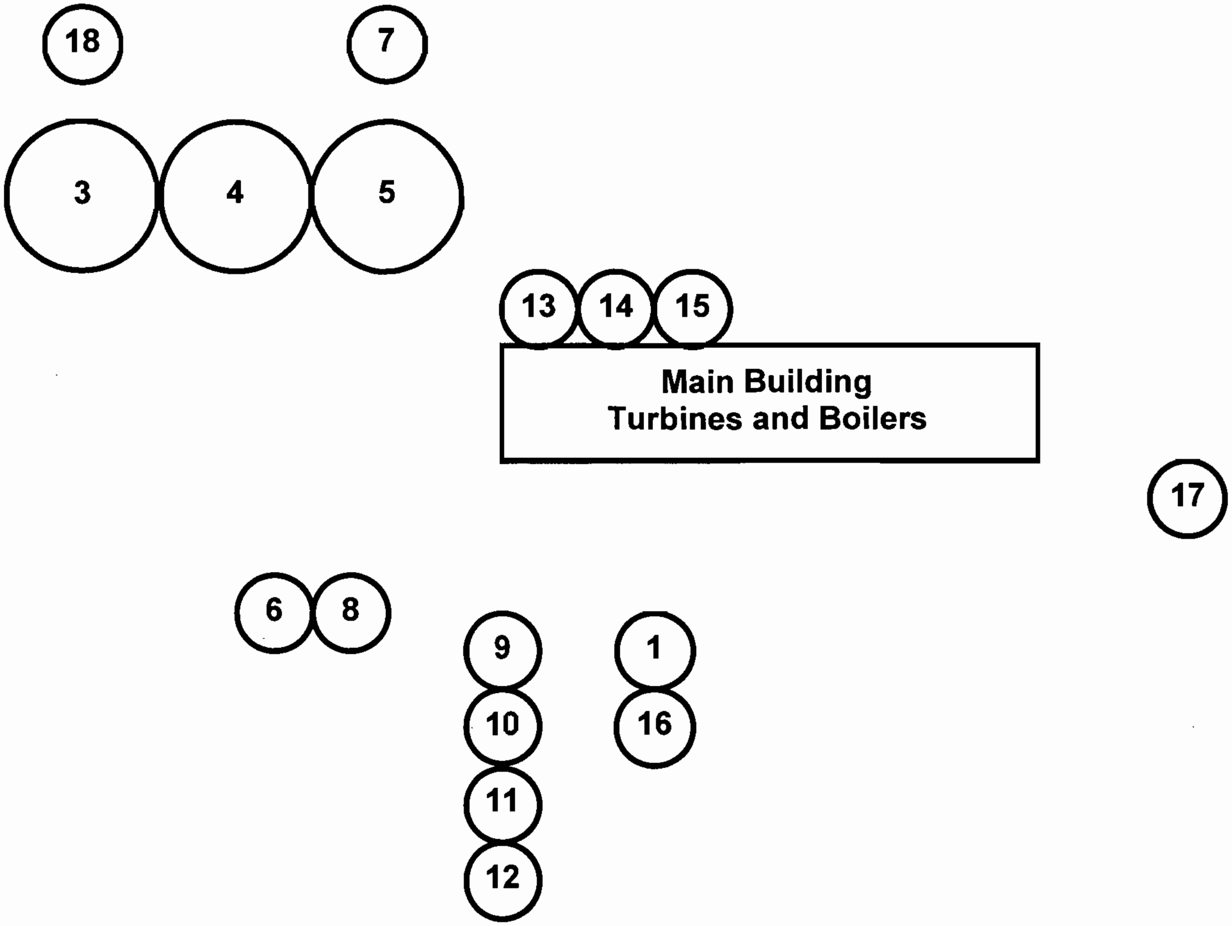
PLANT SMITH
ASH HANDLING
FLOW DIAGRAM
EUSSM4
smash.pre



PLANT SMITH
MATERIAL HANDLING
ASH PONDS AND LANDFILLS
EUSSM4
smashmat.pre



PLANT SMITH
TANKS PROCESS FLOW
EUSSM5
smtankpf.pre



State Registration #	Contents	Size (gallons)
1	#2 diesel - Lighter Oil	25,000
2	Removed Tank	
3	#2 diesel - CT fuel oil	200,000
4	#2 diesel - CT fuel oil	200,000
5	#2 diesel - CT fuel oil	200,000
6	Lube Oil	1,000
7	Used Oil	2,100
8	Lube Oil	581
9	Lube Oil	560
10	Lube Oil	560
11	Lube Oil	560
12	Lube Oil	560
13	Lube Oil	6,000
14	Lube Oil	6,000
15	Lube Oil	6,000
16	Sulfuric Acid	4,000
17	not used	4,000
18	Waste Oil	560

PLANT SMITH
TANKS PLOT PLAN
(not to scale)
EUSSM5
smtanks.pre

EUS-2

E96-009132
E96-009131
E96-009130

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CONSOL Inc.

Projected Typical Quality
1996 for Gulf Power

MINE	Rend Lake Met/Stm	Ohio #11
MOISTURE	12.00	12.00
VM	31.59	37.03
FC	47.94	45.29
ASH	8.48	5.68
SULFUR	0.97	2.82
BTU GROSS	11634	11873
VM (DRY)	35.89	42.08
FC (DRY)	54.47	51.47
ASH (DRY)	9.63	6.45
SUL (DRY)	1.10	3.20
BTU (DRY)	13221	13492
BTU (MAF)	14630	14422
ULTIMATE ANALYSIS (DRY)		
CARBON	75.40	75.53
HYDROGEN	4.95	5.05
NITROGEN	1.72	1.53
OXYGEN (DIF)	8.80	8.15
CHLORINE	0.40	0.09
MINERAL ANALYSIS (ASH BASIS)		
Al2O3	24.40	19.50
SiO2	56.46	43.01
TiO2	1.22	1.09
Fe2O3	9.59	24.96
CaO	1.50	3.60
Na2O	1.50	1.02
MgO	1.10	0.79
K2O	2.65	2.25
P2O5	0.18	0.13
SO3	1.04	2.13
UNDETERMINED (DIF)	0.36	1.52
B/A RATIO	0.20	0.51
FOULING FACTOR, RF (B&W)	0.30	0.52
SLAGGING FACTOR, RS (B&W)	0.22	1.84
LB ASH/MM BTU	1.67	4.78
LB SO2/MM BTU	7.32	4.74
% 1/4" x 0	45.0	50.1
% 28M x 0	7.5	9.4
HGI	56	53
ASH FUSION TEMPERATURES °F		
IDT (RED)	2450	1996
ST H=W (RED)	2547	2024
HT H=1/2 W (RED)	2594	2138
FT (RED)	2676	2257
IDT (OX)	2579	2407
ST H=W (OX)	2631	2471
HT H=1/2 W (OX)	2687	2523
FT (OX)	2721	2557

CONSOL Inc.
Typical Quality

Mine	Rend Lake	Ohio #11
TRACE ELEMENTS (ppm in coal)		
Arsenic (As)	11.04	2 67
Barium (Ba)	30.35	77.23
Beryllium (Be)	1.24	1.68
Cadmium (Cd)	7 08	0.09
Cobalt (Co)	5.01	4.01
Chromium (Cr)	13.01	13.23
Copper (Cu)	7.47	6.46
Fluorine (F)	59.27	150.53
Mercury (Hg)	0.08	0.07
Lithium (Li)	13.66	4.04
Manganese (Mn)	14.27	16.45
Molybdenum (Mo)	1.73	14.33
Nickel (Ni)	15.62	13.25
Lead (Pb)	15.62	4.76
Antimony (Sb)	1.02	0.17
Selenium (Se)	1.67	1.44
Tin (Sn)	0.60	0.46
Thorium (Th)	1.79	1.33
Thallium (Tl)	0.27	0.83
Uranium (U)	0.69	3.13
Vanadium (V)	19.32	25.10
Zinc (Zn)	29.99	13.25

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To Larry Webb	From P. Lavallet
Co. Gulf Power	Co. SCS
Dept. Fuel	Phone # 205 870-6604
Fax # 8420-6217	Fax # (205) 802-0410

Technical Marketing Services

07-May-96

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E96-009133
E95-009330

OLD BEN – FRAN..N CO.
TYPICAL QUALITY SPECS.
MINE ANALYSIS

PROXIMATE ANALYSIS, % AS RECEIVED

MOISTURE	12.00
ASH	9.00
SULFUR	2.50
VOLATILE MATTER	34.00
FIXED CARBON	45.00
BTU	11700

2

ULTIMATE ANALYSIS, % DRY BASIS

CARBON	73.40
HYDROGEN	5.10
NITROGEN	1.55
CHLORINE	0.36
SULFUR	2.84
ASH	10.23
OXYGEN, BY DIFF.	6.52

ASH MINERAL ANALYSIS, % IGN. BASIS

SILICON DIOXIDE	48.22
ALUMINUM OXIDE	21.08
TITANIUM DIOXIDE	1.18
CALCIUM OXIDE	4.44
POTASSIUM OXIDE	2.18
MAGNESIUM OXIDE	0.97
SODIUM OXIDE	1.35
FERRIC OXIDE	16.45
PHOSPHORUS PENTOXIDE	0.27
SULFUR TRIOXIDE	3.70
UNDETERMINED	0.16

FORMS OF SULFUR, % DRY BASIS

PYRITIC	1.28
SULFATE	0.02
ORGANIC	1.54
TOTAL	2.84

ASH FUSION TEMP'S, REDUCING, FAH.

INITIAL DEFORMATION	2050
SOFTENING	2100
HEMISPHERICAL	2140
FLUID	2300

HARDGROVE INDEX	53

E 96 009134

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • TEL: 708-953-9300 FAX: 708-953-9306
.CE 1908
Member of the SGS Group (Société Générale de Surveillance)

February 18, 1994

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 752, HENDERSON, KY 42420
TEL: (502) 827-1187
FAX: (502) 826-0719

PITTSBURG & MIDWAY COAL MINING
SEBREE MINE
P. O. BOX 608
SEBREE KY 42455

Sample identification by
C. T. & E. CO.

Composite of 4 Barges
Barge #C 867, C 640, C 777, C 791
Tons: 5987.0*

*Tonnage supplied by client

Kind of sample reported to us: Coal

Sample taken at: Sebree Dock

Sample taken by: Mechanical Sampler

Date sampled: February 1, 1994

Date received: February 1, 1994

Analysis Report No. 63-47537

ANALYSIS OF ASH	WEIGHT %, IGNITED BASIS
Silicon dioxide	47.01
Aluminum oxide	19.71
Titanium dioxide	0.98
Iron oxide	20.34
Calcium oxide	3.70
Magnesium oxide	0.97
Potassium oxide	2.45
Sodium oxide	0.70
Sulfur trioxide	3.80
Phosphorus pentoxide	0.14
Strontium oxide	0.03
Barium oxide	0.07
Manganese oxide	0.10
Undetermined	0.00
	100.00

Silica Value = 65.27
Base:Acid Ratio = 0.42
T_{250} Temperature = 2391 °F

Type of Ash = BITUMINOUS
Fouling Index = 0.29
Slagging Index = 1.36

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Henderson Laboratory

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COMMERCIAL TESTING & ENGINEERING CO.
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SINCE 1908
Member of the SGS Group (Société Générale de Surveillance)

February 18, 1994

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P&M COAL MARKETING DEPT.

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 752, HENDERSON, KY 42420
TEL: (502) 827-1187
FAX: (502) 826-0719

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Date received: February 1, 1994

Analysis Report No. 63-47537

PROXIMATE ANALYSIS	As Received	Dry Basis
% Moisture	9.22	xxxxx
% Ash	10.16	11.19
% Volatile	35.81	39.45
% Fixed Carbon	44.81	49.36
	100.00	100.00
Btu/lb	11848	13051
% Sulfur	2.93	3.23
MAF Btu		14695
Alk. as Sodium Oxide	0.23	0.26

ULTIMATE ANALYSIS	As Received	Dry Basis
% Moisture	9.22	xxxxx
% Carbon	65.76	72.44
% Hydrogen	4.72	5.20
% Nitrogen	1.26	1.39
% Sulfur	2.93	3.23
% Ash	10.16	11.19
% Oxygen(diff)	5.95	6.55
	100.00	100.00
% Chlorine	0.07	0.08

FORMS OF SULFUR		
% Pyritic	1.28	1.41
% Sulfate	0.01	0.01
% Organic(diff)	1.64	1.81
WATER SOLUBLE ALK.		
% Sodium oxide	0.019	0.021
Potassium oxide	0.005	0.005

FUSION TEMPERATURE OF ASH, (°F)	Reducing	Oxidizing
Initial Deformation (IT)	1950	2380
Softening (ST)	2070	2450
Hemispherical (HT)	2140	2490
Fluid (FT)	2250	2560

INDABILITY INDEX = 56 at 2.61 % Moisture
% EQUILIBRIUM MOISTURE = 5.1
FREE SWELLING INDEX = 6.0

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Henderson Laboratory

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES INC.

COMMERCIAL TESTING & ENGINEERING CO.
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1908
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PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 752, HENDERSON, KY 42420
TEL: (502) 827-1187
FAX: (502) 826-0719

May 3, 1994

PITTSBURG & MIDWAY COAL MINING
P.O. BOX 6518
ENGLEWOOD CO 80111

Sample identification by
C.T. & E. CO.

March 1994 Composite
LG&E Shipments

Kind of sample reported to us: Coal

Sample taken at: Sebree Dock

Sample taken by: Mechanical Sampler

Date sampled: ------

Date received: March 30, 1994

Analysis report no. 63-51435

Material: Coal

Procedure: The samples were prepared according to ASTM, Part 05.05, Method D3683. The samples were analyzed for trace elememts by Inductively Coupled Plasma Emission Spectroscopy.

Arsenic, Selenium, Tin, and Antimony are determined by graphite furnace atomic absorption.

Mercury was determined by Double Gold Amalgamation Cold Vapor Atomic Absorption.

Results: Results are reported as micrograms per gram (ug/g), on a dry basis.

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Henderson Laboratory

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES, INC.

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E-96-007134

COMMERCIAL TESTING & ENGINEERING CO.

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Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 752, HENDERSON, KY 42420
TEL: (502) 827-1187
FAX: (502) 826-0719

May 3, 1994

PITTSBURG & MIDWAY COAL MINING
P.O. BOX 6518
ENGLEWOOD CO 80111

Sample identification by
C.T. & E. CO.

March 1994 Composite
LG&E Shipments

Kind of sample reported to us: Coal

Sample taken at: Sebree Dock

Sample taken by: Mechanical Sampler

Date sampled: ------

Date received: March 30, 1994

Analysis report no. 63-51435

TRACE ANALYSIS

Parameter	ug/g, dry coal basis
Antimony, Sb	2
Arsenic, As	6
Barium, Ba	42
Beryllium, Be	1.3
Cadmium, Cd	<0.3
Chromium, Cr	18
Cobalt, Co	3
Copper, Cu	7
Lead, Pb	12
Lithium, Li	9
Manganese, Mg	7
Mercury, Hg	0.19
Molybdenum, Mo	<3
Nickel, Ni	12
Selenium, Se	2
Silver, Ag	<0.3
Strontium, Sr	34
Tin, Sn	<1
Vanadium, V	74
Zinc, Zn	76
Zirconium, Zr	19

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Henderson Laboratory

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES INC.

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

165A/063/94

Evs-3

ELECTROSTATIC PRECIPITATORS

1. Emissions Point No. / Name: **Plant Smith Unit 1**

2. Manufacturers Name and Model No.: **Buell**

3. Date of construction for existing sources or date of anticipated start-up for new sources: **Placed in service in Janurary 1977**

4. Precipitator Data:

a) Precipitator Type:

__X___ Single Stage _____ Low Voltage __X__ Hot Side
_____ Two Stage __X__ High Voltage _____ Cold Side
_____ Other:____________________

b) Efficiency: **99.1**

c) Flow rate: **853,000 acfm**

d) Pressure drop:

e) Inlet temperture: **655 degrees**

f) Total collection plate area: **300,256 ft2**

g) No. of compartments: **1**

h) No. of electrically separate fields: **5**

i) Fan is: ______ Upstream ___X___Downstream

j) Cleaning Method:

__X___ Plate Rapping
__X__ Plate Vibrating
______ None
______ Washing
______ Other: ____________________

k) Gas velocity thru precipitator: **4.7 ft/sec**

5. Which process or processes does the electrostatic percipitator control emissions from? Pulverized coal fired steam generator (Tangential fired)

ELECTROSTATIC PRECIPITATORS

1. Emissions Point No. / Name: **Plant Smith Unit 1**

2. Manufacturers Name and Model No.: **GE ESI**

3. Date of construction for existing sources or date of anticipated start-up for new sources: **Placed in service in june 1965**

4. Precipitator Data:

a) Precipitator Type:

__X__ Single Stage _____ Low Voltage _____ Hot Side
_____ Two Stage __X__ High Voltage __X__ Cold Side
_____ Other:_____________________________

b) Efficiency: **98**

c) Flow rate: **460,000 acfm**

d) Pressure drop:

e) Inlet temperture: **276 degrees**

f) Total collection plate area: **33,120 ft2**

g) No. of compartments: **1**

h) No. of electrically separate fields: **4**

i) Fan is: ______ Upstream ____X___Downstream

j) Cleaning Method:

__X__ Plate Rapping
__X__ Plate Vibrating
______ None
______ Washing
______ Other: ____________________________

k) Gas velocity thru precipitator: **5.69 ft/sec**

5. Which process or processes does the electrostatic percipitator control emissions from? **Pulverized coal fired steam generator (Tangential fired)**

ELECTROSTATIC PRECIPITATORS

1. Emissions Point No. / Name: **Plant Smith Unit 2**

2. Manufacturers Name and Model No.: **Buell**

3. Date of construction for existing sources or date of anticipated start-up for new sources: **Placed in service in Feburary 1977**

4. Precipitator Data:

a) Precipitator Type:

__X__ Single Stage   _____ Low Voltage   __X__ Hot Side
_____ Two Stage   __X__ High Voltage   _____ Cold Side
_____ Other: ____________________

b) Efficiency: **99.1**

c) Flow rate: **1,100,000 acfm**

d) Pressure drop:

e) Inlet temperture: **670 degrees**

f) Total collection plate area: **311,300 ft2**

g) No. of compartments: **1**

h) No. of electrically separate fields: **5**

i) Fan is: ______ Upstream   __X__ Downstream

j) Cleaning Method:

__X__ Plate Rapping
__X__ Plate Vibrating
______ None
______ Washing
______ Other: ____________________

k) Gas velocity thru precipitator: **4.72 ft/sec**

5. Which process or processes does the electrostatic percipitator control emissions from? **Pulverized coal fired steam generator (Tangential fired)**

ELECTROSTATIC PRECIPITATORS

1. Emissions Point No. / Name: **Plant Smith Unit 2**

2. Manufacturers Name and Model No.: **GE ESI**

3. Date of construction for existing sources or date of anticipated start-up for new sources: **Placed in service in June 1967**

4. Precipitator Data:

a) Precipitator Type:

__X___ Single Stage _____ Low Voltage _____ Hot Side
_____ Two Stage __X___ High Voltage __X__ Cold Side
_____ Other:____

b) Efficiency: **98**

c) Flow rate: **540,000 acfm**

d) Pressure drop:

e) Inlet temperture: **280 degrees**

f) Total collection plate area: **37260 ft2**

g) No. of compartments: **1**

h) No. of electrically separate fields: **3**

i) Fan is: ______ Upstream ____X___Downstream

j) Cleaning Method:

__X___ Plate Rapping
__X_ Plate Vibrating
______ None
______ Washing
______ Other: ______________________________

k) Gas velocity thru precipitator: **6.25 ft/sec**

5. Which process or processes does the electrostatic percipitator control emissions from? **Pulverized coal fired steam generator (Tangential Fired)**

E.US-4

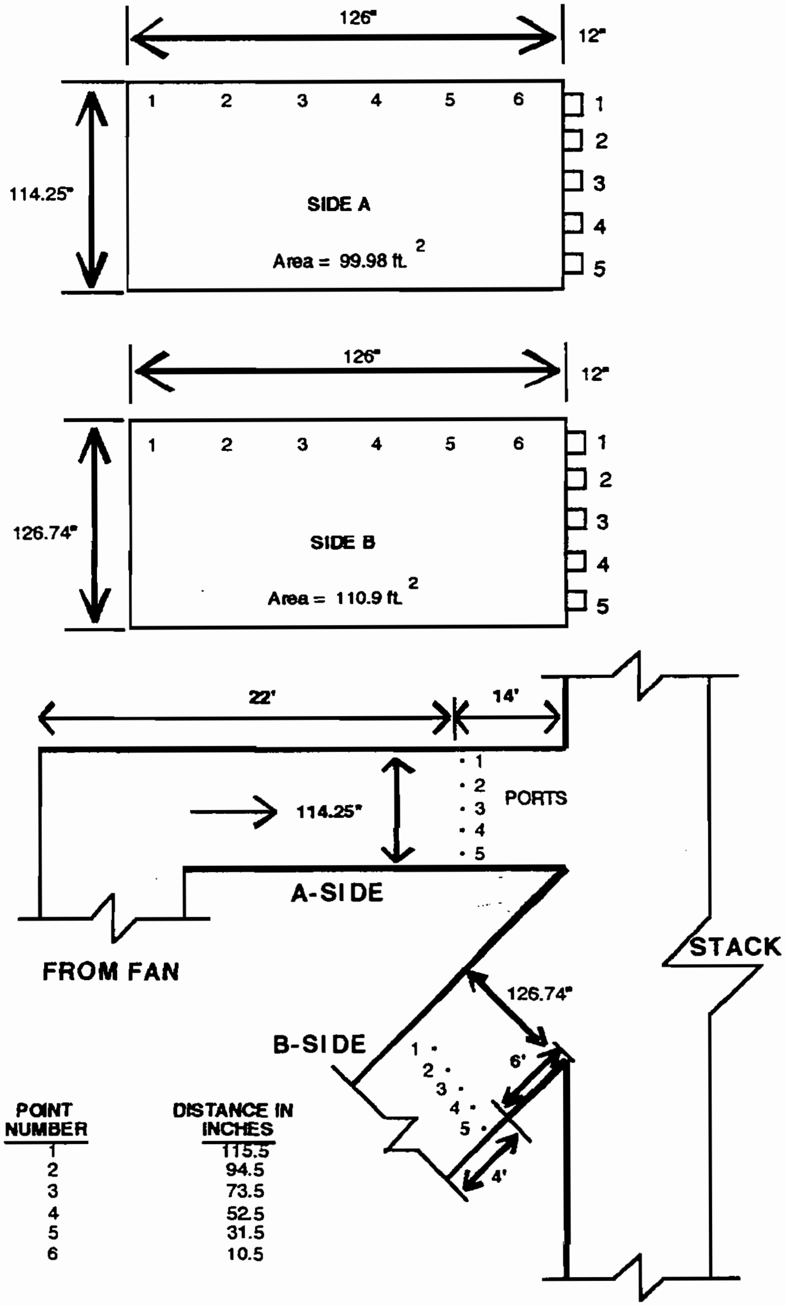
Plant Smith

Unit 1

4. SAMPLE POINT LOCATION

The sample point locations and outlet duct schematic are presented in Figure 2. Method 1 was used for determination of the number and location of sampling points. The minimum number of points (25) required for rectangular stacks was met by sampling a total of 60 points.

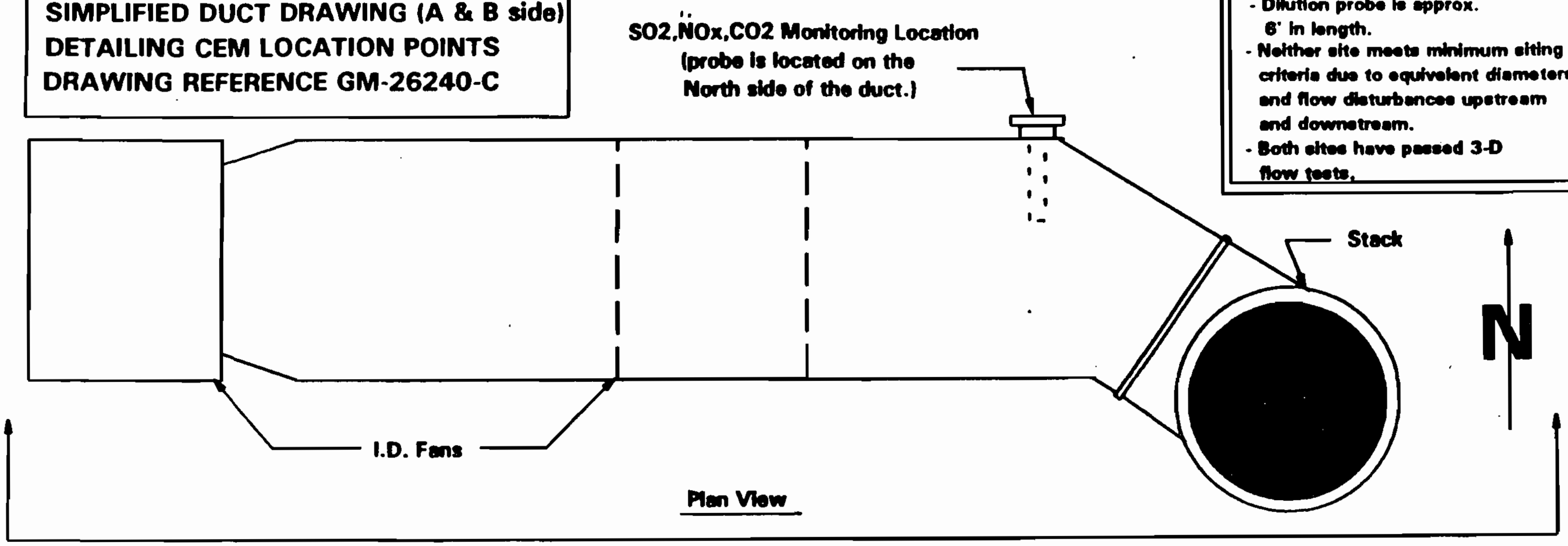
Figure 2. Sample Point Locations



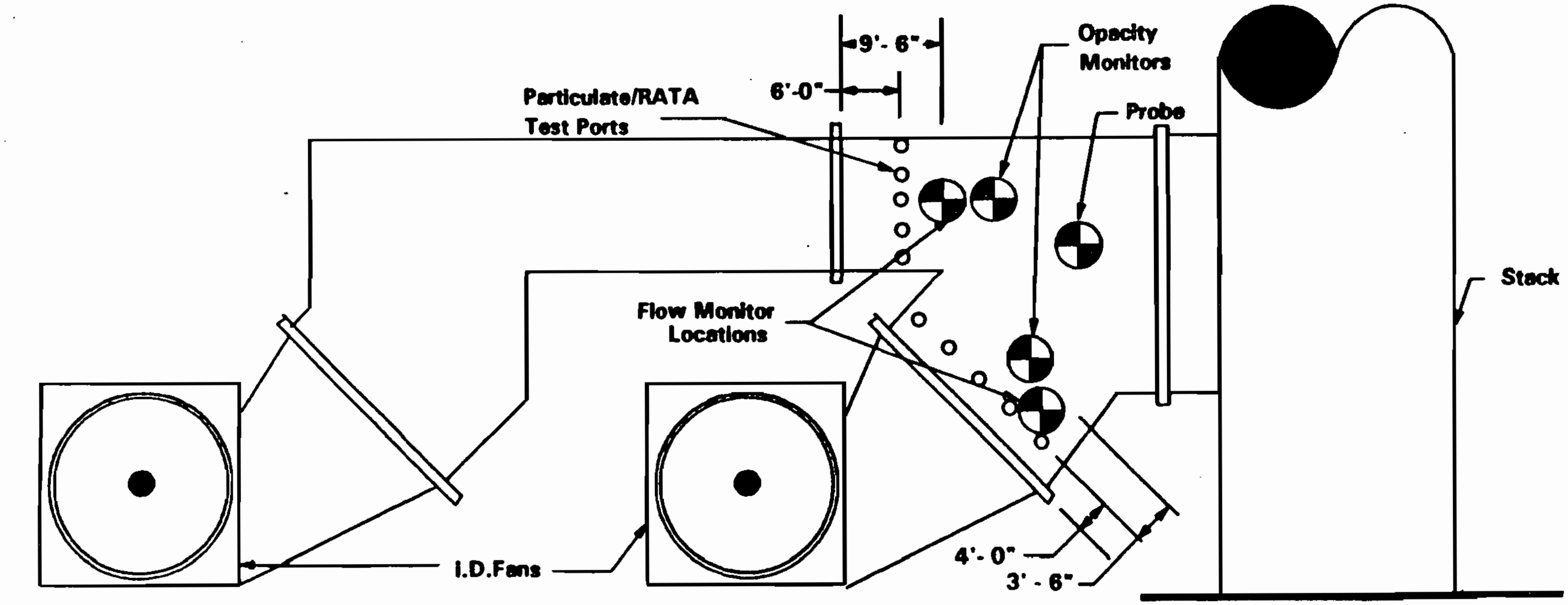
POINT NUMBER	DISTANCE IN INCHES
1	115.5
2	94.5
3	73.5
4	52.5
5	31.5
6	10.5

PLANT SMITH UNIT 1 ORIS CODE 643
SIMPLIFIED DUCT DRAWING (A & B side)
DETAILING CEM LOCATION POINTS
DRAWING REFERENCE GM-26240-C

NOTES:
- Duct dimensions are 114"x126".
- Stack diameter is 18'-0".
- Dilution probe is approx. 6' in length.
- Neither site meets minimum siting criteria due to equivalent diameters and flow disturbances upstream and downstream.
- Both sites have passed 3-D flow tests.



Plan View



NOTE:DRAWING NOT TO SCALE.

Side View

EVS-5

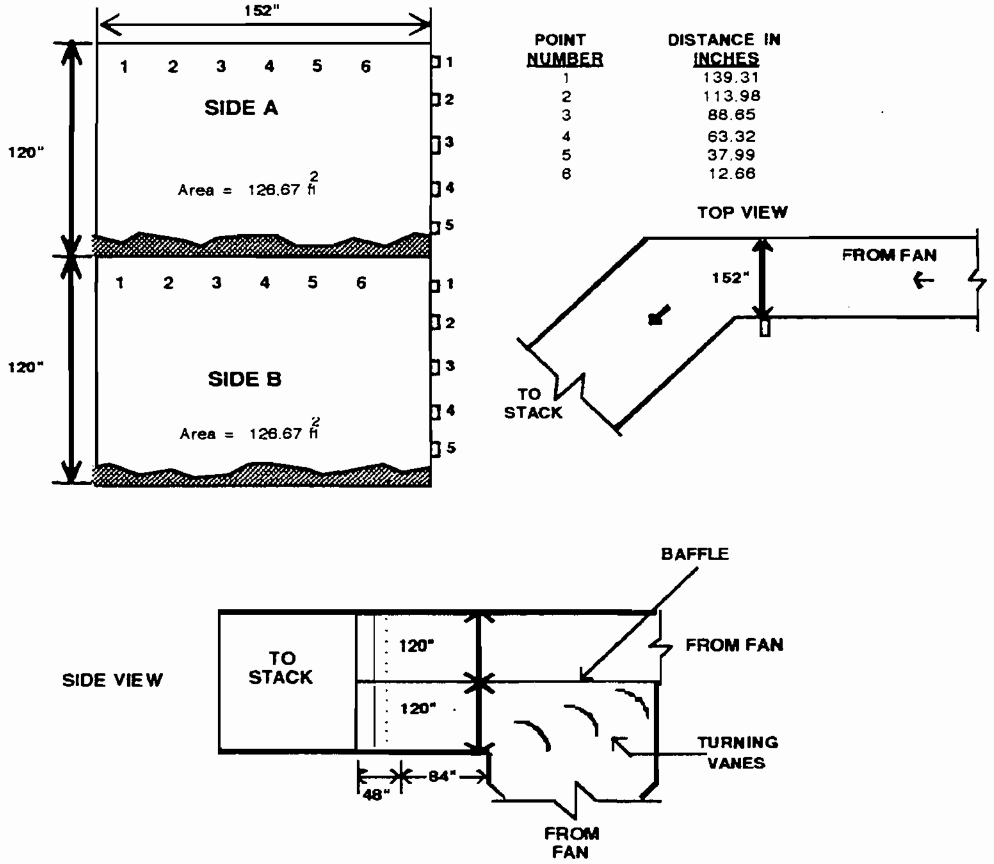
Plant Smith

Unit 2

4. SAMPLE POINT LOCATION

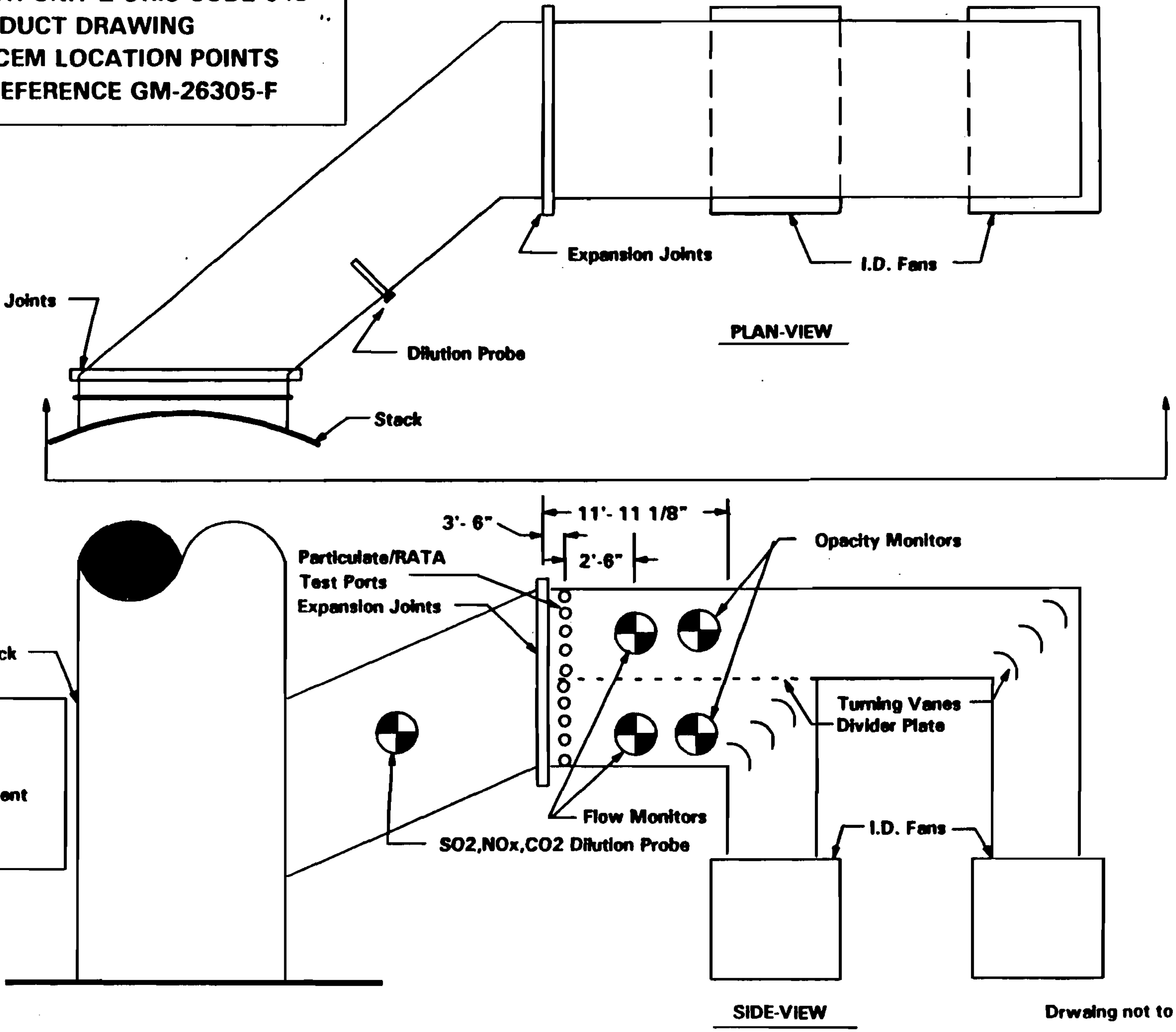
The sample point locations and outlet duct schematic are presented in Figure 2. Method 1 was used for determination of the number and location of sampling points. The minimum number of points (25) required for rectangular stacks was met by sampling a total of 60 points.

Figure 2. Sample Point Locations



POINT NUMBER	DISTANCE IN INCHES
1	139.31
2	113.98
3	88.65
4	63.32
5	37.99
6	12.66

PLANT SMITH UNIT 2 ORIS CODE 643
SIMPLIFIED DUCT DRAWING
DETAILING CEM LOCATION POINTS
DRAWING REFERENCE GM-26305-F

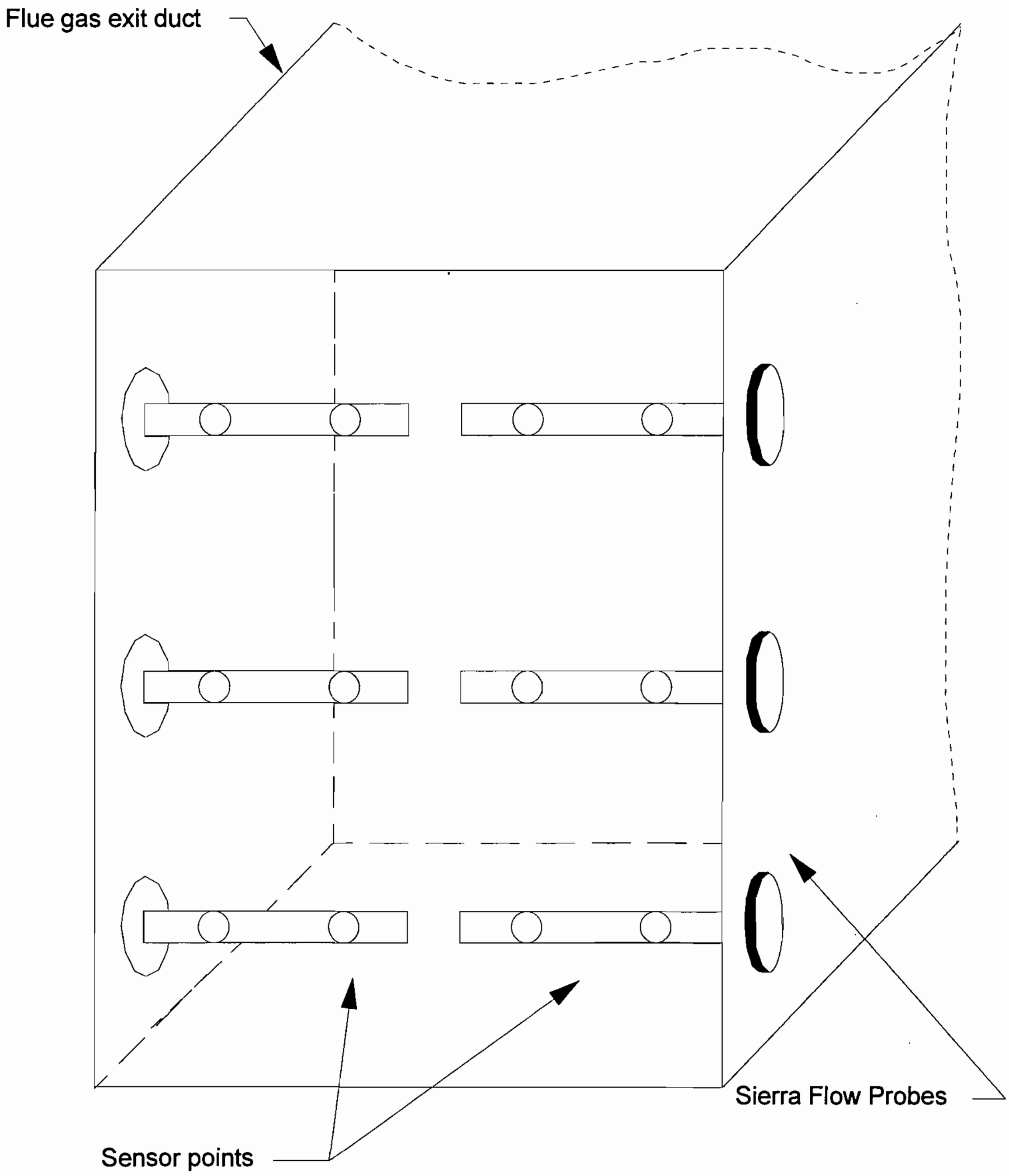


NOTES:

- Stack diameter is 18' 0".
- Duct area at the point of opacity and flow measurement is 152" x 120.5.
- Probe length is approx. 6'.

Drwaing not to scale

GULF POWER COMPANY
PLANT SMITH ORIS 643
FLOW MONITOR PROBE CONFIGURATION DIAGRAM
UNITS 1a & 2a, 2b



Note: Duct area at the point of measurement is 127.19 Sq. Ft. for Unit 2
and 126 Sq. Ft. for Unit 1.

Note: Drawing not to scale.

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.

PARTICULATE EMISSIONS TEST REPORT
STEADY STATE OPERATIONS

FOR

GULF POWER COMPANY
Plant Smith, Unit 1
Panama City, Florida

May 8, 1996

1568 LEROY STEVENS ROAD
MOBILE, ALABAMA 36695 • 205/633-4120

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ILLUSTRATIONS

1. INTRODUCTION

Sanders Engineering & Analytical Services, Inc. (SEAS), performed particulate emissions testing at Gulf Power Company, Plant Smith, Unit 1, located in Panama City, Florida. The test was conducted on May 8, 1996, during steady state operations. The testing was performed in accordance with the applicable U.S. EPA procedures specified at **40 CFR, Part 60, Appendix A, Methods 1, 2, 3, 4, and 17**.

The purpose of the test was to demonstrate compliance with the rules and regulations of the Florida Department of Environmental Protection, and to meet certain requirements contained in the permit to operate issued by the Florida Department of Environmental Protection.

The test was conducted by Mr. Jack Covington, Mr. Dean Holmes, Mr. John Holcombe, and Mr. John Wilson of Sanders Engineering & Analytical Services, Inc., and was coordinated with Mr. John McPherson of Gulf Power Company. The Florida Department of Environmental Protection was notified so that a representative could be present to observe the testing.

The test was conducted in accordance with the rules and regulations of the Florida Department of Environmental Protection. Further discussion of the test methods are included later in the report.

2. SUMMARY AND DISCUSSION OF RESULTS

The results of the particulate emissions testing for the steady state runs, along with the results of the computations, are summarized in Table I. The equations used in the calculation of the results, along with the completed field data sheets, are presented in Appendix A. The sample calculations of the first run are presented in Appendix B. The quality control checks of the equipment used in the sampling program are included in Appendix C.

There were no problems encountered during the performance of the test. The bottom port of side A duct was not sampled due to ash build-up in the duct. One of the other ports was alternately sampled twice on each run to compensate for the port not sampled. At the completion of each run, the filter and probe were removed to a relatively clean, draft-free area for clean-up.

The results of the testing indicate the particulate emission rate during steady state for Plant Smith, Unit 1, is 0.017 LBS/MMBTU. The applicable Florida Department of Environmental Protection rules and regulations require an emission rate of no greater than 0.10 LBS/MMBTU. The results of the testing indicate that the unit is in compliance with the particulate emission condition of the permit to operate issued by the Florida Department of Environmental Protection.

TABLE I. PARTICULATE EMISSIONS TEST RESULTS

GULF POWER COMPANY
PLANT SMITH, UNIT 1, STEADY STATE
5/8/96

Title of Run		RUN 1	RUN 2	RUN 3
Sampling Time -Start	Military	0712	1038	1402
Sampling Time -Stop	Military	0934	1247	1609
F Factor	SDCF/MMBTU	9820	9820	9820
Plant Load	Megawatts	175.0	175.0	175.0
Static Pressure	In. H2O	1.25	1.25	1.25
Barometric Pressure	In. Hg	30.31	30.31	30.31
Average dH	In. H20	1.07	1.46	1.56
Meter correction		1.038	1.038	1.038
Avg. Meter Temp.	Deg. F	79.9	86.9	88.9
% O2	%	7.2	7.3	7.3
%CO2	%	12.0	12.0	12.0
Volume Metered	ACF	64.800	75.700	77.942
Volume Water	Ml	116.5	147.0	161.0
Sampling Time	Minutes	120	120	120
Nozzle Diameter	Inches	0.219	0.234	0.243
Avg. Stack Temp.	Deg. F	315.6	321.8	321.4
Area of Stack	Sq. Feet	210.8800	210.8800	210.8800
Wt. of Part.	Mg.	48.8	31.2	29.1
Number of Points		60	60	60
Avg. Sqrt dP	In. H20	0.8357	0.8547	0.8189

RESULTS OF COMPUTATIONS

		RUN 1	RUN 2	RUN 3	Average
Volume of Gas Sampled	SDCF	66.784	77.094	79.102	
H2O vapor in Gas Stream	PERCENT	7.6	8.2	8.7	8.2
Avg. Stack Gas Velocity	FT/SEC	56.0	57.6	55.2	56.3
Volumetric Flow Rate	SDCFM	453,093	458,891	437,790	449,925
Volumetric Flow Rate	ACF/M	708,770	728,703	698,713	712,062
Particulate Conc.	Grs/SDCF	0.011	0.006	0.006	0.008
Particulate Conc.	Grs/ACF	0.007	0.004	0.004	0.005
Particulate Mass Rate	Lb/Hr	43.7	24.5	21.3	29.8
Particulate Mass Rate	Lb/MMBtu	0.024	0.013	0.012	0.017
Heat Input	MMBTU/Hr	1814.69	1824.49	1740.60	1793.26
Percent of Isokinetic	%	99.1	98.9	98.6	

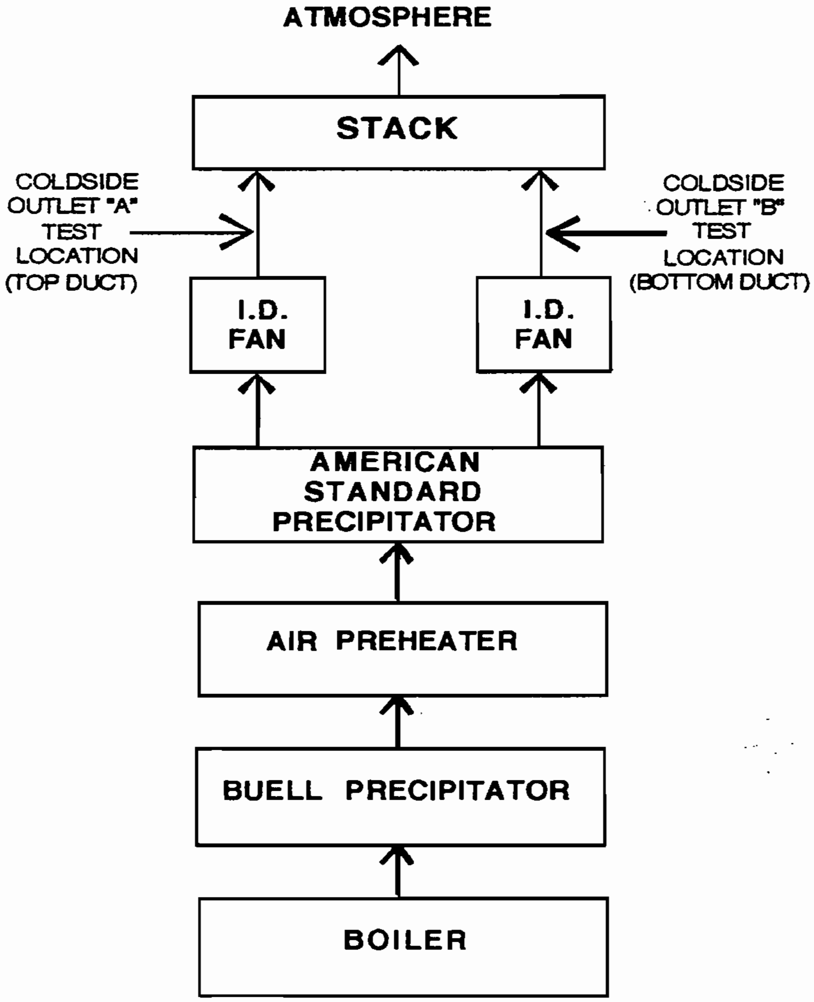
3. PROCESS DESCRIPTION

The process consists of a steam electric generating unit firing bituminous coal for the production of electric energy. The coal is received by either rail, truck, or barge, and loaded directly onto the conveyor feeding the plant, or onto the stockpile and later loaded onto the conveyor belt transporting the coal to the plant. The coal from the conveyor is loaded into bunkers capable of holding between 24 to 36 hours supply of coal. The coal is then fed to pulverizing mills before being fired in the unit through the burners. Upon combustion of the coal in the fire box, approximately 20 percent of the ash falls to the bottom of the boiler and is removed by the ash removal system. The remaining 80 percent exits with the flue gases through the heat exchange and economizer sections of the furnace, and is collected by electrostatic precipitators.

3.1. Source Air Flow

The air flow schematic which depicts the passage of the flue gases exhausted from Plant Smith, Unit 1, is presented in Figure 1.

Figure 1. Air Flow Schematic



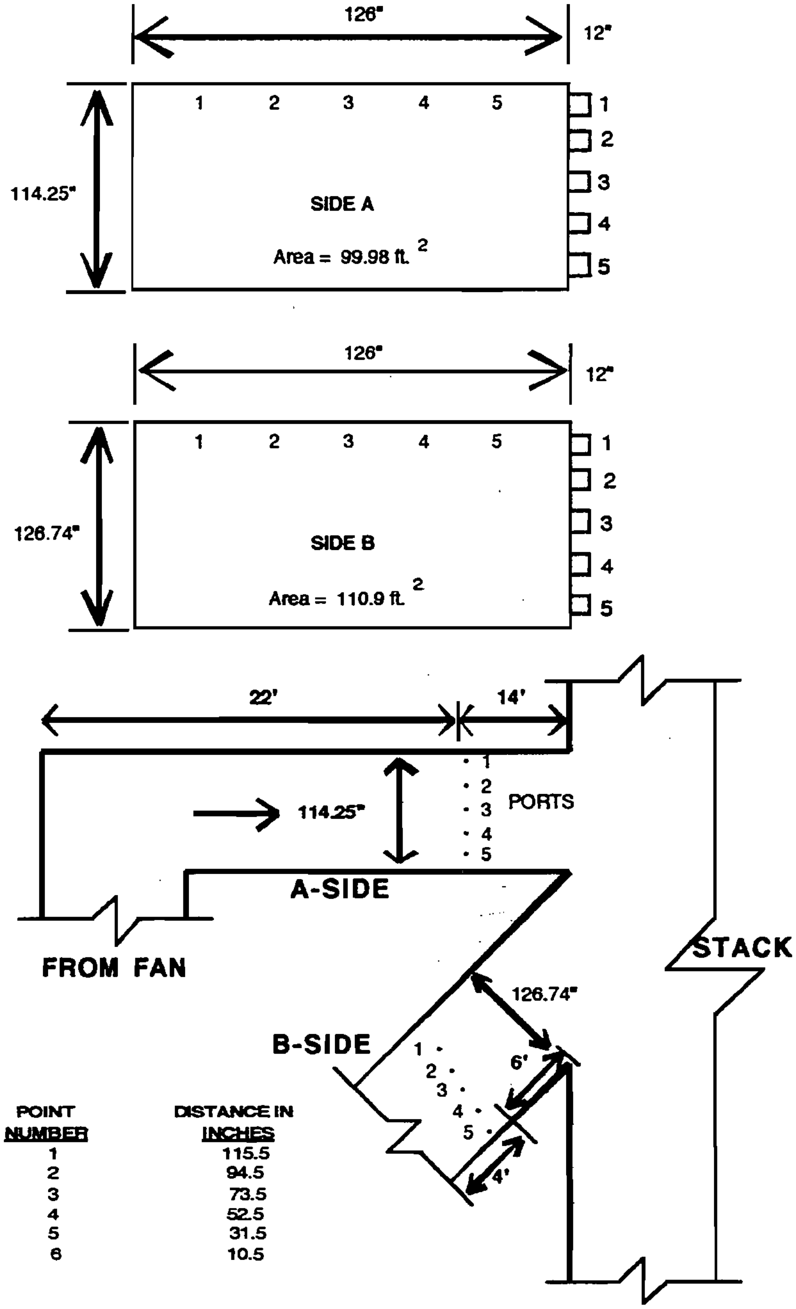
3.2. Operation During Testing

The approximate heat input average during steady state operation, as based on F-factor calculations, is 1793.26 million BTU per hour, resulting in the production of approximately 175 megawatts of electricity. Precipitator data supplied by Gulf Power personnel is given in Appendix D.

4. SAMPLE POINT LOCATION

The sample point locations and outlet duct schematic are presented in Figure 2. Method 1 was used for determination of the number and location of sampling points. The minimum number of points (25) required for rectangular stacks was met by sampling a total of 60 points.

Figure 2. Sample Point Locations



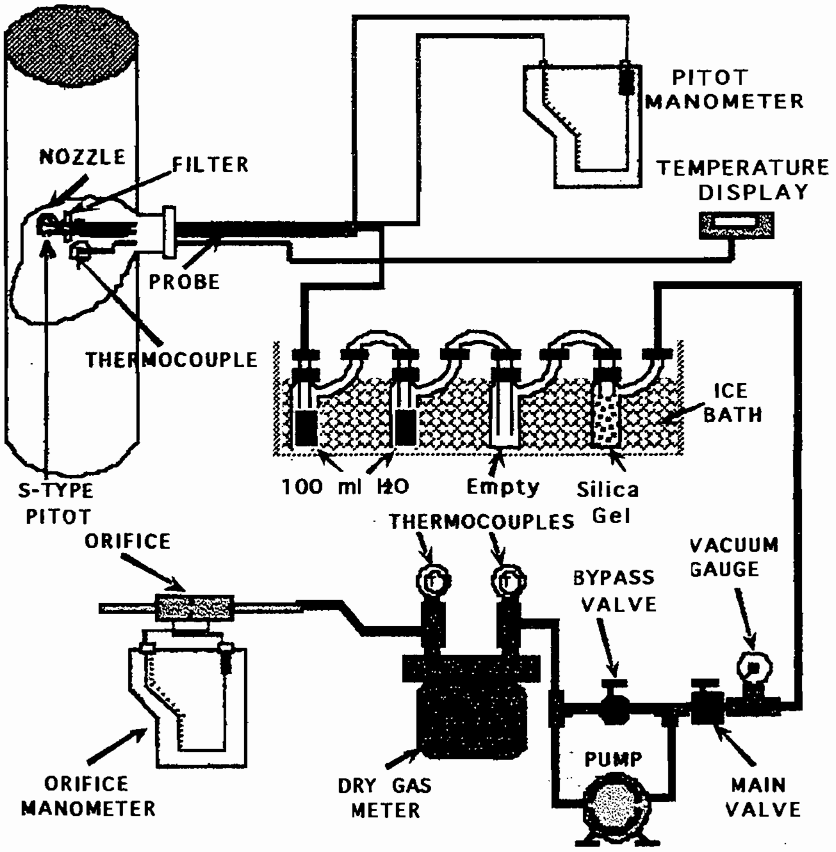
POINT NUMBER	DISTANCE IN INCHES
1	115.5
2	94.5
3	73.5
4	52.5
5	31.5
6	10.5

5. PARTICULATE SAMPLING PROCEDURE (EPA Method 17)

The sampling procedure utilized is that specified in **40 CFR, Part 60, Appendix A, Method 17**. A brief description of this procedure is as follows:

The first impingers were partially filled with 100 milliliters of deionized water. The next impinger was left empty to act as a moisture trap. Preweighed 6 to 16 mesh indication silica gel was added to the last impinger. The sampling equipment manufactured by Lear Siegler (Model 100) or Sanders Engineering (Model 200) was assembled as shown in the attached drawing. The system was leak checked by plugging the inlet to the nozzle and pulling a 15 inch mercury vacuum. A leakage rate not in excess of 0.02 cubic feet per minute was considered acceptable.

Figure 3. Particulate Sampling Train



The inside dimensions of the stack liner were measured and recorded. The required number of sampling points were marked on the probe for easy visibility. The range of velocity pressure, the percent moisture, and the temperature of the effluent

gases were determined. From this data, the correct nozzle size and the nomograph multiplication factor were determined.

Crushed ice was placed around the impingers. The nozzle was placed on the first traverse point with the tip pointing directly into the gas stream. The pump was started immediately and the flow was adjusted to isokinetic sampling conditions. After the required time interval had elapsed, the probe was repositioned to the next traverse point and isokinetic sampling was re-established. This was performed for each point until the run was completed. Readings were taken at each point and recorded on the field data sheet. At the conclusion of each run, the pump was turned off and the final readings were recorded.

5.1. Particulate Sample Recovery

Care was exercised in moving the collection train to the sample recovery area to minimize the loss of collected sample, or the gain of extraneous particulate matter. The volume of water in the impingers was measured, the silica gel impinger was weighed and recorded on the field data sheet. The nozzle, and all sample-exposed surfaces were washed with reagent grade acetone into a clean sample container. A brush was used to loosen any adhering particulate matter and subsequent washings were placed into the container. The filter was carefully removed from the fritted support and placed in a clean separate sample container. A sample of the acetone used in the washing was saved for a blank laboratory analysis.

5.2. Particulate Analytical Procedures

The filter and any loose particulate matter were transferred from the sample container to a clean, tared weighing dish. The filter was placed in a desiccator for at least 24 hours and then weighed to the nearest 0.1 milligram until a constant weight was obtained. The original weight of the filter was deducted, and the weight gain was recorded to the nearest 0.1 milligram.

The wash solution was transferred to a clean, tared beaker. The solution was evaporated to dryness, desiccated to a constant weight, and the weight gain was recorded to the nearest 0.1 milligram.

APPENDIX A EQUATIONS AND FIELD DATA SHEETS

EQUATIONS

1. $P_s = P_{bar} + \frac{P_g}{13.6}$

2. $P_m = P_{bar} + \frac{\overline{\Delta H}}{13.6}$

3. $V_s = K_p C_p \overline{\sqrt{\Delta P}} \sqrt{\frac{\overline{T_s}}{M_s P_s}}$

4. $V_{m(Std)} = K_1 V_m Y \left[\frac{p_{bar} + \frac{\overline{\Delta H}}{13.6}}{\overline{T_m}} \right]$

5. $V_{w(Std)} = 0.04707 V_{lc}$

6. $B_{ws} = \frac{V_{w(Std)}}{V_{m(Std)} + V_{w(Std)}}$

7. $M_d = 0.44 (\%CO_2) + 0.32 (\%O_2) + 0.28 (\%N_2 + \%CO)$

8. $M_s = M_d(1 - B_{ws}) + 18 (B_{ws})$

9. $EA = \left[\frac{(\%O_2 - 0.5 (\%CO))}{0.264 (\%N_2) - ((\%O_2) - 0.5 (\%CO))} \right] 100$

10. $$Q_a = (V_s)(A_s)(60)$$

11. $$Q_s = Q_a\,(1-B_{ws})\,\frac{(528)}{\overline{T_s}}\,\frac{(P_s)}{29.92}$$

12. $$E_H = \left(\frac{PMR}{H_I}\right)$$

13. $$E = C_d\,F_{O_2}\left(\frac{20.9}{20.9 - \%O_2}\right)$$

14. $$C_s = 0.0154\,\frac{M_n}{V_{m(Std)}}$$

15. $$C_{50} = \frac{21\ C_s}{21 - [(1.5)(\%O_2) - 0.133\,(N_2) - 0.75\,(\%CO)]}$$

16. $$C_{12} = \frac{C_s\ (12)}{\%CO_2}$$

17. $$PMR = (C_s)(Q_s)\,\frac{(60)}{7000}$$

18. $$V_n = \left[(0.002669)(V_{1c}) + \frac{V_m Y}{\overline{T_m}}\left(p_{bar} + \frac{\overline{\Delta H}}{13.6}\right)\right]\frac{\overline{T_s}}{p_s}$$

19. $$I = \frac{100\ V_n}{(60)\ \O\ V_s\ A_n}$$

NOMENCLATURE

A_n = Cross-sectional area of nozzel, ft^2

A_s = Cross sectional area of stack, ft^2

B_{ws} = Wator vapor in the gas stream, proportion by volume (dimensionless)

C_p = Pitot tube coefficient (dimensionless) (0.84)

C_s = Particulate concentration, grains/SDCF

C_d = Particulate concentration, lbs/SDCF

C_{12} = Particulate concentration (C_s adjusted to 12% CO) grains/SDCF

C_{50} = Particulate concentration (C_s adjusted to 50% excess air) grains/SDCF

EA = Excess air, %

E = Emission in lb/mmBTU

E_H = Emission in lb/mmBTU, based on heat input

H_I = Total Heat Input, Million BTU per Hour (MMBTU/hr)

I = Percent of isokinetic sampling

K_1 = 17.64 °R/ inches Hg

K_p = Pitot tube constant,

$$85.49 \text{ ft/sec} \left[\frac{(\text{lb/lb-mole})\ (\text{in. Hg})}{(^\circ\text{R})\ (\text{inc. } H_2O)}\right]^{\frac{1}{2}}$$

M_n = Total amount of particulate collected, mg

M_d = Molecular weight of stack gas; dry basis, lb/lb mole

M_s = Molecular weight of stack gas; wet basis, lb/lb mole

P_{bar} = Barometric pressure at the sampling site, in. Hg

NOMENCLATURE (continued)

P_m = Meter pressure, in. Hg

P_s = Absolute stack pressure, in. Hg

P_g = Stack static pressure, in. H_2O

PMR = Particulate mass rate, lb/Hr

Q_a = Volumetric flow rate ACFM

Q_s = Volumetric flow rate SDCFM

V_s = Average stack gas velocity, ft/sec

V_{lc} = Total volume of liquid collected in impingers & silica gel, ml

V_m = Volume of gas sample as measured by dry gas meter, ACF

$V_{m(std)}$ = Volume of gas sample measured by dry gas meter, corrected to standard conditions, SDCF

$V_{w(std)}$ = Volume of water vapor in gas sample, corrected to standard conditions, SCF

V_n = Volume collected at stack conditions through nozzle, ACF

Y = Dry gas meter calibration factor (dimensionless)

ΔH = Average pressure difference of orifice, in. H_2O

ΔP = Velocity head of stack gas, in. H_2O

$\overline{\sqrt{\Delta P}}$ = Average of square roots of the velocity pressure, in. H_2O

Ø = Total sampling time, minutes

%CO_2, %O_2, N_2, %CO - Number % by volume, dry basis, from gas analysis

F_{O2} = Oxygen based F factor (9820 SDCF/mmBTU for bituminous coal)

T_s = Temperature of the stack, °R (° F + 460)

125 MW Steady State

SANDERS ENGINEERING & ANALYTICAL SERVICES, Inc.

1568 Leroy Stevens Rd.
Mobile, AL 36695

Office: (205) 633-4120
FAX#: (205) 633-2285

FIELD DATA SHEET

COMPANY Gulf Power Co DATE 5-8-96 METER BOX S-100

PLANT/(UNIT) Smith OPERATOR JC ΔHa .25 cu. ft. /min.

LOCATION Unit 1 Steady State METHOD 17 PROBE 12' liner/length

RUN 1 SS

NOMOGRAPH

Km ____ Tm ____
Noz ____ Ts ____
H2O ____ PsPm ____

NOZZLE CALIBRATION

PRE	POST
219	219
219	219
220	219
.219	.219
AVERAGE	AVERAGE

FILTER 1388

METER READING

FINAL	71.200
INITIAL	6.400
NET	64.800

LEAK CHECK

SYSTEM

Pre	Post
✓ in. Hg	22 in. Hg
✓ cfm	.007 cfm

PITOT: Pre ☑ impact ☑ static; Post ☑ impact ☑ static

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	196	100	0	1489.5
INITIAL	100	✓100	0	1469.0
NET	96	0	0	20.5

TOTAL 116.3

GAS ANALYSIS

O_2 7.2

CO_2 12.0

CO ____

STATIC +1.25 in. H_2O

BAROMETRIC 30.31 in. Hg

RUN 2 SS

NOZZLE CALIBRATION

PRE	POST
.234	234
.234	234
.234	234
.234	234
AVERAGE	AVERAGE

FILTER 1389

METER READING

FINAL	148.500
INITIAL	72.800
NET	75.700

LEAK CHECK

SYSTEM

Pre	Post
✓ in. Hg	20 in. Hg
✓ cfm	.018 cfm

PITOT: Pre ☑ impact ☑ static; Post ☑ impact ☑ static

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	227	100	0	1498.0
INITIAL	100	100	0	1478.0
NET	127	0	0	20.0

TOTAL 147.0

GAS ANALYSIS

O_2 7.3

CO_2 12.0

CO -

STATIC +1.25 in. H_2O

BAROMETRIC 30.31 in. Hg

RUN 3 SS

NOZZLE CALIBRATION

PRE	POST
.243	.243
.243	.243
.243	.243
.243	.243
AVERAGE	AVERAGE

FILTER 1390

METER READING

FINAL	127.742
INITIAL	49.800
NET	77.942

LEAK CHECK

SYSTEM

Pre	Post
✓ in. Hg	20 in. Hg
✓ cfm	.006 cfm

PITOT: Pre ☑ impact ☑ static; Post ☑ impact ☑ static

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	223	110	0	1533.0
INITIAL	100	100	0	1505.0
NET	123	10	0	28.0

TOTAL 161.0

GAS ANALYSIS

O_2 7.3

CO_2 12.0

CO ____

STATIC +1.25 in. H_2O

BAROMETRIC 30.31 in. Hg

PAGE 1 OF ____

Port # / Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F) Stack	Probe	Hot Box	Imp.	Gas Meter In	Gas Meter Out	Vac. in. H_g
1-1	6:49	6.450	.45	.64	322			66	78	76	3
2	:51	7.800	.13	.19	318			64	76	76	2
3	:53	8.200	.31	.44	321			✓	77	76	2
4	:55	9.200	.57	.81	321			✓	77	78	3
5	:57	9.800	.99	1.41	322			✓	77	76	5
6	:59	10.860	1.35	1.92	323			✓	77	76	6
2-1	7:02	12.330	.26	.37	323			61	77	76	2
2	:04	13.100	.28	.40	322			✓	77	76	2
3	:06	13.700	.28	.40	322			✓	77	76	2
4	:08	14.650	.40	.56	322			✓	79	76	3
5	:10	15.500	.72	1.02	322			✓	79	76	4
6	:12	16.400	1.83	2.60	322			✓	79	76	8
3-1	7:15	17.860	.14	.19	322			59	80	76	2
2	:17	18.400	.26	.37	322			✓	79	77	3
3	:19	19.200	.41	.58	324			✓	80	77	3
4	:21	20.100	.58	.83	325			✓	80	77	3
5	:23	21.200	.83	1.18	324			✓	80	77	3
6	:25	22.200	1.15	1.64	324			✓	80	77	3
4-1	7:28	23.220	.17	.24	323			✓60	80	77	2
2	:30	23.950	.24	.34	324			✓	80	77	2
3	:32	24.600	.72	1.02	324			✓	80	77	2
4	:34	25.100	1.23	1.75	325			✓	81	77	7
5	:36	26.700	1.19	1.69	325			✓	81	77	8
6	:38	28.300	.83	1.18	323			✓	81	77	5
5-1	7:41	29.380	.36	.51	323			59	81	77	5
2	:43	30.200	.73	1.03	324			✓	81	77	5
3	:45	31.200	1.60	2.27	325			✓	81	77	8
4	:47	33.000	1.10	1.57	326			✓	81	77	8
5	:49	34.300	.72	1.02	325			✓	81	77	5
6	7:51	35.300	.44	.62	325			✓	.81	77	3
7-1	7:53	36.300	.92	1.34	305			58	83	78	5
2	:55	37.300	.75	1.10	306			✓	83	78	5

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co Date 5-8-96

Site Smith Unit 1 Steady State Run # 1 S.S. Page ______ Of ___

⊗

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F) Stack	Probe	Hot Box	Imp.	Gas Meter In	Out	Vac. in. H_g
7-3	:57	38.700	.64	.93	307			60	83	78	5
4	:59	39.700	.67	.98	307			✓	83	78	5
5	8:01	40.740	.72	1.05	308			✓	83	78	5
6	:03	42.200	.78	1.13	307			✓	83	78	5
7-1	:05	42.950	.99	1.44	306			✓60	83	78	6
2	:07	44.300	.75	1.10	307			✓	84	79	5
3	:09	45.300	.67	.98	307			✓	84	79	5
4	:11	46.800	.72	1.05	313			✓	84	79	5
5	:13	47.700	.72	1.05	313			✓	84	79	5
6	:15	48.200	.69	1.00	306			✓	84	79	5
8-1	8:18	49.600	.99	1.44	307			✓61	83	79	7
2	:20	50.900	.63	.92	307			✓	84	79	5
3	:22	52.000	.78	1.13	307			✓	84	79	6
4	:24	53.000	.92	1.34	318			✓	85	80	6
5	:26	54.250	.74	1.08	308			✓	85	80	5
6	:28	55.300	.92	1.34	308			✓	85	80	7
9-1	8:31	56.680	.67	.98	308			✓61	85	80	5
2	:33	57.800	1.02	1.49	318			✓	85	80	7
3	:35	59.200	.83	1.21	308			✓	85	80	6
4	:37	60.400	.77	1.12	308			✓	86	80	6
5	:35	61.600	.66	.97	305			✓	86	80	6
6	:41	62.600	.67	.98	310			✓	86	80	6
10-1	:44	63.800	.81	1.18	309			61	86	80	5
2	:46	64.800	.81	1.18	308			✓	86	80	5
3	:48	66.000	1.02	1.49	309			✓	86	80	6
4	:50	67.200	.98	1.43	309			✓	86	80	6
5	:52	69.000	.95	1.39	310			✓	86	80	6
6	:54	69.900	.95	1.39	310			✓	86	80	6
	:56	71.200									

.8357

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co

Date 5-8-96

Site Smith Unit 1 Steady State

Run # 1 S.S.

Page ____ Of ____

9:14

Port #		Gas Meter	Vel. Head	Orifice Head	Temperature (F)						Vac.
		Vol.	ΔP	ΔH			Hot		Gas Meter		in. H_g
Point #	Time	(cu. ft.)	in. H_2O	in. H_2O	Stack	~~Probe~~	~~Box~~	Imp.	In	Out	
1-1	9:~~14~~	72.800	.22	.42	323			67	84	82	2
2	:16	73.600	.11	.21	324			67	83	82	2
3	:18	74.300	.24	.44	328			✓	84	82	3
4	:20	75.075	.35	.65	330			✓	84	82	3
5	:22	76.000	.98	1.82	331			✓	84	82	6
6	:24	77.300	1.45	2.70	330			✓	84	82	6
2-1	9:26	79.100	.20	.37	328			61 ✓	~~82~~ 87	82	6
2	:28	80.000	.29	54	330			✓	87	83	3
3	:30	80.700	.31	.57	330			✓	87	83	3
4	:32	81.600	.43	80	330			✓	87	83	3
5	:34	82.400	.90	1.67	330			✓	87	83	6
6	:36	83.600	1.80	3.35	330			✓	87	83	~~8~~ 11
3-1	9:38	85.440	.16	.29	329			59	88	83	3
2	:41	86.000	.26	.48	333			✓	87	83	3
3	:43	86.900	.36	.66	331			✓	87	83	4
4	:45	87.700	.67	1.25	332			✓	87	83	4
5	:47	89.400	.98	1.82	332			✓	87	83	7
6	:49	90.600	1.25	2.32	331			✓	87	83	7
4-1	9:52	91.950	.16	.30	330			62	89	84	7
2	:54	92.700	.18	.33	331			✓	88	84	3
3	:56	93.300	.53	.99	332			✓	88	84	5
4	:58	94.700	1.42	2.64	332			✓	88	84	9
5	10:00	96.100	1.28	2.38	332			✓	88	84	8
6	:02	98.000	.96	1.78	332			✓	88	84	7
5-1	10:05	99.100	.47	.87	332			62	90	85	5
2	:07	100.300	.58	1.07	333			✓	90	85	5
3	:09	101.300	1.32	2.45	333			✓	90	85	10
4	:11	102.700	1.25	2.34	333			✓	90	85	9
5	:13	104.500	1.04	1.95	334			✓	91	85	8
6	:15	106.040	.52	.98	332			✓	91	85	6
7-1	10:18	107.330	.62	1.16	312			✓	92	85	7
2	:20	108.600	.85	1.55	310			✓	92	85	7

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co Date 5-8-96

Site Smith Unit 1 Steady State Run # 2 SS Page ____ Of ____

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)				Gas Meter		Vac. in. H_g
					Stack	Probe	Hot Box	Imp.	In	Out	
7-3	10:22	109.700	.64	1.20	312			59	90	85	7
4	:24	111.200	.60	1.12	312			✓	90	85	6
5	:26	112.200	.~~66~~72	1.35	308			✓	90	85	6
6	:28	113.500	89	1.67	311			✓	91	86	7
8-1	10:31	115.230	.92	1.72	313			58	91	86	5
2	:33	115.900	.85	1.55	313			✓	91	86	7
3	:35	117.350	.82	1.53	313			✓	91	86	7
4	:37	118.800	1.00	1.88	313			✓	91	86	8
5	:39	120.350	.76	1.42	313			✓	91	86	6
6	:41	121.600	1.03	1.93	313			✓	91	86	7
9-1	10:43	123.100	1.02	1.96	312			57	91	86	8
2	:45	124.600	.77	1.45	312			✓	91	86	8
3	:47	126.100	.72	1.35	312			✓	91	86	7
4	:49	127.400	.72	1.35	313			✓	91	86	7
5	:51	128.500	.72	1.35	313			✓	91	86	7
6	:53	129.800	1.03	1.93	314			✓	91	86	7
10-1	10:56	131.200	1.00	1.87	312			54	91	86	5
2	58	132.650	1.03	1.93	313			✓	91	86	8
3	11:00	134.200	87	1.63	313			✓	91	86	8
4	:02	136.000	.94	1.76	314			✓	91	86	8
5	:04	137.150	.94	1.76	314			✓	91	86	7
6	:06	138.460	.94	1.76	314			✓	91	86	8
10-1	:09	140.100	.84	1.58	313			58	91	86	8
2	:11	141.400	.85	1.55	313			✓	91	86	7
3	:13	142.600	1.00	1.88	314			✓	91	86	7
4	:15	143.800	1.08	2.02	315			✓	91	86	7
5	:17	145.600	1.04	1.95	315			✓	92	86	7
6	:19	147.000	1.04	1.95	315			✓	92	86	7
	11:21	148.500									

.8568

Check Indicates Temperatures Meet Required Limits.

Company GA Power Co

Date 5-8-96

Site Smith Unit 1 Steady State

Run # 2 S.S.

Page ____ Of ____

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)						Vac. in. H_g
					Stack	Probe	Hot Box	Imp.	Gas Meter		
									In	Out	
1-1	12:40	49.800	.30	.66	331			65	87	86	5
2	:42	50.800	.17	.37	331			✓	87	86	3
3	:44	51.500	.20	.44	333			✓	87	86	3
4	:46	52.350	.44	.96	333			✓	87	86	5
5	:48	53.260	.88	1.92	333			✓	88	86	8
6	:50	54.700	1.22	2.66	332			✓	89	86	10
2-1	12:53	56.400	.33	.72	331			65	89	86	5
2	:55	57.500	.23	.50	331			✓	89	86	4
3	:57	58.250	.23	.50	332			✓	90	86	4
4	:59	59.080	.36	.78	332			✓	90	86	5
5	13:01	60.000	.77	1.68	333			✓	90	87	5
6	:03	61.000	1.66	3.63	332			✓	91	87	15
3-1	13:07	62.870	.33	.72	331			64	91	87	5
2	:09	63.800	.29	.63	332			✓	91	87	5
3	:11	64.750	.29	.63	332			✓	91	87	5
4	:13	65.600	.41	.89	332			✓	91	87	5
5	:15	66.600	.57	1.24	333			✓	91	87	7
6	:17	67.800	.93	2.03	332			✓	91	87	9
4-1	13:19	69.280	.18	.39	330			64	91	87	9
2	:21	70.000	.27	.58	332			✓	91	87	5
3	:23	70.900	.82	1.79	332			✓	91	87	8
4	:25	72.200	1.17	2.55	333			✓	91	87	11
5	:27	73.200	1.03	2.25	333			✓	91	87	11
6	:29	75.300	.87	1.90	332			✓	92	87	10
5-1	13:31	76.900	.38	.82	332			60	92	87	6
2	:33	78.200	.62	1.35	332			✓	92	87	7
3	:35	79.400	.58	1.26	332			✓	92	87	7
4	:37	80.450	1.38	3.01	332			✓	92	87	14
5	:39	82.100	1.08	2.35	333			✓	92	87	12
6	:41	83.800	.82	1.79	332			✓	92	87	9
7-1	13:44	85.270	.67	1.46	311			✓	92	87	7
2	:46	86.500	.72	1.57	311			✓	92	87	8

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co Date 5-8-96

Site Smith Un. #1 Steady State Run # 3 5.5. Page ____ Of ____

⊗

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F) Stack	Probe	Hot Box	Imp.	Gas Meter In	Gas Meter Out	Vac. in. H_g
7-3	13:48	87.900	.64	1.39	311			61	91	87	8
4	:50	89.120	.67	1.50	310			✓	92	87	8
5	:52	90.500	.72	1.61	311			✓	92	87	8
6	:54	91.800	.77	1.72	310			✓	92	87	9
8-1	13:57	93.240	.83	1.85	311			62	91	87	9
2	:59	94.500	.83	1.85	311			✓	91	87	9
3	:01	95.860	.77	1.72	311			✓	91	87	9
4	:03	97.360	.92	2.05	311			✓	92	87	10
5	:05	98.830	.67	1.50	311			✓	92	87	10
6	:07	100.300	.92	2.05	311			✓	92	87	10
9-1	14:09	101.850	.70	1.56	310			✓63	92	87	8
2	:11	103.140	.86	1.92	310			✓	92	87	9
3	:13	104.560	.73	1.63	311			✓	92	87	9
4	:15	105.950	.64	1.43	311			✓	92	87	8
5	:17	107.330	.63	1.41	311			✓	92	87	8
6	:19	108.600	.63	1.41	311			✓	92	87	8
9-1	14:21	109.950	.72	1.60	310			62	92	87	9
2	:23	111.400	1.07	2.39	310			✓	92	87	11
3	:25	112.900	.73	1.63	310			✓	92	87	9
4	:27	114.320	.67	1.50	311			✓	92	87	9
5	:29	115.500	.70	1.56	312			✓	92	87	9
6	:31	117.020	.66	1.48	311			✓	92	87	9
10-1	14:34	118.320	.82	1.83	311			64	91	87	10
2	:36	119.700	1.07	2.39	310			✓	91	87	11
3	:38	121.350	.85	1.89	311			✓	91	87	10
4	:40	122.870	.92	2.05	311			✓	91	87	10
5	:42	124.400	1.07	2.39	311			✓	91	87	10
6	:44	125.900	1.06	2.37	311			✓	92	87	11.5
	14:46	127.742									

.8189

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co Date 5-8-96

Site Smith Unit 1 Steady State Run # 3 S.S. Page ______ Of____

⊗

LABORATORY ANALYSIS & CHAIN OF CUSTODY

COMPANY/PLANT: Gulf Power - Plant Smith -

UNIT #: 1 DATE OF TEST: 5-8-96 TYPE OF TEST: ☐ M-5 ☒ M-17 ☐ OTHER ______

SAMPLE #	RELINQUISHED BY	RECEIVED BY	TIME	DATE	REASON FOR CHANGE
3 Filters				5-13-96	To Lab
3 Wash			pm		No change

UNIT # 1- Steady State

RUN # 1	FILTER # 1388	BEAKER # 14 WASH (ML) 50
FINAL WEIGHT	155.2	65635.3
INITIAL WEIGHT	122.2	65619.5
DIFFERENCE	33.0	15.8
CORRECTED TOTAL WEIGHT		48.8
RUN # 2	FILTER # 1389	BEAKER # 17 WASH (ML) 47
FINAL WEIGHT	149.1	68327.4
INITIAL WEIGHT	121.2	68324.1
DIFFERENCE	27.9	3.3
CORRECTED TOTAL WEIGHT		31.2
RUN # 3	FILTER # 1390	BEAKER # 32 WASH (ML) 52
FINAL WEIGHT	148.3	64728.6
INITIAL WEIGHT	124.6	64723.2
DIFFERENCE	23.7	5.4
CORRECTED TOTAL WEIGHT		29.1
RUN #	FILTER #	BEAKER # WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		

UNIT # ______

RUN #	FILTER #	BEAKER # WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
RUN #	FILTER #	BEAKER # WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
RUN #	FILTER #	BEAKER # WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
WASH SOLVENT BLANK (ML)	100	BEAKER # 49 WASH (ML) 100
FINAL WEIGHT		65918.9
INITIAL WEIGHT		65918.9
DIFFERENCE		0.0
CORRECTION FACTOR (MG/ML)		0.0

ALL WEIGHTS ARE IN MILLIGRAMS (MG)

APPENDIX B SAMPLE CALCULATIONS

Input and Constants

$$f := \frac{9820\ ft^{3}}{mm\ btu}$$

$pg := 1.25\ in.\ H2O$

$pbar := 30.31\ in.\ Hg.$

$\Delta havg := 1.07\ in.\ H2O$

$y := 1.038$

$tm := 79.9\ °F$

$o2 := 7.2$

$co2 := 12.$

$vm := 64.8\ ft^{3}$

$vlc := 116.5\ ml$

$theta := 120\ min$

$nozdia := 0.219\ in.$

$ts := 315.6\ °F$

$as := 210.88\ ft^{2}$

$mn := 48.8\ mg$

$numberofpoints := 60$

$sqrt\Delta p := 0.8357\ in.\ H2O^{0.5}$

$$kp := \frac{85.49\ 1\ ft\ 1\ \left(\frac{lb\ in.\ Hg.}{lb\text{-}mole\ °R\ in.\ H2O}\right)^{0.5}}{1\ sec}$$

$cp := 0.84$

$$k1 := \frac{17.64\ °R}{in.\ Hg.}$$

$$ts = \frac{(ts + 460\ °F)\ °R}{°F}$$

775.6 °R

$$tm = \frac{(tm + 460\ °F)\ °R}{°F}$$

539.9 °R

$$n2 = 100 - o2 - co2$$

80.8

$$an = \frac{nozdia^{2}\ \ 3.1416}{4\ \left(\frac{12\ in.}{ft}\right)^{2}}$$

$0.000261587\ ft^{2}$

Calculations

Equation 1

$$ps = pbar + \frac{pg}{\frac{13.6\ in.\ H2O}{1\ in.\ Hg.}}$$

30.4019 in. Hg.

Equation 2

$$pm = pbar + \frac{\Delta havg}{\frac{13.6\ in.\ H2O}{in.\ Hg.}}$$

30.3887 in. Hg.

Equation 3

$$vmstd = \frac{k1\ vm\ y\ \left(pbar + \frac{\Delta havg}{\frac{13.6\ in.\ H2O}{in.\ Hg.}}\right)}{tm}$$

$66.7835\ ft^3$

Equation 4

$$vwstd = \frac{0.04707\ ft^3\ vlc}{ml}$$

$5.48365\ ft^3$

Equation 5

$$bws = \frac{vwstd}{vmstd + vwstd}$$

0.0758803

Equation 6

$$md = \frac{(0.44\ co2 + 0.32\ o2 + 0.28\ n2)\ lb}{lb\text{—}mole}$$

$$\frac{30.208\ lb}{lb\text{—}mole}$$

Equation 7

$$ms = md\ (1 - bws) + \frac{bws\ 18\ lb}{lb\text{—}mole}$$

$$\frac{29.2817\ lb}{lb\text{—}mole}$$

Equation 8

$$vs = kp\ cp\ sqrt\Delta p\ \left(\frac{ts}{ms\ ps}\right)^{0.5}$$

$$\frac{56.0165\ ft}{sec}$$

Equation 9

$$qa = \frac{vs\ as\ 60\ sec}{min}$$

$$\frac{708765.\ ft^{3}}{min}$$

Equation 10

$$qs = \frac{qa\ (1 - bws)\ 528\ {}^{\circ}R\ ps}{ts\ 29.92\ in.\ Hg.}$$

$$\frac{453071.\ ft^{3}}{min}$$

Equation 11

$$cs = \frac{0.0154\ gr\ mn}{mg\ vmstd}$$

$$\frac{0.0112531\ gr}{ft^{3}}$$

Equation 12

$$pmr = \frac{cs\ qs\ 60\ min}{hour\ \frac{7000\ gr}{lb}}$$

$$\frac{43.7009\ lb}{hour}$$

Equation 13

$$e = \frac{cs\ f\ 20.9\ 1\ lb}{(20.9 - o2)\ 7000\ gr}$$

$$\frac{0.024083\ lb}{mm\ btu}$$

Equation 14

$$vn = \frac{ts\ \left(\frac{0.002669\ in.\ Hg.\ ft^{3}\ vlc}{ml\ ^{\circ}R} + \frac{vm\ y\ pm}{tm}\right)}{ps}$$

$$104.517\ ft^{3}$$

Equation 15

$$i = \frac{100\ \%\ vn}{\frac{60\ sec\ theta\ vs\ an}{min}}$$

$99.0655\ \%$

Equation 16

$$hi = \frac{pmr}{e}$$

$$\frac{1814.6\ mm\ btu}{hour}$$

APPENDIX C QUALITY CONTROL

INITIAL
METER CALIBRATION FORM - DGM

DATE: 12-10-95 Box No. S-100

Ref. DGM Ser. # 1044453 Calibrated By JACK COVINGTON

RUN #	1	2	3	4	5
DELTA H (DGM)	0.50	1.00	1.50	2.00	3.00
Y (Ref. DGM)	1.014	1.014	1.014	1.014	1.014
Reference DGM					
Gas Vol. Initial	10.000	16.400	22.000	28.500	34.600
Gas Vol. Final	15.800	21.600	28.000	34.000	40.800
Meter Box DGM					
Gas Vol. Initial	90.495	96.775	102.265	108.630	114.610
Gas Vol. Final	96.195	101.880	108.140	114.015	120.650
Reference DGM Temp.	Avg.	Avg.	Avg.	Avg.	Avg.
Deg F Initial	68	69	68	69	70
Deg F Final	69	68	69	70	69
Meter Box DGM					
Temp. Initial In	68	72	75	78	79
Temp. Initial Out	66	68	69	71	71
Temp. Final In	72	75	77	79	80
Temp. Final Out	68	69	70	71	72
P Bar IN. Hg	30.08	30.08	30.08	30.08	30.08
Time (sec.)	849	549	524	418	390
Meter Calibration Factor (Y)	1.031	1.035	1.040	1.041	1.045
Qm (C.F.M.)	0.418	0.579	0.700	0.803	0.970
Km (Std Pressure)	0.759	0.743	0.733	0.727	0.717
DELTA Ha	1.62	1.68	1.72	1.74	1.78

Average Y (Meter Calibration Factor	1.038
Average Km (Standard Pressure)	0.736
Average DELTA Ha of Orifice	1.706

Y= ≤ .03
Max & Min ≤ .02 from Avg
Final Avg within 5% of Initial Avg
ΔHa = Max & Min ≤ .2 from Avg

POST TEST QUALITY ASSURANCE

Date: 5/16/96 BOX #: **S-100**

Ref. Meter: 1044453 Calibrated By: **JACK COVINGTON**

DRY GAS METER

	Unit	Run 1	Run 2	Run 3
FIELD METER ΔH	In. H_2O	1.50	1.50	1.50
Initial Gas Volume	Ft.^{3}	56.400	61.700	69.000
Final Gas Volume	Ft.^{3}	61.700	69.000	120.155
Initial Temp. In	°F	76	76	76
Initial Temp. Out	°F	76	77	78
Final Temp. In	°F	73	73	73
Final Temp. Out	°F	72	72	72
REF. METER Y	*Dimensionless*	1.014	1.014	1.014
Initial Gas Volume	Ft.^{3}	18.540	23.788	31.040
Final Gas Volume	Ft.^{3}	23.788	31.040	81.700
Initial Temp.	°F	77	85	91
Final Temp.	°F	73	79	85
Barometric Pressure	In. Hg	30.01	30.01	30.01
Time	sec	465	644	4502
Meter Calibration Factor	*Dimensionless*	0.999	0.990	0.976
$\Delta H_{@}$	In. H_2O	1.801	1.855	1.898
Average Y	*Dimensionless*	0.988		
Initial Y	*Dimensionless*	1.038		
Percent Error	%	-4.8	*(Allowed 5.0%)*	

DIFFERENTIAL PRESSURE GAUGE

Ref. Pressure in H_2O	Magnehelic Pressure in H_2O	Percent Error (+/- 5%)
0.00	0.00	0
0.75	0.76	1.333333333
0.39	0.39	0

TEMPERATURE SENSOR

Ref. Temp. (°F)	Thermocouple Temp. (°F)	Percent Error (Allowed 1.5% of Absolute)
280	279	-0.14

ARENOID BAROMETER

Reference Barometer	Test Barometer	0.1 Diff. Allowed
30.01	30.08	0.07

MAGEHELIC CALIBRATION

BOX	2879	S-100	C-133	C-175	S-102	S-101	S-103
SER. NO.		91126AM 91	9126A M91	R90125 MR6	R74D	R22D	R20208 A617
RANGE	0-2	0-2	0-2	0-2	0-5	0-2	0-2
REFERENCE READING	FIELD DEVICE READING						
0.000		0.00	0.00	0.00	0.00	0.00	0.00
0.050							
0.150							
0.200							
0.250							
0.450							
0.50	0.50	0.51	0.50	0.51	0.51	0.50	0.50
1.00	0.99	1.01	0.98	1.01	1.01	0.98	1.01
1.30							
1.80	1.80	1.82	1.79	1.82	1.81	1.79	1.82
2.50							
4.50							
5.0							
9.0							
13.0							
22.0							

SIGNATURE: Edward A. Harris

DATE: 12-5-95

MAGEHELIC CALIBRATION

BOX #1

SER. NO.	10720-AB68	R1061-6AG48	R5031-SEB76	R1062-9JA82	R1051-3MR42	R90124 RI119	
RANGE	0-0.25	0-0.50	0-2	0-5	0-10	0-25	
REFERENCE READING	FIELD DEVICE READING						
0.000	0.000	0.000	0.000	0.000	0.000	0.000	
0.050	0.050						
0.150	0.150	0.140					
0.200	0.190						
0.250		0.250					
0.450		0.450					
0.50			0.50				
1.00			1.00				
1.30				1.30			
1.80			1.80				
2.50				2.50	2.48		
4.50				4.50			
5.0					5.0	5.0	
9.0					9.02		
13.0						13.0	
22.0						22.0	

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION

BOX #2

SER. NO.	10819-DR2	R1090-2AG18	R50315-EB93	R1062-9TA87	30830-AM79	R1072-2MC5
RANGE	0-0.25	0-0.50	0-2	0-5	0-10	0-25
REFERENCE READING			FIELD DEVICE READING			
0.000	0.000	0.000	0.00	0.00	0.0	0.0
0.050	0.050					
0.150	0.155	0.152				
0.200	0.205					
0.250		0.256				
0.450		0.456				
0.50			0.52			
1.00			1.04			
1.30				1.32		
1.80			1.83			
2.50				2.55	2.49	
4.50				4.50		
5.0					4.9	5.2
9.0					8.8	
13.0						12.9
22.0						22.0

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION
BOX #3

SER. NO.		R10908AG71 MRR1	R0112642		R10608CF20 CF20		
RANGE		0-0.50	0-2.0		0-10		
REFERENCE READING			FIELD DEVICE READING				
0.000		0.00	0.00		0.0		
0.050							
0.150		0.149					
0.200							
0.250		0.240					
0.450		0.450					
0.50			0.50				
1.00			0.98				
1.50							
1.80			1.78				
2.50					2.5		
4.50							
5.0					5.0		
9.0					9.0		
13.0							
22.0							

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION

BOX #4

SER. NO.	R22D	R90051 6GT21	R90101 5CD102
RANGE	0-0.50	0-5	0-25
REFERENCE READING	FIELD DEVICE READING		
0.000	0.000	0.00	0.0
0.050			
0.150	0.151		
0.200			
0.250	0.251		
0.450	0.455		
0.50			
1.00			
1.30		1.27	
1.80			
2.50		2.52	
4.50		4.55	
5.0			5.0
9.0			
13.0			13.0
22.0			21.6

SIGNATURE: Edward L. Harris

DATE: 12/22/95

TEMPERATURE CALIBRATIONS - DEGREES FAHRENHEIT

REFERENCE DEVICE READING*	0 DEG. F	210 DEG.	420 DEG.	630 DEG.	840 DEG.	1050 DEG.	1260 DEG.	1470 DEG.	1680 DEG.	1900 DEG.
2879	0	217	421	630	839	1050	1260	1471	1681	1900
METER BOX #1 C-133 11580	0	212	423	635	842	1053	1264	1475	1679	1910
METER BOX #2 C-175 15962	0	211	423	627	839	1052	1265	1475	1687	1903
METER BOX #5 S-100 15751	2	211	417	628	844	1062	1279	1491	1698	1907
METER BOX #6 S-101 15751	0	210	419	628	839	1058	1255	1473	1691	1900
PORTABLE THERMOCOUPLE # 2 (Blue)	2	209	415	628	837	1053	1260	1468	1679	1908
PORTABLE THERMOCOUPLE # 2 (Green)	2	211	417	627	842	1058	1273	1484	1688	1896
PINK T140293	-1	208	415	624	840	1056	1272	1482	1687	1894
PORTABLE THERMOCOUPLE (Yellow)	0	210	419	632	840	1050	1259	1470	1680	1901
PORTABLE THERMOCOUPLE T-105998 (Black)	1	209	416	625	839	1055	1270	1481	1684	1891
METER BOX S-102	-2	209	417	625	837	1049	1259	1462	1658	1890
METER BOX S-103	4	215	423	632	844	1057	1266	1471	1667	1895

DATE: 12-05-95 **SIGNATURE:** Edward L. Harris

* Reference Device is an Omega Engineering CL505-A calibrated reference thermocouple-potentiometer system.

SANDERS ENGINEERING &
ANALYTICAL SERVICES, Inc.

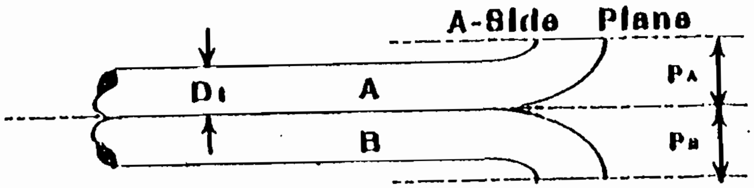
1565 Leroy Stevens Rd.
Mobile, AL. 36695

Office: (205) 633-4120
FAX#: (205) 633-2285

The Pitot used was within the following geometric specifications:

D_t between 0.48 and 0.95 cm (3/16 and 3/8 in.).

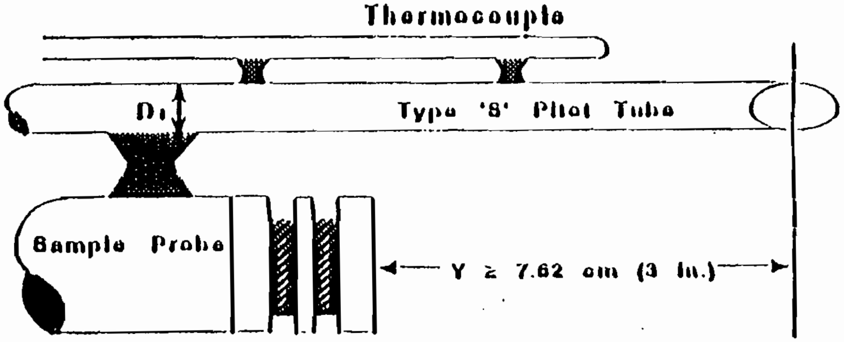
C_p = 0.84



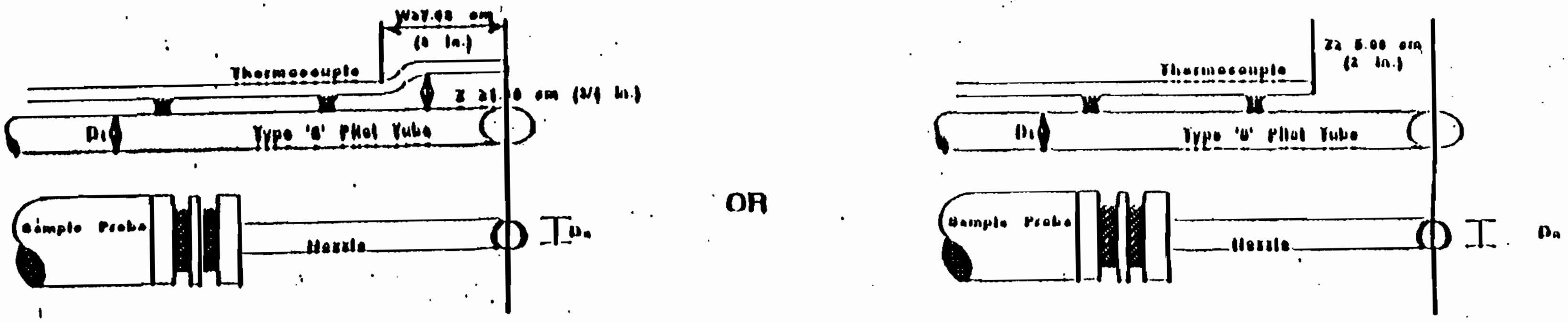
Note:

1.05 D_t ≤ 1.50 D_t

$P_A = P_B$



Minimum pitot-sample probe separation needed to prevent interference



Proper thermocouple placement to prevent interference.

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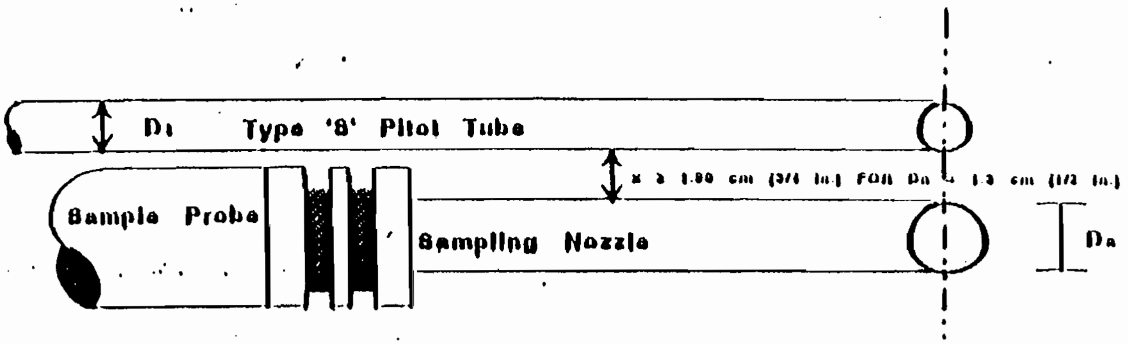
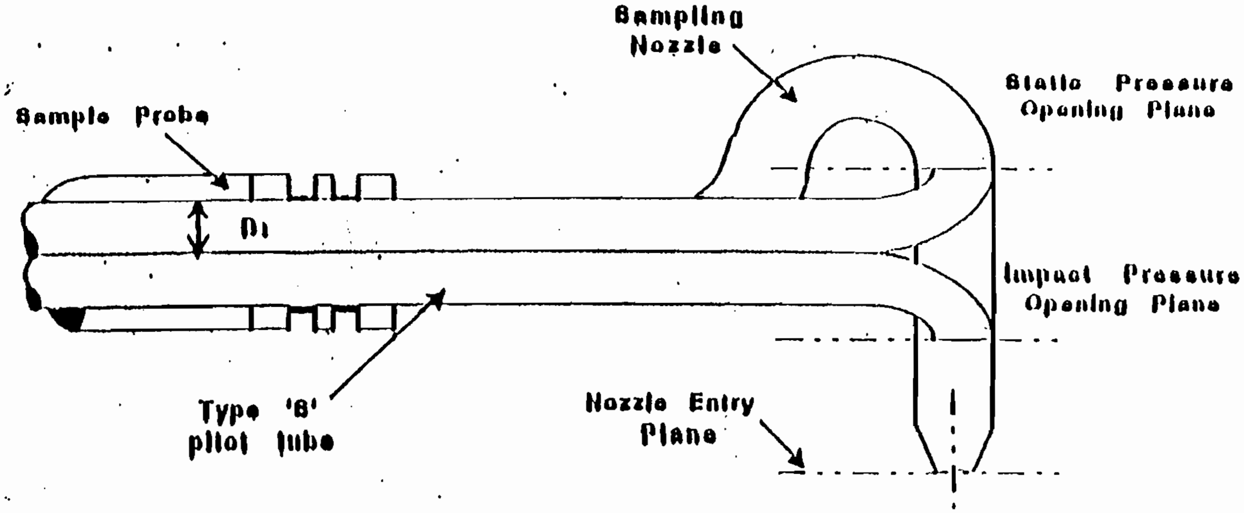
Proper pitot tube-sampling nozzle configuration to prevent aero-dynamic interference; buttonhook type nozzle; centers of nozzle and pitot opening aligned; Dt between 0.48 and 0.95 cm (3/16 and 3/8 in.)



Bottom view showing minimum pitot/nozzle separation



Side view; to prevent pitot tube from interfering with the gas flow streamlines approaching the nozzle, the impact pressure opening plane of the pitot tube shall be even with or above the nozzle entry plane.

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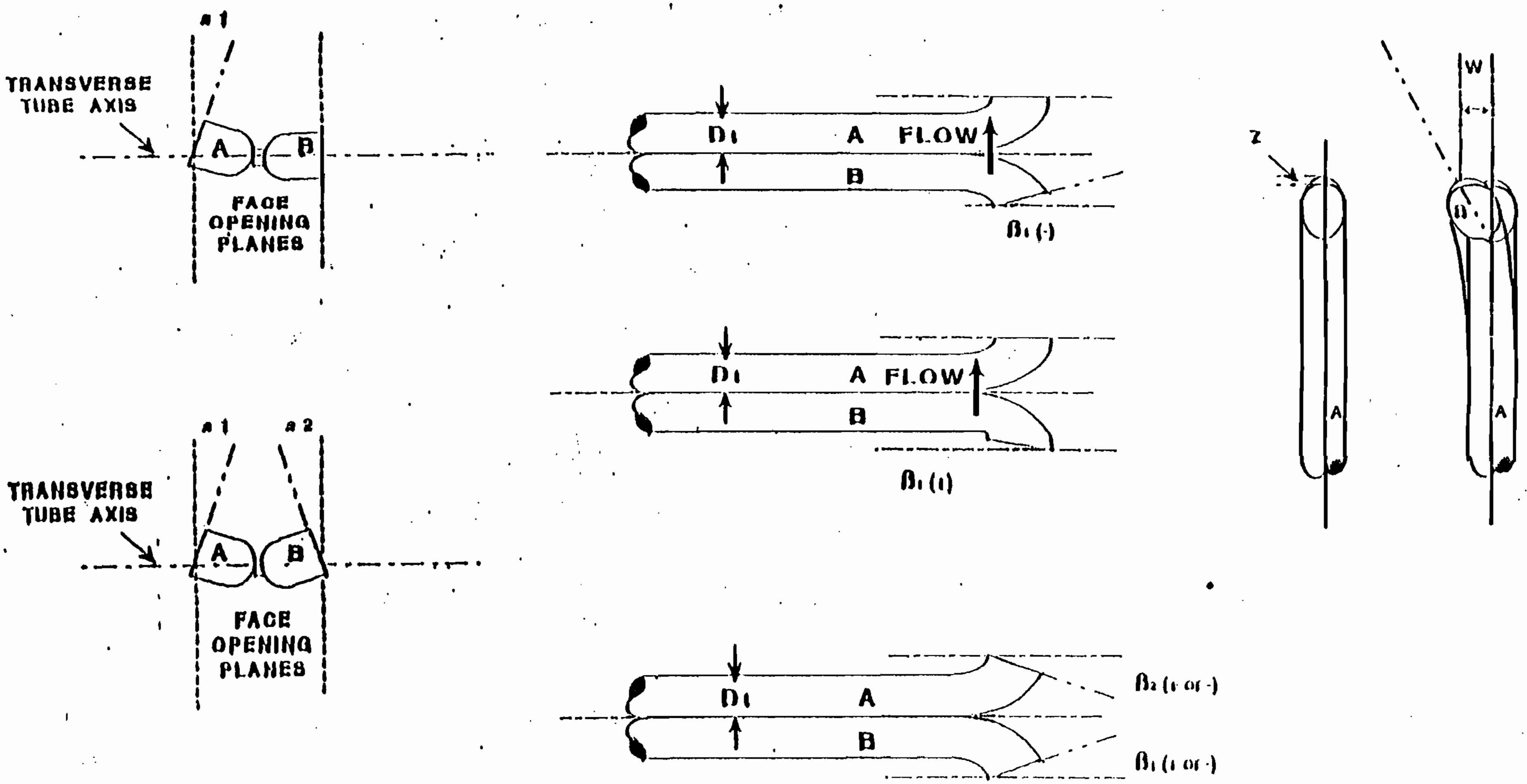
Types of face-opening misalignment that can result from field use or improper construction of type 'S' pitot tubes. These will not affect the baseline value of Cp(s) so long as α_1 and $\alpha_2 < 10°$, β_1 and $\beta_2 < 5°$, $z \leq$ 0.32 cm (1/8 in.)



APPENDIX D OPERATIONAL DATA

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST CHRONOLOGY
UNIT # 1
STEADY STATE CONDITIONS
May 8,1996

RUN # 1	START	6:49 a.m.	No problems noted at beginning of run.
	STOP	8:56 a.m.	No problems noted at end of run.
RUN # 2	START	9:14 a.m.	No problems noted at beginning of run.
	STOP	11:21 a.m.	No problems noted at end of run.
RUN # 3	START	12:40 p.m.	No problems noted at beginning of run.
	STOP	2:46 p.m.	No problems noted at end of run.

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 1
STEADY STATE CONDITIONS
May 8, 1996

TIME OF 6 MIN. AVERAGE	OPACITY (%)
(RUN # 1)	(RUN # 1)
6:49 - 6:54	3.6
6:55 - 7:00	3.6
7:01 - 7:06	3.8
7:07 - 7:12	3.6
7:13 - 7:18	3.7
7:19 - 7:24	3.6
7:25 - 7:30	3.6
7:31 - 7:36	3.8
7:37 - 7:42	3.5
7:43 - 7:48	3.8
7:49 - 7:54	3.7
7:55 - 8:00	3.8
8:01 - 8:06	3.9
8:07 - 8:12	3.6
8:13 - 8:18	3.8
8:19 - 8:24	3.6
8:25 - 8:30	3.5
8:31 - 8:36	3.8
8:37 - 8:42	3.5
8:43 - 8:48	3.5
8:49 - 8:54	3.5
8:55 - 8:56	3.6

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 1
STEADY STATE CONDITIONS
May 8, 1996

(RUN # 2)	(RUN # 2)
9:14 - 9:18	3.5
9:19 - 9:24	3.6
9:25 - 9:30	3.4
9:31- 9:36	3.7
9:37 - 9:42	3.4
9:43 - 9:48	3.6
9:49 - 9:54	30.4
9:55 - 10:00	2.5
10:01 - 10:06	2.6
10:07 - 10:12	2.4
10:13 - 10:18	2.5
10:19 - 10:24	2.5
10:25 - 10:30	2.4
10:31 - 10:36	3.0
10:37 - 10:42	2.5
10:43 - 10:48	2.5
10:49 - 10:54	2.7
10:55 - 11:00	2.4
11:01 - 11:06	2.7
11:07 - 11:12	2.5
11:13 - 11:18	2.9
11:19 - 11:21	2.9

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 1
STEADY STATE CONDITIONS
May 8, 1996

(RUN # 3)	(RUN # 3)
12:40 - 12:42	1.9
12:43 - 12:48	2.4
12:49 - 12:54	2.4
12:55 - 1:00	2.3
1:01 - 1:06	2.5
1:07- 1:12	2.0
1:13 - 1:18	2.3
1:19 - 1:24	2.2
1:25 - 1:30	2.1
1:31 - 1:36	2.4
1:37 - 1:42	2.1
1:43 - 1:48	2.5
1:49 - 1:54	2.4
1:55 - 2:00	2.6
2:01 - 2:06	2.9
2:07 - 2:12	2.6
2:13 - 2:18	2.7
2:19 - 2:24	2.8
2:25 - 2:30	2.7
2:31 - 2:36	3.1
2:37 - 2:42	2.3
2:43 - 2:46	2.7

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT SMITH

UNIT # 1

CONDITION: (circle one)

Sootblowing [✓ Steadystate]

RUN NUMBER: 1

Date: 5/8/96

OPERATIONAL DATA FORM

RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS/HR.)					PERCENT O2			PERCENT OPACITY	I.D. FAN AMPS			
					A	B	C	D		A	B	EMS		1 A	2 B	3	4
1	06:49	12.2×10^5	175	1.2×10^6	35.000	33.	37.	37.		2.58	2.18		3.6	185	185		
	08:56	12.2×10^5	175	1.2×10^6	[illegible]	33.	37.	38.		3.18	2.04		3.6	193	185		

Coal Integrator Readings

COMMENTS: Start: 06:49 Stop: 08:56

Ⓐ- 005167 Ⓐ- 006010

Ⓑ- 973135 Ⓑ- 973911

Ⓒ- 176131 Ⓒ- 176885

Ⓓ- 222335 Ⓓ- 223163

GAS TEMP (F) AIR PREHEATERS				PULVERIZER MILLS TEMPERATURES				
1	2	3	4	1	2	3	4	5

Best Available Copy

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT SMITH

UNIT # 1

CONDITION: (circle one)

Sootblowing Steadystate

RUN NUMBER: 2

Date: 5.8.96

OPERATIONAL DATA FORM

RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS/HR.)					PERCENT O2			PERCENT OPACITY	I.D. FAN AMPS			
					A	B	C	D		A	B	EMS		1	2	3	4
2	09:14	1.22×10^5	175	1.2x10^6	38.x10^3	34.	36.	37		3.50	2.28			192	185		
	11:21	1,220,000	175	1,200,000	38 K	34 K	36 K	37 K		3.37	2.50		2.90	195	185		

COMMENTS: Coal Integrator Readings

Start:	Stop
Ⓐ- 006094	Ⓐ- 006908
Ⓑ- 972991	Ⓑ- 974759
Ⓒ- 176962	Ⓒ- 177607
Ⓓ- 223247	Ⓓ- 224911

	GAS TEMP (F) AIR PREHEATERS				PULVERIZER MILLS TEMPERATURES				
	AIR IN		GAS OUT						
	1	2	3	4	1	2	3	4	5
	A	B	A	B					
@ 1121	126	169	308	345					

PCT ATTACHMENT

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # 1

CONDITION: (circle one)

Sootblowing [✓ Steadystate]

RUN NUMBER: 3

Date: 5/8/96

OPERATIONAL DATA FORM

RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS./HR.)					PERCENT O2			PERCENT OPACITY	I.D. FAN AMPS			
					A	B	C	D		A	B	EMS		1	2	3	4
3	1240	1,220,000	175	1,110,000	38 K	34 K	35 K	38 K		2.90	1.83	2.36	2.00	182	173		
	1446	1,220,000	175	1,110,000	39K	34K	37K	41K		2.80	1.95	2.36	2.90	190	175		

COAL INTEGRATOR READINGS

COMMENTS: Start: Stop:

Ⓐ - 007405 Ⓐ -008220

Ⓑ - 975194 Ⓑ -975938

Ⓒ - 178125 Ⓒ -178835

Ⓓ - 224535 Ⓓ -225363

GAS TEMP (F) AIR IN AIR PREHEATERS GAS OUT				PULVERIZER MILLS TEMPERATURES				
A 1	B 2	A 3	B 4	1	2	3	4	5
128	172	305	344					
127	170	305	343					

PCT ATTACHMENT

______ ELECTRIC GENERATING PLANT

Precipitator Readings

nit #1
ate 5-8-96
Load 175

Run # #1
Start Time 0649
Finish Time 0913

Precipitator Cabinet	Primary AMPS	Primary Volts	Secondary AMPS MA	Secondary Voltage KV
Start A	37	276	490	47.0
B	28	294	250	46.1
C	100	414	390	46.1
D	101	427	600	41.5
E	124	254	950	42.0
F	83	285	810	42.9
G	116	290	930	21.6
H	105	276	930	28.8
J	98	267	950	25.7
K	112	315	930	31.3
L	0	58	00	12.5
M	85	230	780	29.1
Finish				
A	50	292	320	46.4
B	39	328	80	40.1
C	60	299	780	50.1
D	127	407	850	47.3
E	136	267	1000	42.3
F	83	288	770	42.6
G	119	292	960	21.9
H	115	285	930	28.8
J	100	272	990	26.0
K	120	335	990	31.3
L	0	58	0	12.5
M	58	234	720	28.8

Smith ELECTRIC GENERATING PLANT

Precipitator Readings

nit #1
Date 5-8-96
Load 175

Run # 2
Start Time 0927
Finish Time 1139

Precipitator Cabinet	Primary AMPS	Primary Volts	Secondary AMPS MA	Secondary Voltage KV
Start A	32	256	360	46.1
B	23	281	150	43.2
C	91	337	770	49.5
D	94	362	700	46.7
E	139	270	1000	42.6
F	81	288	860	43.2
G	116	290	950	21.6
H	100	265	990	28.8
J	104	276	960	25.4
K	110	324	990	31.1
L	0	58	0	12.5
M	69	247	780	29.1
Finish				
A	28	243	510	44.8
B	29	281	120	42.3
C	46	267	510	47.0
D	79	335	500	43.2
E	138	270	960	41.7
F	77	276	820	43.2
G	110	276	950	21.3
H	100	265	1000	28.8
J	98	265	920	25
K	112	319	910	30.4
L	0	58	0	12.5
M	62	231	780	29.1

SMITH ELECTRIC GENERATING PLANT

Precipitator Readings

nit 1
Date 5-8-96
Load 175

Run # 3
Start Time 1240
Finish Time 1446

Precipitator Cabinet	Primary AMPS	Primary Volts	Secondary AMPS	Secondary Voltage
Start A	43	279	250	43.9
B	24	276	180	43.9
C	55	288	640	48.3
D	76	337	700	45.1
E	138	270	1130	43.2
F	86	290	610	41.0
G	119	288	930	21.3
H	117	288	1050	28.8
J	102	272	950	25.4
K	112	324	1050	31.6
L	0	58	0	12.5
M	64	234	810	28.2
Finish				
A	49	297	400	47.0
B	18	240	120	42.6
C	85	324	700	49.5
D	88	353	610	44.5
E	135	267	1050	42.6
F	86	290	720	41.7
G	115	283	960	21.3
H	116	281	950	28.2
J	102	270	930	25.4
K	112	317	1000	31.6
L	0	58	0	12.5
~~3800706~~ M	62	231	780	31

Cold Precips

Inlet

	IP	VP	IS	VS
start	110	429	830	40.7
Stop	110	429	830	41.0

Outlet

	IP	VP	IS	VS
start	28	15	180	34.8
stop	27	15	180	34.8

Cold Precips

Intel

	IP	VP	IS	VS
start	110	425	820	40.4
Stop	111	432	830	40.7

outlet

	IP	VP	Is	VS
start	27	15	180	33.8
stop	27	15	180	34.5

Cold Recipe

start

INLET

	IP	VP	IS	VS
start	109	427	820	40.1
finish	109	427	820	40.1

outlet

	IP	VP	IS	VS
start	27	13	180	33.5
finish	27	13	180	33.5

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.

PARTICULATE EMISSIONS TEST REPORT
SOOT BLOWING OPERATIONS

FOR

GULF POWER COMPANY
Plant Smith, Unit 1
Panama City, Florida

May 7, 1996

1568 LEROY STEVENS ROAD

MOBILE, ALABAMA 36695 • 205/633-4120

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ILLUSTRATIONS

1. INTRODUCTION

Sanders Engineering & Analytical Services, Inc. (SEAS), performed particulate emissions testing at Gulf Power Company, Plant Smith, Unit 1, located in Panama City, Florida. The test was conducted on May 7, 1996, during soot blowing operations. The testing was performed in accordance with the applicable U.S. EPA procedures specified at **40 CFR, Part 60, Appendix A, Methods 1, 2, 3, 4, and 17**.

The purpose of the test was to demonstrate compliance with the rules and regulations of the Florida Department of Environmental Protection, and to meet certain requirements contained in the permit to operate issued by the Florida Department of Environmental Protection.

The test was conducted by Mr. Jack Covington, Mr. Dean Holmes, Mr. John Holcombe, and Mr. John Wilson of Sanders Engineering & Analytical Services, Inc., and was coordinated with Mr. John McPherson of Gulf Power Company. The Florida Department of Environmental Protection was notified so that a representative could be present to observe the testing.

The test was conducted in accordance with the rules and regulations of the Florida Department of Environmental Protection. Further discussion of the test methods are included later in the report.

2. SUMMARY AND DISCUSSION OF RESULTS

The results of the particulate emissions testing for the soot blowing runs, along with the results of the computations, are summarized in Table I. The equations used in the calculation of the results, along with the completed field data sheets, are presented in Appendix A. The sample calculations of the first run are presented in Appendix B. The quality control checks of the equipment used in the sampling program are included in Appendix C.

There were no problems encountered during the performance of the test. The bottom port of side A duct was not sampled due to ash build-up in the duct. One of the other ports was alternately sampled twice on each run to compensate for the port not sampled. At the completion of each run, the filter and probe were removed to a relatively clean, draft-free area for clean-up.

The results of the testing indicate the particulate emission rate during soot blowing for Plant Smith, Unit 1, is 0.017 LBS/MMBTU. The applicable Florida Department of Environmental Protection rules and regulations require an emission rate of no greater than 0.30 LBS/MMBTU. The results of the testing indicate that the unit is in compliance with the particulate emission condition of the permit to operate issued by the Florida Department of Environmental Protection.

TABLE I. PARTICULATE EMISSIONS TEST RESULTS

GULF POWER COMPANY
PLANT SMITH, UNIT 1, SOOT BLOWING
5/7/96

Title of Run		RUN 1	RUN 2	RUN 3
Sampling Time -Start	Military	0712	1038	1402
Sampling Time -Stop	Military	0934	1247	1609
F Factor	SDCF/MMBTU	9820	9820	9820
Plant Load	Megawatts	173.0	173.0	173.0
Static Pressure	In. H2O	1.20	1.20	1.20
Barometric Pressure	In. Hg	30.31	30.31	30.31
Average dH	In. H20	0.98	1.37	1.63
Meter correction		1.038	1.038	1.038
Avg. Meter Temp.	Deg. F	79.5	89.7	91.6
% O2	%	8.1	7.8	7.1
%CO2	%	11.0	11.5	12.0
Volume Metered	ACF	65.150	73.440	81.430
Volume Water	Ml	136.0	131.5	151.0
Sampling Time	Minutes	120	120	120
Nozzle Diameter	Inches	0.219	0.234	0.243
Avg. Stack Temp.	Deg. F	315.2	323.0	322.8
Area of Stack	Sq. Feet	210.8800	210.8800	210.8800
Wt. of Part.	Mg.	28.3	48.8	37.7
Number of Points		60	60	60
Avg. Sqrt dP	In. H20	0.8114	0.8265	0.8364

RESULTS OF COMPUTATIONS

		RUN 1	RUN 2	RUN 3	Average
Volume of Gas Sampled	SDCF	67.180	74.397	82.261	
H2O vapor in Gas Stream	PERCENT	8.7	7.7	8.0	8.1
Avg. Stack Gas Velocity	FT/SEC	54.6	55.7	56.4	55.6
Volumetric Flow Rate	SDCFM	436,565	446,006	449,935	444,169
Volumetric Flow Rate	ACF/M	690,988	705,119	713,251	703,119
Particulate Conc.	Grs/SDCF	0.006	0.010	0.007	0.008
Particulate Conc.	Grs/ACF	0.004	0.006	0.004	0.005
Particulate Mass Rate	Lb/Hr	24.3	38.6	27.2	30.0
Particulate Mass Rate	Lb/MMBtu	0.015	0.023	0.015	0.017
Heat Input	MMBTU/Hr	1633.62	1708.07	1815.19	1718.96
Percent of Isokinetic	%	103.4	98.2	99.8	

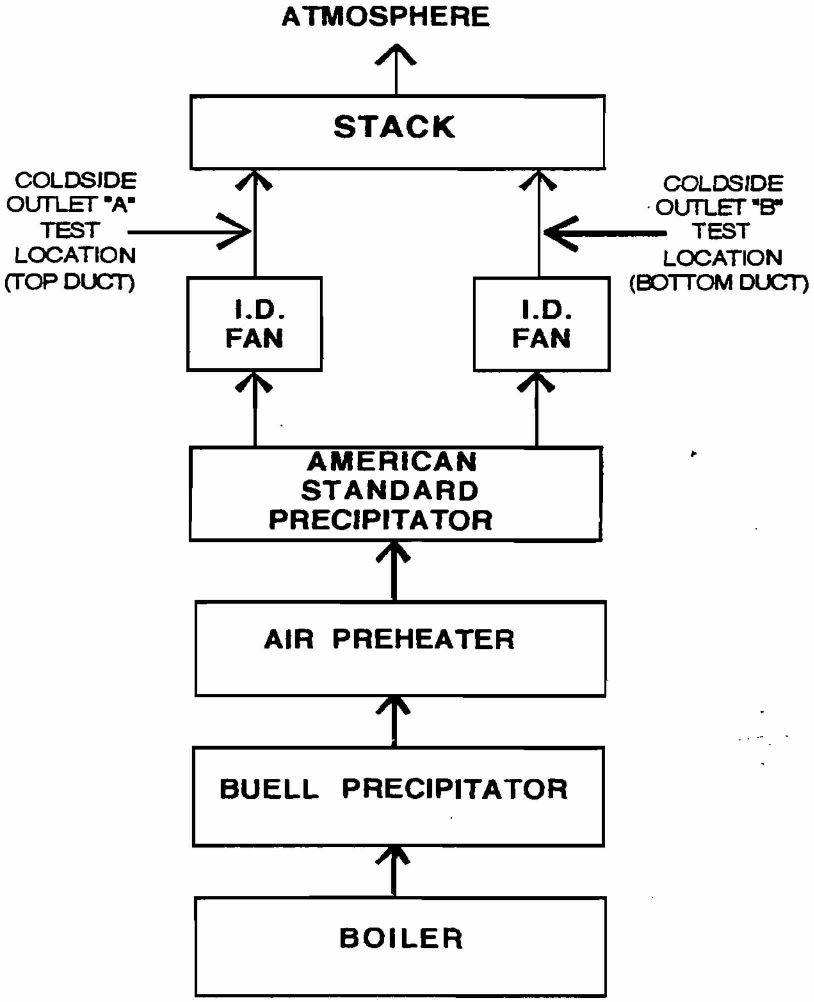
3. PROCESS DESCRIPTION

The process consists of a steam electric generating unit firing bituminous coal for the production of electric energy. The coal is received by either rail, truck, or barge, and loaded directly onto the conveyor feeding the plant, or onto the stockpile and later loaded onto the conveyor belt transporting the coal to the plant. The coal from the conveyor is loaded into bunkers capable of holding between 24 to 36 hours supply of coal. The coal is then fed to pulverizing mills before being fired in the unit through the burners. Upon combustion of the coal in the fire box, approximately 20 percent of the ash falls to the bottom of the boiler and is removed by the ash removal system. The remaining 80 percent exits with the flue gases through the heat exchange and economizer sections of the furnace, and is collected by electrostatic precipitators.

3.1. Source Air Flow

The air flow schematic which depicts the passage of the flue gases exhausted from Plant Smith, Unit 1, is presented in Figure 1.

Figure 1. Air Flow Schematic



3.2. Operation During Testing

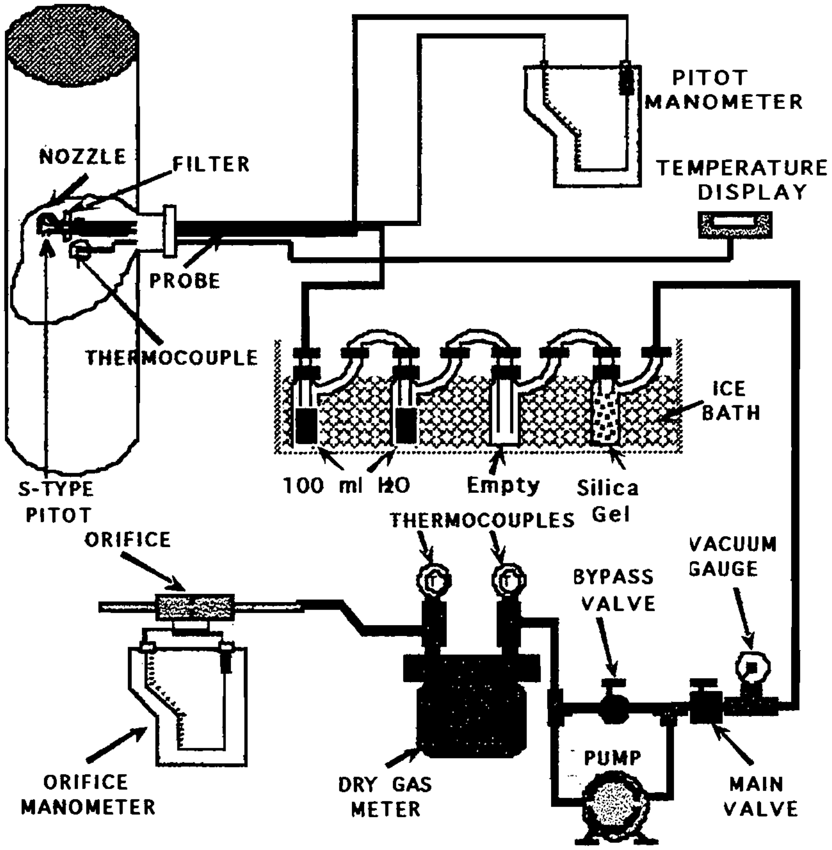
The approximate heat input average during soot blowing operation, as based on F-factor calculations, is 1718.96 million BTU per hour, resulting in the production of approximately 173 megawatts of electricity. Precipitator data supplied by Gulf Power personnel is given in Appendix D.

5. PARTICULATE SAMPLING PROCEDURE (EPA Method 17)

The sampling procedure utilized is that specified in **40 CFR, Part 60, Appendix A, Method 17**. A brief description of this procedure is as follows:

The first impingers were partially filled with 100 milliliters of deionized water. The next impinger was left empty to act as a moisture trap. Preweighed 6 to 16 mesh indication silica gel was added to the last impinger. The sampling equipment manufactured by Lear Siegler (Model 100) or Sanders Engineering (Model 200) was assembled as shown in the attached drawing. The system was leak checked by plugging the inlet to the nozzle and pulling a 15 inch mercury vacuum. A leakage rate not in excess of 0.02 cubic feet per minute was considered acceptable.

Figure 3. Particulate Sampling Train



The inside dimensions of the stack liner were measured and recorded. The required number of sampling points were marked on the probe for easy visibility. The range of velocity pressure, the percent moisture, and the temperature of the effluent

gases were determined. From this data, the correct nozzle size and the nomograph multiplication factor were determined.

Crushed ice was placed around the impingers. The nozzle was placed on the first traverse point with the tip pointing directly into the gas stream. The pump was started immediately and the flow was adjusted to isokinetic sampling conditions. After the required time interval had elapsed, the probe was repositioned to the next traverse point and isokinetic sampling was re-established. This was performed for each point until the run was completed. Readings were taken at each point and recorded on the field data sheet. At the conclusion of each run, the pump was turned off and the final readings were recorded.

5.1. Particulate Sample Recovery

Care was exercised in moving the collection train to the sample recovery area to minimize the loss of collected sample, or the gain of extraneous particulate matter. The volume of water in the impingers was measured, the silica gel impinger was weighed and recorded on the field data sheet. The nozzle, and all sample-exposed surfaces were washed with reagent grade acetone into a clean sample container. A brush was used to loosen any adhering particulate matter and subsequent washings were placed into the container. The filter was carefully removed from the fritted support and placed in a clean separate sample container. A sample of the acetone used in the washing was saved for a blank laboratory analysis.

5.2. Particulate Analytical Procedures

The filter and any loose particulate matter were transferred from the sample container to a clean, tared weighing dish. The filter was placed in a desiccator for at least 24 hours and then weighed to the nearest 0.1 milligram until a constant weight was obtained. The original weight of the filter was deducted, and the weight gain was recorded to the nearest 0.1 milligram.

The wash solution was transferred to a clean, tared beaker. The solution was evaporated to dryness, desiccated to a constant weight, and the weight gain was recorded to the nearest 0.1 milligram.

APPENDIX A EQUATIONS AND FIELD DATA SHEETS

EQUATIONS

1. $$P_s = P_{bar} + \frac{P_g}{13.6}$$

2. $$P_m = P_{bar} + \frac{\overline{\Delta H}}{13.6}$$

3. $$V_s = K_p C_p \overline{\sqrt{\Delta P}} \sqrt{\frac{\overline{T_s}}{M_s P_s}}$$

4. $$V_{m(Std)} = K_1 V_m Y \left[\frac{p_{bar} + \frac{\overline{\Delta H}}{13.6}}{\overline{T_m}} \right]$$

5. $$V_{w(Std)} = 0.04707\ V_{1c}$$

6. $$B_{ws} = \frac{V_{w(Std)}}{V_{m(Std)} + V_{w(Std)}}$$

7. $$M_d = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%N_2 + \%CO)$$

8. $$M_s = M_d(1 - B_{ws}) + 18\ (B_{ws})$$

9. $$EA = \left[\frac{(\%O_2 - 0.5\ (\%CO))}{0.264\ (\%N_2) - ((\%O_2) - 0.5\ (\%CO))} \right] 100$$

10. $$Q_a = (V_s)(A_s)(60)$$

11. $$Q_s = Q_a(1-B_{ws})\frac{(528)}{\overline{T_s}}\frac{(P_s)}{29.92}$$

12. $$E_H = \left(\frac{PMR}{H_I}\right)$$

13. $$E = C_d F_{O_2}\left(\frac{20.9}{20.9 - \%O_2}\right)$$

14. $$C_s = 0.0154\frac{M_n}{V_{m(Std)}}$$

15. $$C_{50} = \frac{21\ C_s}{21 - [(1.5)(\%O_2) - 0.133(N_2) - 0.75(\%CO)]}$$

16. $$C_{12} = \frac{C_s(12)}{\%CO_2}$$

17. $$PMR = (C_s)(Q_s)\frac{(60)}{7000}$$

18. $$V_n = \left[(0.002669)(V_{1c}) + \frac{V_m Y}{\overline{T_m}}\left(p_{bar} + \frac{\overline{\Delta H}}{13.6}\right)\right]\frac{\overline{T_s}}{p_s}$$

19. $$I = \frac{100\ V_n}{(60)\ \text{Ø}\ V_s\ A_n}$$

NOMENCLATURE

A_n = Cross-sectional area of nozzel, ft ^{2}

A_s = Cross sectional area of stack, ft ^{2}

B_{ws} = Wator vapor in the gas stream, proportion by volume (dimensionless)

C_p = Pitot tube coefficient (dimensionless) (0.84)

C_s = Particulate concentration, grains/SDCF

C_d = Particulate concentration, lbs/SDCF

C_{12} = Particulate concentration (C_s adjusted to 12% CO) grains/SDCF

C_{50} = Particulate concentration (C_s adjusted to 50% excess air) grains/SDCF

EA = Excess air, %

E = Emission in lb/mmBTU

E_H = Emission in lb/mmBTU, based on heat input

H_I = Total Heat Input, Million BTU per Hour (MMBTU/hr)

I = Percent of isokinetic sampling

K_1 = 17.64 °R/ inches Hg

K_p = Pitot tube constant,

$$85.49 \text{ ft/sec} \left[\frac{(\text{lb/lb-mole})\ (\text{in. Hg})}{(^\circ\text{R})\ (\text{inc. } H_2O)}\right]^{\frac{1}{2}}$$

M_n = Total amount of particulate collected, mg

M_d = Molecular weight of stack gas; dry basis, lb/lb mole

M_s = Molecular weight of stack gas; wet basis, lb/lb mole

P_{bar} = Barometric pressure at the sampling site, in. Hg

NOMENCLATURE (continued)

P_m = Meter pressure, in. Hg

P_s = Absolute stack pressure, in. Hg

P_g = Stack static pressure, in. H_2O

PMR = Particulate mass rate, lb/Hr

Q_a = Volumetric flow rate ACFM

Q_s = Volumetric flow rate SDCFM

V_s = Average stack gas velocity, ft/sec

V_{lc} = Total volume of liquid collected in impingers & silica gel, ml

V_m = Volume of gas sample as measured by dry gas meter, ACF

$V_{m(std)}$ = Volume of gas sample measured by dry gas meter, corrected to standard conditions, SDCF

$V_{w(std)}$ = Volume of water vapor in gas sample, corrected to standard conditions, SCF

V_n = Volume collected at stack conditions through nozzle, ACF

Y = Dry gas meter calibration factor (dimensionless)

ΔH = Average pressure difference of orifice, in. H_2O

ΔP = Velocity head of stack gas, in. H_2O

$\overline{\sqrt{\Delta P}}$ = Average of square roots of the velocity pressure, in. H_2O

Ø = Total sampling time, minutes

$\%CO_2$, $\%O_2$, N_2, %CO - Number % by volume, dry basis, from gas analysis

F_{O_2} = Oxygen based F factor (9820 SDCF/mmBTU for bituminous coal)

T_s = Temperature of the stack, °R (° F + 460)

113MW

SANDERS ENGINEERING & ANALYTICAL SERVICES, Inc.

1568 Leroy Stevens Rd.
Mobile, AL 36695

Office: (205) 633-4120
FAX#: (205) 633-2285

FIELD DATA SHEET

COMPANY Gulf Power Co
DATE 5-7-96
METER BOX S-100
PLANT/(UNIT) Smith
OPERATOR JC
ΔHa .75 cu. ft. /min.
LOCATION #1 Soot Blowing
METHOD 17
PROBE 12' liner/length

RUN 1 SB

NOZZLE CALIBRATION

PRE	POST
.219	.219
.219	.219
.220	.219
.219	.219
AVERAGE	AVERAGE

NOMOGRAPH

Km	Tm
Noz	Ts
H2O	PsPm

FILTER

1381

METER READING

145.150	
FINAL	FINAL
80.000	
INITIAL	INITIAL
65.150	
NET	NET

LEAK CHECK

SYSTEM Pre	SYSTEM Post	PITOT Pre	PITOT Post
✓ in. Hg	22 in. Hg	☑ impact	☑ impact
✓ cfm	.010 cfm	☑ static	☑ static

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	212	106	0	1697.0
INITIAL	100	100	0	1678.5
NET	112	6	0	18.5

TOTAL 136.5

GAS ANALYSIS

O_2 8.1
CO_2 11.0
CO

STATIC

+1.20 in. H_2O

BAROMETRIC

30.31 in. Hg

RUN 2

NOZZLE CALIBRATION

PRE	POST
.234	234
.234	234
.234	234
.234	234
AVERAGE	AVERAGE

FILTER

1382

METER READING

120.140	
FINAL	FINAL
46.700	
INITIAL	INITIAL
73.440	
NET	NET

LEAK CHECK

SYSTEM Pre	SYSTEM Post	PITOT Pre	PITOT Post
✓ in. Hg	17 in. Hg	☐ impact	☑ impact
✓ cfm	.002 cfm	☐ static	☑ static

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	221	100	0	1490.0
INITIAL	100	100	0	1479.5
NET	121	0	0	10.5

TOTAL 131.5

GAS ANALYSIS

O_2 7.8
CO_2 12.5
CO

STATIC

1.20 in. H_2O

BAROMETRIC

30.31 in. Hg

RUN 3

NOZZLE CALIBRATION

PRE	POST
242	.242
243	.243
244	.244
.243	.243
AVERAGE	AVERAGE

FILTER

1383

METER READING

103.930	
FINAL	FINAL
22.500	
INITIAL	INITIAL
81.430	
NET	NET

LEAK CHECK

SYSTEM Pre	SYSTEM Post	PITOT Pre	PITOT Post
✓ in. Hg	20 in. Hg	☑ impact	☑ impact
✓ cfm	.010 cfm	☑ static	☑ static

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	242	100	0	1706.0
INITIAL	100	100	0	1697.0
NET	142	0	0	9.0

TOTAL 151.0

GAS ANALYSIS

O_2 7.1
CO_2 12.0
CO

STATIC

1.20 in. H_2O

BAROMETRIC

30.31 in. Hg

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)						Vac. in. H_g
					Stack	~~Probe~~	Hot ~~Box~~	Imp.	Gas Meter		
									In	Out	
1-1	7:12	80.000	.35	.50	318			66	74	73	0
2	:14	80.900	.24	.34	318			66	74	73	0
3	:16	81.700	.32	.45	319			✓	74	73	2
4	:18	82.400	.56	.79	320			✓	74	73	3
5	:20	83.400	.90	1.28	320			✓	76	73	4
6	:22	84.700	1.48	2.10	320			✓	78	73	6
2-1	7:25	86.350	~~.30~~ 32	.45	318			66	78	73	3
2	:27	87.000	.32	.45	319			✓	78	73	2
3	:29	87.900	.32	.45	320			✓	78	73	2
4	:31	88.600	.42	.59	320			✓	78	74	3
5	:33	89.400	.78	1.11	320			✓	78	74	3
6	:35	90.600	1.66	2.35	320			✓	78	74	7
3-1	7:37	92.300	.28	.40	319			59	79	74	2
2	:39	93.300	.30	.43	320			✓	79	74	2
3	:41	93.800	.39	.55	321			✓	79	74	3
4	:43	94.600	.49	.69	321			✓	79	74	3
5	:45	95.500	.66	.94	322			✓	79	74	4
6	:47	96.500	1.00	1.42	322			✓	80	75	5
4-1	7:50	97.900	.20	.28	319			60	80	75	3
2	:52	98.800	.30	.43	320			✓	80	75	3
3	:54	99.700	.63	.89	322			✓	80	76	4
4	:56	100.6	1.08	1.53	323			✓	80	76	6
5	:58	101.600	.97	1.37	323			✓	80	76	6
6	8:00	103.100	.86	1.22	322			✓	80	76	5
5-1	8:02	104.100	.40	.57	323			60	81	76	3
2	:04	104.900	.~~91~~ 85	~~1.30~~ 1.22	323			✓	81	78	3
3	:06	106.000	1.04	1.49	324			✓	81	78	5
4	:08	107.450	1.15	1.64	324			✓	81	76	6
5	:10	109.100	.86	1.23	324			✓	81	76	5
6	:12	110.100	.66	.94	324			✓	81	76	5
7-1	8:30	111.230	.75	1.07	307			✓	81	76	2
2	:32	112.200	.66	.94	308			✓	81	76	2

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co Date 5-7-96

Site Smith #1 Run # 1 SB Page ____ Of ____

Port #		Gas Meter Vol.	Vel. Head ΔP	Orifice Head ΔH	Temperature (F)						Vac.
							Hot		Gas Meter		in. H_g
Point #	Time	(cu. ft.)	in. H_2O	in. H_2O	Stack	~~Probe~~	~~Box~~	Imp.	In	Out	
7-3	8:34	113.500	.76	1.08	310			63	82	79	5
4	:36	114.400	.67	.96	310			63	82	79	5
5	:38	115.900	.58	.83	309			✓	82	79	4
6	:40	116.700	.54	.77	307			62	82	79	4
7-1	8:43	117.900	.73	1.04	309			✓	82	79	4
2	:45	118.900	.72	1.03	309			✓	82	79	5
3	:47	119.900	.76	1.09	309			✓	85	79	5
4	:49	121.300	.64	.93	309			✓	85	79	5
5	:51	122.200	.60	.87	309			✓	85	79	5
6	:53	123.300	.39	.56	309			✓	85	79	4
8-1	:56	124.300	.91	1.32	309			60	85	80	6
2	:58	125.500	.58	.84	309			✓	85	80	6
3	9:00	126.500	.74	1.07	309			✓	85	80	6
4	:02	128.000	.67	.97	310			✓	85	80	5
5	:04	128.950	.67	.97	310			✓	86	81	5
6	:06	130.100	.88	1.27	310			✓	86	81	5
9-1	9:09	131.300	.73	1.06	309			62	86	81	5
2	:11	132.400	.74	1.07	310			✓	86	81	5
3	:13	133.900	.67	.97	310			✓	86	81	5
4	:15	134.700	.72	1.04	~~308~~ 310			✓	86	81	5
5	:17	135.900	.63	.91	~~306~~ 310			✓	86	81	5
6	:19	136.900	.58	.84	311			✓	87	82	5
10-1	:22	137.900	.52	.75	311			✓	87	82	5
2	:24	138.900	.90	1.31	311			✓	87	82	5
3	:26	140.100	.85	1.23	311			✓	87	82	5
4	:28	141.200	.96	1.39	311			✓	87	82	6
5	:30	142.600	.94	~~1.39~~ 1.36	311			✓	87	82	7
6	:32	144.000	1.00	1.45	311			✓	87	82	7
	:34	145.150									

Check Indicates Temperatures Meet Required Limits.

75.5083

Company Gulf Power Co Date 5-7-56

Site Sm-11 #1 Run # 1 Page ____ Of ____

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)						Vac. in. H_g
					Stack	~~Probe~~	Hot ~~Box~~	Imp.	Gas Meter In	Gas Meter Out	
1-1	10:38	46.700	.32	.60	325			✓	85	85	4
2	:40	47.750	.26	.45	328			~~✓~~66	85	85	4
3	:42	48.500	.24	.45	328			✓	85	85	3
4	:44	49.200	.58	1.10	330			✓	85	85	5
5	:46	50.600	1.18	2.27	330			✓	88	85	5
6	:48	51.850	1.52	2.88	330			✓	88	85	10
2-1	11:51	53.600	.28	.53	327			56	89	85	3
2	:53	54.700	.30	.56	329			✓	89	85	4
3	:55	55.500	.31	.58	329			✓	89	85	4
4	:57	56.300	.48	.90	329			✓	90	86	4
5	:59	57.300	.76	1.43	330			✓	90	86	5
6	11:01	58.300	1.80	3.38	330			✓	90	86	5
3-1	11:03	59.550	.18	.34	328			52	90	88	6
2	:05	60.300	.28	.53	330			✓	90	86	3
3	:07	61.200	.50	.94	330			✓	90	86	5
4	:09	62.700	.60	1.13	331			✓	90	86	5
5	:11	63.500	.73	1.37	331			✓	90	86	5
6	:13	64.700	.96	1.80	331			✓	90	86	7
4-1	11:17	66.000	.22	.41	331			52 ✓	92	87	4
2	19	66.880	.24	.45	332			✓	92	67	4
3	21	67.600	.76	1.42	~~330~~ 331			✓	92	87	6
4	23	68.900	1.12	2.10	331			✓	92	87	9
5	25	70.400	1.15	2.15	331			✓	92	87	9
6	27	72.050	.84	1.57	331			✓	92	87	5
5-1	11:25	73.600	.44	.82	331			52	92	87	5
2	:31	74.850	.62	1.16	332			✓	92	87	5
3	:33	75.700	1.25	2.34	333			✓	92	87	10
4	:35	77.400	1.27	2.38	334			✓	92	87	10
5	:37	78.500	.82	1.53	334			✓	92	87	10
6	:39	80.200	.58	1.08	332			✓	92	87	10
7-1	11:43	81.400	.76	1.43	312			57	93	88	7
2	:45	83.000	.63	1.18	312			✓	93	88	7

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co Date 5-7-96

Site #1 Soot Blowing Run # SB#2 Page ____ Of ____

Port #		Gas Meter Vol.	Vel. Head ΔP	Orifice Head ΔH	Temperature (F)						Vac.
									Gas Meter		
Point #	Time	(cu. ft.)	in. H_2O	in. H_2O	Stack	Probe	Hot Box	Imp.	In	Out	in. H_g
7-3	11:47	83.900	.67	1.26	312			57	94	88	7
4	:49	85.200	.67	1.26	312			✓	94	88	7
5	:51	86.300	.30	.58	313			✓	94	88	7
6	:53	87.600	.67	1.29	311			✓	94	88	7
8-1	11:56	88.500	.79	1.52	313			✓	93	89	8
2	58	89.700	.53	1.02	312			✓	93	89	7
3	12:00	91.100	.82	1.57	313			✓	93	89	8
4	:02	92.700	.87	1.67	313			✓	93	89	8
5	:04	93.750	.80	1.54	314			✓	93	89	8
6	:06	95.000	.96	1.84	313			✓	95	89	8
8-1	12:08	96.700	.88	1.69	313			✓	95	89	8
2	:10	98.200	.30	.58	313			✓	95	89	8
3	:12	99.700	.72	1.38	313			✓	94	89	5
4	:14	100.600	.97	1.86	314			✓	94	89	8
5	:16	101.300	.74	1.43	314			✓	94	87	8
6	:18	102.900	.90	1.73	314			✓	94	89	8
9-1	12:22	103.850	.67	1.29	313			✓	94	89	7
2	:24	104.800	.63	1.21	313			✓	94	89	7
3	:26	106.500	.58 ~~.63~~	1.11	313			✓	94	89	7
4	:28	107.600	.56	1.07	314			✓	94	89	7
5	:30	108.900	.67	1.25	315			✓	94	89	7
6	:32	110.000	.76	1.46	314			✓	94	89	8
10-1	12:35	111.250	.92	1.77	313			✓	94	89	8
2	:37	112.700	1.10	2.11	314			✓	94	89	8
3	:39	114.300	1.06	2.04	332			✓	94	89	10
4	:41	115.500	1.06	2.04	332			✓	94	89	10
5	:43	117.200	.83	1.59	332			✓	94	89	10
6	:45	118.600	.96	1.84	332			✓	94	89	10
	12:47	120.140									

8265

Check Indicates Temperatures Meet Required Limits.

Company G.P. Bwor Co

Date 5-7-96

Site

Run # 2

Page

Of

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)						Vac. in. H_g
					Stack	~~Probe~~	~~Hot Box~~	Imp.	Gas Meter In	Gas Meter Out	
1-1	14:02	22.500	.18	.40	329			67	90	90	4
2	:04	23.300	.16	.35	330			✓	90	90	5
3	:06	24.300	.34	.94	330			✓	90	90	6
4	:08	25.100	~~.34~~ .60	1.31	332			✓	90	90	7
5	:10	26.900	.96	2.10	332			✓	90	90	9
6	:12	27.900	1.37	3.00	332			✓	92	90	9
2-1	14:14	29.200	.92	2.01	331			59	92	89	7
2	:16	30.800	.25	.54	330			✓	92	89	5
3	:18	31.700	.31	.67	332			✓	92	89	5
4	:20	32.700	~~.43~~ .48	~~.94~~ 1.05	332			✓	92	89	6
5	:22	33.700	.86	1.89	332			✓	92	89	9
6	:24	35.100	1.87	4.09	332			✓	92	89	13
3-1	14:27	37.100	.24	.53	330			✓56	93	89	6
2	:29	38.300	.28	.61	331			✓	93	89	6
3	:31	39.200	.40	.87	331			✓	93	89	6
4	:33	40.200	.62	1.36	331			✓	93	89	6
5	:35	41.200	.72	1.57	331			✓	93	89	6
6	:37	42.500	1.02	2.23	331			✓	93	89	6
4-1	14:40	44.200	.32	.70	333			✓	93	89	5
2	:42	45.200	.30	.65	333			✓	94	89	5
3	:44	45.900	.94	2.06	333			✓	94	89	5
4	:46	47.700	1.20	2.63	334			✓	94	89	5
5	:48	49.400	1.11	2.43	334			✓	94	89	5
6	:50	51.100	.82	1.80	334			✓	94	89	5
5-1	14:52	52.450	.62	1.35	334			✓	94	89	8
2	:54	53.600	.65	1.42	334			✓	94	89	8
3	:56	55.100	.88	1.92	335			✓	94	89	8
4	:58	56.200	1.00	2.20	335			✓	94	89	11
5	15:00	57.900	.82	1.79	335			✓	94	89	11
6	:02	59.500	.51	1.12	334			✓	94	89	7
7-1	15:06	60.700	.74	1.62	313			✓	94	89	8
2	:08	62.200	.62	1.37	312			✓	94	89	8

Check Indicates Temperatures Meet Required Limits.

Company G&E Power Co Date 5-7-96

Site Smith Unit 1 Soot Blowing Run # 3 Page 3 S.B Of

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)						Vac. in. H_g
					Stack	Probe	Hot Box	Imp.	Gas Meter In	Gas Meter Out	
7-3	15:10	63.500	.58	1.30	313			64	95	90	8
4	:12	64.800	.72	1.61	313			✓	95	90	8
5	:14	66.300	.24	.53	313			✓	95	90	5
6	:16	67.100	.74	1.65	310			✓	95	90	9
8-1	15:19	68.400	.39	.87	313			✓62	94	90	6
2	:21	69.600	.77	1.73	313			✓	94	90	8
3	:23	71.100	.83	1.83	313			✓	94	90	8
4	:25	72.200	.77	1.73	313			✓	94	90	8
5	:27	73.600	.77	1.73	313			✓	94	90	10
6	:29	75.000	.72	1.61	313			✓	94	90	10
9-1	15:32	76.600	.87	1.95	313			✓60	94	90	10
2	:34	78.100	.72	1.61	313			✓	94	90	10
3	:36	79.700	.72	1.61	313			✓	94	90	11
4	:38	81.000	.72	1.61	313			✓	94	90	11
5	:40	82.500	.69	1.54	313			✓	94	90	10
6	:42	83.700	.70	1.57	313			✓	94	90	10
9-1	15:44	85.400	.90	2.01	312			✓62	94	90	11
2	:46	87.100	.88	1.97	312			✓	94	90	11
3	:48	88.600	.95	2.13	313			✓	94	90	11
4	:50	90.400	.72	1.61	314			✓	95	90	12
5	:52	91.300	.72	1.61	314			✓	95	90	10
6	:54	93.000	.73	1.63	315			62	95	90	10
10-1	15:57	94.450	~~.72~~ 1.15	~~1.61~~ 2.58	315			✓	95	90	9
2	:59	95.900	1.06	2.37	315			✓	95	90	12
3	16:01	98.100	1.12	2.51	315			✓	95	90	13
4	:03	99.800	.94	2.10	314			✓	95	90	12
5	:05	101.100	.98	2.19	314			✓	95	90	12
6	:07	102.400	.92	2.06	315			✓62	95	90	12
	16:05	103.930									

.8313

Check Indicates Temperatures Meet Required Limits.

Company G/E Power Co Date 5-7-96

Site Unit 1 Small Stack Bldg Run # Run 3 S.B Page ______ Of ____

LABORATORY ANALYSIS & CHAIN OF CUSTODY

COMPANY/PLANT: Gulf Power - Plant Smith

UNIT #: 1 DATE OF TEST: 5-7-96 TYPE OF TEST: ☐ M-5 ☒ M-17 ☐ OTHER

SAMPLE #	RELINQUISHED BY	RECEIVED BY	TIME	DATE	REASON FOR CHANGE
3 Filters			PM	5-13-96	To Lab
3 Wash					No change

UNIT # 1 - Soot Blowing

RUN # 1	FILTER # 1381	BEAKER # 3 WASH (ML) 30
FINAL WEIGHT	146.6	64481.5
INITIAL WEIGHT	121.2	64478.6
DIFFERENCE	25.4	2.9
CORRECTED TOTAL WEIGHT		28.3
RUN # 2	FILTER # 1382	BEAKER # 27 WASH (ML) 35
FINAL WEIGHT	167.6	68106.6
INITIAL WEIGHT	123.1	68102.3
DIFFERENCE	44.5	4.3
CORRECTED TOTAL WEIGHT		48.8
RUN # 3	FILTER # 1383	BEAKER # 36 WASH (ML) 40
FINAL WEIGHT	155.5	67936.6
INITIAL WEIGHT	121.5	67932.9
DIFFERENCE	34.0	3.7
CORRECTED TOTAL WEIGHT		37.7
RUN #	FILTER #	BEAKER # WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		

UNIT #

RUN #	FILTER #	BEAKER # WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
RUN #	FILTER #	BEAKER # WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
RUN #	FILTER #	BEAKER # WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
WASH SOLVENT BLANK (ML)		BEAKER # WASH (ML)
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTION FACTOR (MG/ML)		

ALL WEIGHTS ARE IN MILLIGRAMS (MG)

APPENDIX B SAMPLE CALCULATIONS

Input and Constants

```
                3
     9820 ft
f := --------
      mm btu

pg := 1.2 in. H2O

pbar := 30.31 in. Hg.

Δhavg := 0.98 in. H2O

y := 1.038

tm := 79.5 °F

o2 := 8.1

co2 := 11.

                  3
vm := 65.15 ft

vlc := 136. ml

theta := 120 min

nozdia := 0.219 in.

ts := 315.2 °F

                   2
as := 210.88 ft

mn := 28.3 mg

numberofpoints := 60

                           0.5
sqrtΔp := 0.8114 in. H2O

                           lb in. Hg.     0.5
      85.49 1 ft 1 (------------------)
                       lb-mole °R in. H2O
kp := ------------------------------------
                         1 sec

cp := 0.84

      17.64 °R
k1 := --------
      in. Hg.
```

$$ts = \frac{(ts + 460\ °F)\ °R}{°F}$$

775.2 °R

$$tm = \frac{(tm + 460\ °F)\ °R}{°F}$$

539.5 °R

$$n2 = 100 - o2 - co2$$

80.9

$$an = \frac{nozdia^{2}\ \ 3.1416}{4\left(\frac{12\ in.}{ft}\right)^{2}}$$

$0.000261587\ ft^{2}$

Calculations

Equation 1

$$ps = pbar + \frac{pg}{\dfrac{13.6 \text{ in. } H_2O}{1 \text{ in. Hg.}}}$$

30.3982 in. Hg.

Equation 2

$$pm = pbar + \frac{\Delta havg}{\dfrac{13.6 \text{ in. } H_2O}{\text{in. Hg.}}}$$

30.3821 in. Hg.

Equation 3

$$vmstd = \frac{k1\ vm\ y\ \left(pbar + \dfrac{\Delta havg}{\dfrac{13.6 \text{ in. } H_2O}{\text{in. Hg.}}}\right)}{tm}$$

67.1794 ft^3

Equation 4

$$vwstd = \frac{0.04707 \text{ ft}^3\ vlc}{ml}$$

6.40152 ft^3

Equation 5

$$bws = \frac{vwstd}{vmstd + vwstd}$$

0.0869997

Equation 6

$$md = \frac{(0.44\ co2 + 0.32\ o2 + 0.28\ n2)\ lb}{lb\text{-}mole}$$

$$\frac{30.084\ lb}{lb\text{-}mole}$$

Equation 7

$$ms = md\ (1 - bws) + \frac{bws\ 18\ lb}{lb\text{-}mole}$$

$$\frac{29.0327\ lb}{lb\text{-}mole}$$

Equation 8

$$vs = kp\ cp\ sqrt\Delta p\ \left(\frac{ts}{ms\ ps}\right)^{0.5}$$

$$\frac{54.6096\ ft}{sec}$$

Equation 9

$$qa = \frac{vs\ as\ 60\ sec}{min}$$

$$\frac{690964.\ ft^{3}}{min}$$

Equation 10

$$qs = \frac{qa\ (1 - bws)\ 528\ {}^{\circ}R\ ps}{ts\ 29.92\ in.\ Hg.}$$

$$\frac{436549.\ ft^{3}}{min}$$

Equation 11

$$cs = \frac{0.0154\ gr\ mn}{mg\ vmstd}$$

$$\frac{0.00648741\ gr}{ft^{3}}$$

Equation 12

$$pmr = \frac{cs\ qs\ 60\ min}{hour\ \frac{7000\ gr}{lb}}$$

$$\frac{24.2749\ lb}{hour}$$

Equation 13

$$e = \frac{cs\ f\ 20.9\ 1\ lb}{(20.9 - o2)\ 7000\ gr}$$

$$\frac{0.0148601\ lb}{mm\ btu}$$

Equation 14

$$vn = \frac{ts\ \left(\frac{0.002669\ in.\ Hg.\ ft^{3}\ vlc}{ml\ {}^{\circ}R} + \frac{vm\ y\ pm}{tm}\right)}{ps}$$

$$106.375\ ft^{3}$$

Equation 15

$$i = \frac{100\ \%\ vn}{\dfrac{60\ sec\ theta\ vs\ an}{min}}$$

103.424 %

Equation 16

$$hi = \frac{pmr}{e}$$

$$\frac{1633.57\ mm\ btu}{hour}$$

APPENDIX C QUALITY CONTROL

INITIAL
METER CALIBRATION FORM - DGM

DATE: 12-10-95 Box No. S-100

Ref. DGM Ser. # 1044453 Calibrated By JACK COVINGTON

RUN #	1	2	3	4	5
DELTA H (DGM)	0.50	1.00	1.50	2.00	3.00
Y (Ref. DGM)	1.014	1.014	1.014	1.014	1.014
Reference DGM					
Gas Vol. Initial	10.000	16.400	22.000	28.500	34.600
Gas Vol. Final	15.800	21.600	28.000	34.000	40.800
Meter Box DGM					
Gas Vol. Initial	90.495	96.775	102.265	108.630	114.610
Gas Vol. Final	96.195	101.880	108.140	114.015	120.650
Reference DGM					
Temp.	Avg.	Avg.	Avg.	Avg.	Avg.
Deg F Initial	68	69	68	69	70
Deg F Final	69	68	69	70	69
Meter Box DGM					
Temp. Initial In	68	72	75	78	79
Temp. Initial Out	66	68	69	71	71
Temp. Final In	72	75	77	79	80
Temp. Final Out	68	69	70	71	72
P Bar IN. Hg	30.08	30.08	30.08	30.08	30.08
Time (sec.)	849	549	524	418	390
Meter Calibration Factor (Y)	1.031	1.035	1.040	1.041	1.045
Qm (C.F.M.)	0.418	0.579	0.700	0.803	0.970
Km (Std Pressure)	0.759	0.743	0.733	0.727	0.717
DELTA Ha	1.62	1.68	1.72	1.74	1.78
Average Y (Meter Calibration Factor				1.038	
Average Km (Standard Pressure)				0.736	
Average DELTA Ha of Orifice				1.706	

Y= ≤ .03
Max & Min ≤ .02 from Avg
Final Avg within 5% of Initial Avg
ΔHa = Max & Min ≤ .2 from Avg

POST TEST QUALITY ASSURANCE

Date: 5/16/96

BOX #: **S-100**

Ref. Meter: 1044453

Calibrated By: **JACK COVINGTON**

DIFFERENTIAL PRESSURE GAUGE

Ref. Pressure in H_2O	Magnehelic Pressure in H_2O	Percent Error (+/- 5%)
0.00	0.00	0
0.75	0.76	1.333333333
0.39	0.39	0

DRY GAS METER

	Unit	Run 1	Run 2	Run 3
FIELD METER ΔH	In. H_2O	1.50	1.50	1.50
Initial Gas Volume	Ft.^{3}	56.400	61.700	69.000
Final Gas Volume	Ft.^{3}	61.700	69.000	120.155
Initial Temp. In	°F	76	76	76
Initial Temp. Out	°F	76	77	78
Final Temp. In	°F	73	73	73
Final Temp. Out	°F	72	72	72
REF. METER Y	*Dimensionless*	1.014	1.014	1.014
Initial Gas Volume	Ft.^{3}	18.540	23.788	31.040
Final Gas Volume	Ft.^{3}	23.788	31.040	81.700
Initial Temp.	°F	77	85	91
Final Temp.	°F	73	79	85
Barometric Pressure	In. Hg	30.01	30.01	30.01
Time	sec	465	644	4502
Meter Calibration Factor	*Dimensionless*	0.999	0.990	0.976
ΔH_a	In. H_2O	1.801	1.855	1.898
Average Y	*Dimensionless*	0.988		
Initial Y	*Dimensionless*	1.038		
Percent Error	%	-4.8	*(Allowed 5.0%)*	

TEMPERATURE SENSOR

Ref. Temp. (°F)	Thermocouple Temp. (°F)	Percent Error (Allowed 1.5% of Absolute)
280	279	-0.14

ARENOID BAROMETER

Reference Barometer	Test Barometer	0.1 Diff. Allowed
30.01	30.08	0.07

MAGEHELIC CALIBRATION

BOX	2879	S-100	C-133	C-175	S-102	S-101	S-103
SER. NO.		91126AM 91	9126A M91	R90125 MR6	R74D	R22D	R20208 A617
RANGE	0-2	0-2	0-2	0-2	0-5	0-2	0-2
REFERENCE READING	FIELD DEVICE READING						
0.000		0.00	0.00	0.00	0.00	0.00	0.00
0.050							
0.150							
0.200							
0.250							
0.450							
0.50	0.50	0.51	0.50	0.51	0.51	0.50	0.50
1.00	0.99	1.01	0.98	1.01	1.01	0.98	1.01
1.30							
1.80	1.80	1.82	1.79	1.82	1.81	1.79	1.82
2.50							
4.50							
5.0							
9.0							
13.0							
22.0							

SIGNATURE: Edward L. Harris

DATE: 12-5-95

MAGEHELIC CALIBRATION

BOX #1

SER. NO.	10720-AB68	R1061-6AG48	R5031-SEB76	R1062-9JA82	R1051-3MR42	R90124 RI119	
RANGE	0-0.25	0-0.50	0-2	0-5	0-10	0-25	
REFERENCE READING	FIELD DEVICE READING						
0.000	0.000	0.000	0.000	0.000	0.000	0.000	
0.050	0.050						
0.150	0.150	0.140					
0.200	0.190						
0.250		0.250					
0.450		0.450					
0.50			0.50				
1.00			1.00				
1.30				1.30			
1.80			1.80				
2.50				2.50	2.48		
4.50				4.50			
5.0					5.0	5.0	
9.0					9.02		
13.0						13.0	
22.0						22.0	

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION

BOX #2

SER. NO.	10819-DR2	R1090-2AG18	R50315-EB93	R1062-9TA87	30830-AM79	R1072-2MC5
RANGE	0-0.25	0-0.50	0-2	0-5	0-10	0-25
REFERENCE READING	FIELD DEVICE READING					
0.000	0.000	0.000	0.00	0.00	0.0	0.0
0.050	0.050					
0.150	0.155	0.152				
0.200	0.205					
0.250		0.256				
0.450		0.456				
0.50			0.52			
1.00			1.04			
1.30				1.32		
1.80			1.83			
2.50				2.55	2.49	
4.50				4.50		
5.0					4.9	5.2
9.0					8.8	
13.0						12.9
22.0						22.0

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION
BOX #3

SER. NO.	R10908AG71 MRR1	R0112642	R10608CF20 CF20
RANGE	0-0.50	0-2.0	0-10
REFERENCE READING	FIELD DEVICE READING		
0.000	0.00	0.00	0.0
0.050			
0.150	0.149		
0.200			
0.250	0.240		
0.450	0.450		
0.50		0.50	
1.00		0.98	
1.50			
1.80		1.78	
2.50			2.5
4.50			
5.0			5.0
9.0			9.0
13.0			
22.0			

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION

BOX #4

SER. NO.	R22D	R90051 6GT21	R90101 5CD102
RANGE	0-0.50	0-5	0-25
REFERENCE READING	FIELD DEVICE READING		
0.000	0.000	0.00	0.0
0.050			
0.150	0.151		
0.200			
0.250	0.251		
0.450	0.455		
0.50			
1.00			
1.30		1.27	
1.80			
2.50		2.52	
4.50		4.55	
5.0			5.0
9.0			
13.0			13.0
22.0			21.6

SIGNATURE: Edward L. Harris

DATE: 12/22/95

TEMPERATURE CALIBRATIONS - DEGREES FAHRENHEIT

REFERENCE DEVICE READING*	0 DEG. F	210 DEG.	420 DEG.	630 DEG.	840 DEG.	1050 DEG.	1260 DEG.	1470 DEG.	1680 DEG.	1900 DEG.
2879	0	217	421	630	839	1050	1260	1471	1681	1900
METER BOX #1 C-133 11580	0	212	423	635	842	1053	1264	1475	1679	1910
METER BOX #2 C-175 15962	0	211	423	627	839	1052	1265	1475	1687	1903
METER BOX #5 S-100 15751	2	211	417	628	844	1062	1279	1491	1698	1907
METER BOX #6 S-101 15751	0	210	419	628	839	1058	1255	1473	1691	1900
PORTABLE THERMOCOUPLE # 2 (Blue)	2	209	415	628	837	1053	1260	1468	1679	1908
PORTABLE THERMOCOUPLE # 2 (Green)	2	211	417	627	842	1058	1273	1484	1688	1896
PINK T140293	-1	208	415	624	840	1056	1272	1482	1687	1894
PORTABLE THERMOCOUPLE (Yellow)	0	210	419	632	840	1050	1259	1470	1680	1901
PORTABLE THERMOCOUPLE T-105998 (Black)	1	209	416	625	839	1055	1270	1481	1684	1891
METER BOX S-102	-2	209	417	625	837	1049	1259	1462	1658	1890
METER BOX S-103	4	215	423	632	844	1057	1266	1471	1667	1895

DATE: 12-05-95 **SIGNATURE:** Edward L. Harris

* Reference Device is an Omega Engineering CL505-A calibrated reference thermocouple-potentiometer system.

SANDERS ENGINEERING & ANALYTICAL SERVICES, Inc.

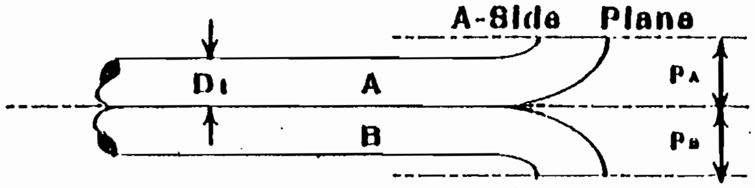
1565 Leroy Stevens Rd.
Mobile, AL 36605

Office: (205) 633-4120
FAX#: (205) 633-2205

The Pitot used was within the following geometric specifications:

Di between 0.48 and 0.95 cm (3/16 and 3/8 in.)

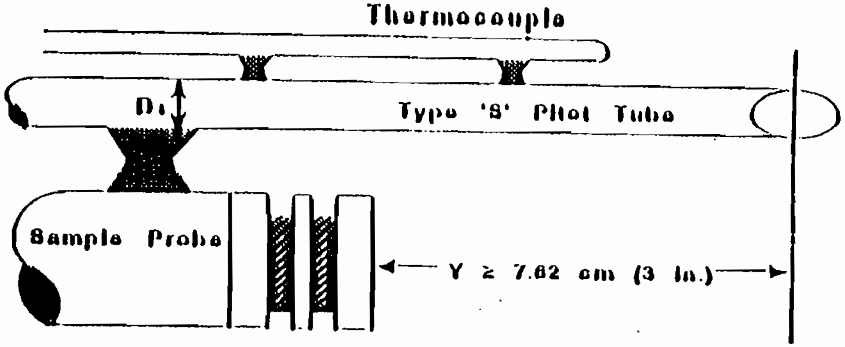
$C_p = 0.84$



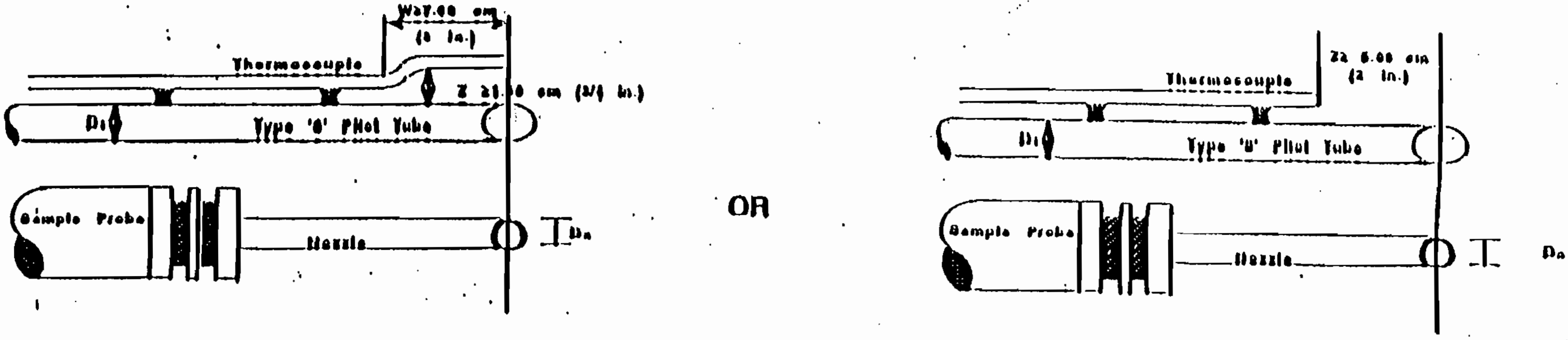
Note:

$1.05\ D_t \leq 1.50\ D_t$

$P_A = P_B$



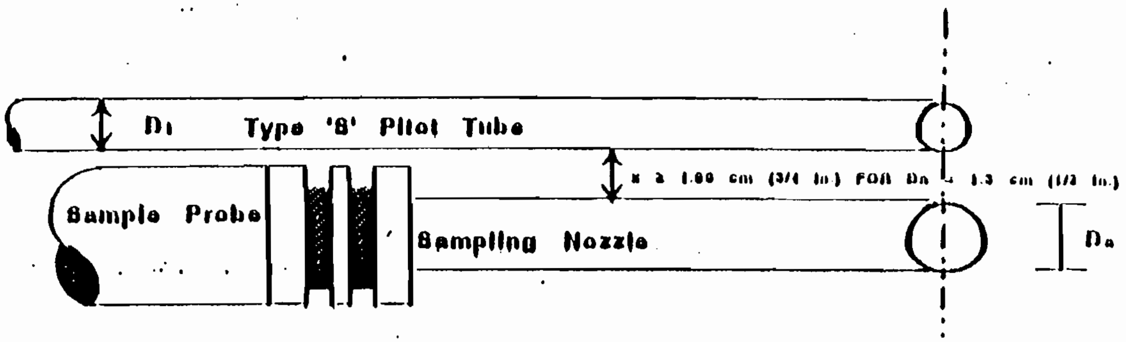
Minimum pitot-sample probe separation needed to prevent interference



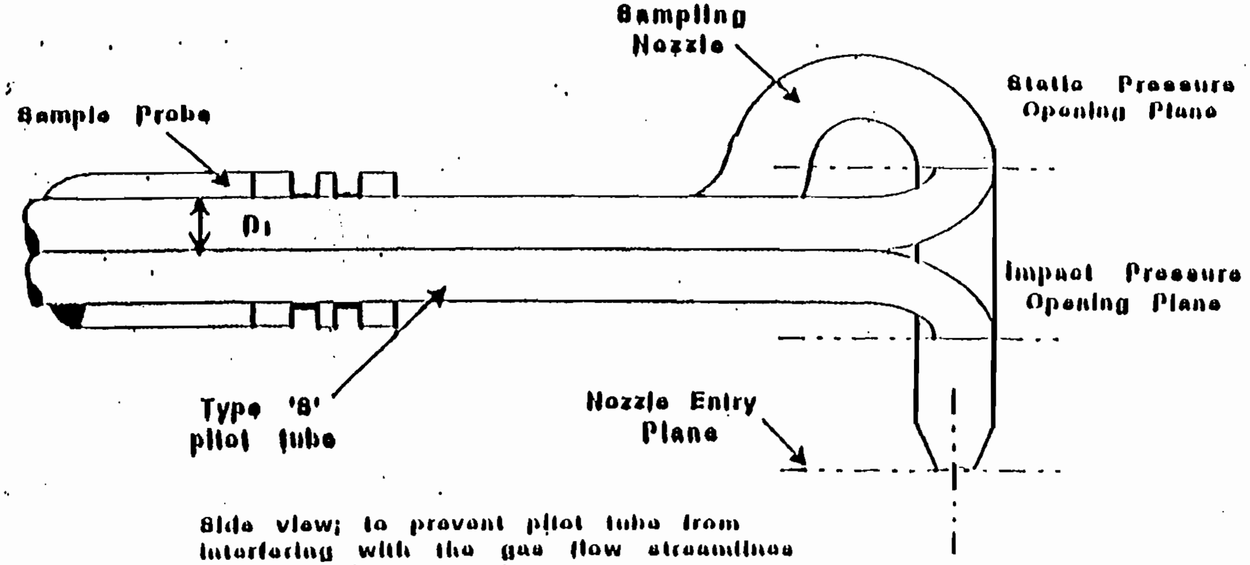
Proper thermocouple placement to prevent interference.

SANDERS ENGINEERING &
ANALYTICAL SERVICES, Inc.
1668 Leroy Stevens Rd.
Mobile, AL 36695
Office: (205) 633-4120
FAX#: (205) 633-2285

Proper pitot tube-sampling nozzel configuration to prevent aero-dynamic interference; buttonhook type nozzle; centers of nozzle and pitot opening aligned; Dt between 0.48 and 0.95 cm (3/16 and 3/8 in.)



Bottom view showing minimum pitot/nozzle separation



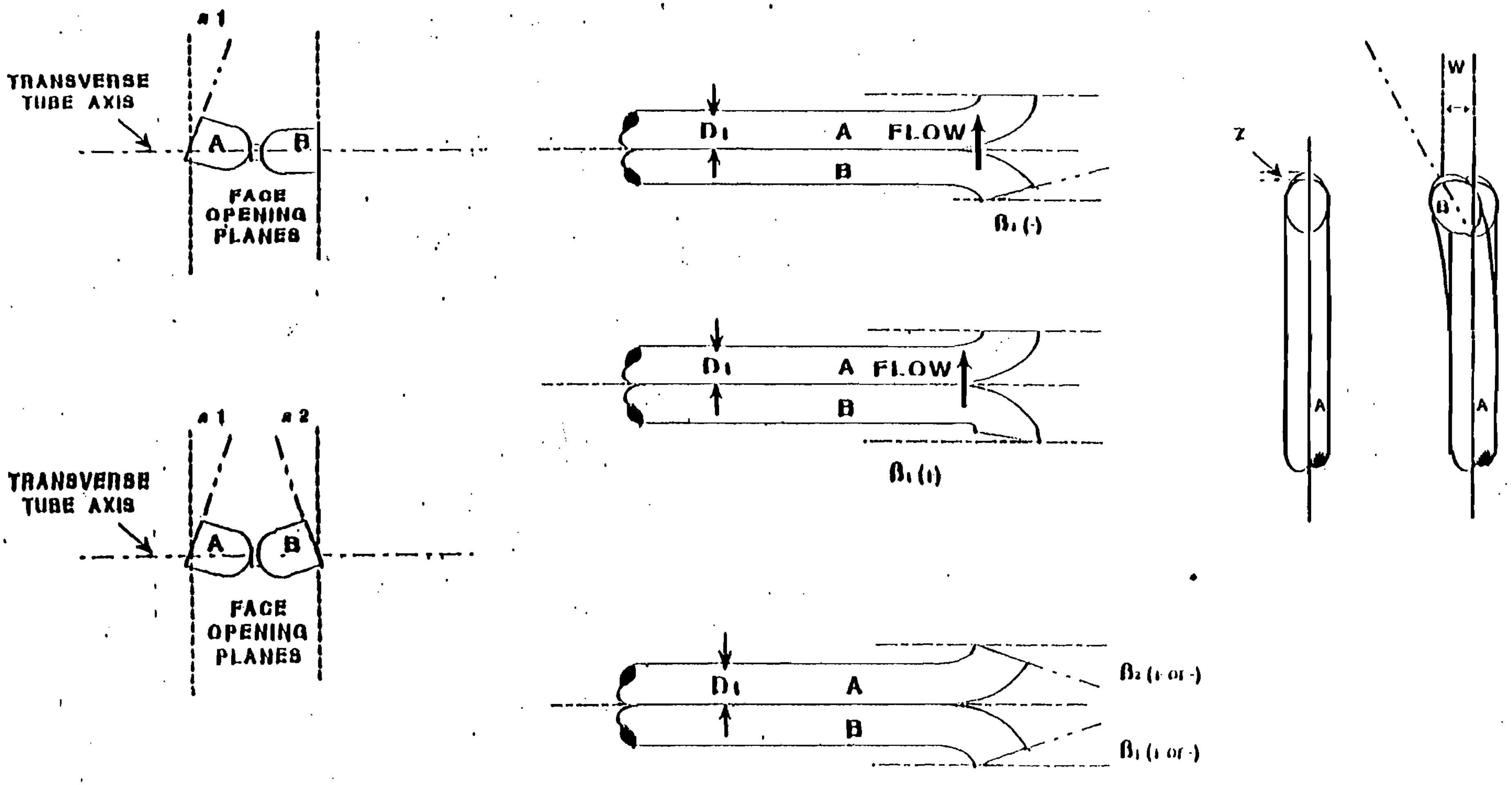
Side view; to prevent pitot tube from interfering with the gas flow streamlines approaching the nozzle, the impact pressure opening plane of the pitot tube shall be even with or above the nozzle entry plane.

SANDERS ENGINEERING & ANALYTICAL SERVICES, Inc.

1568 Leroy Stevens Rd.
Mobile, AL 36695

Office: (205) 633-4120
FAX#: (205) 633-2285

Types of face-opening misalignment that can result from field use or improper construction of type 'S' pitot tubes. These will not affect the baseline value of Cp(s) so long as α_1 and $\alpha_2 < 10°$, β_1 and $\beta_2 < 5°$, $z \leq$ 0.32 cm (1/8 in.)



APPENDIX D OPERATIONAL DATA

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST CHRONOLOGY
UNIT # 1
SOOTBLOWING CONDITIONS
May 7, 1996

RUN # 1	START	7:12 a.m.	No problems noted at beginning of run.
	STOP	9:34 a.m.	No problems noted at end of run.
RUN # 2	START	10:38 a.m.	No problems noted at beginning of run.
	STOP	12:47 a.m.	No problems noted at end of run.
RUN # 3	START	2:02 p.m.	No problems noted at beginning of run.
	STOP	4:09 p.m.	No problems noted at end of run.

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 1
SOOT BLOWING CONDITIONS
May 7, 1996

TIME OF 6 MIN. AVERAGE	OPACITY (%)
(RUN # 1)	(RUN # 1)
7:12 - 7:18	3.6
7:19 - 7:24	3.4
7:25 - 7:30	2.8
7:31 - 7:36	10.5
7:37 - 7:42	2.9
7:43 - 7:48	3.5
7:49 - 7:54	3.1
7:55 - 8:00	2.9
8:01 - 8:06	6.2
8:07 - 8:12	6.2
8:13 - 8:18	5.9
8:19 - 8:24	6.1
8:25 - 8:30	5.7
8:31 - 8:36	5.8
8:37 - 8:42	6.6
8:43 - 8:48	5.5
8:49 - 8:54	5.7
8:55 - 9:00	5.4
9:01 - 9:06	3.2
9:07 - 9:12	2.5
9:13 - 9:18	2.9
9:19 - 9:24	2.7
9:25 - 9:30	2.6
9:31 - 9:34	3.2
9:31 - 9:34	3.2

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 1
SOOT BLOWING CONDITIONS
May 7, 1996

(RUN # 2)	(RUN # 2)
10:38 - 10:42	3.4
10:43 - 10:48	3.7
10:49 - 10:54	3.7
10:55 - 11:00	3.6
11:01 - 11:06	3.8
11:07 - 11:12	3.3
11:13 - 11:18	3.9
11:19 - 11:24	3.6
11:25 - 11:30	3.7
11:31 - 11:36	3.7
11:37 - 11:42	3.2
11:43 - 11:48	3.6
11:49 - 11:54	3.4
11:55 - 12:00	3.6
12:01 - 12:06	3.9
12:07 - 12:12	3.2
12:13 - 12:18	3.7
12:19 - 12:24	3.9
12:25 - 12:30	3.6
12:31 - 12:36	4.0
12:37 - 12:42	3.6
12:43 - 12:47	4.0

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 1
SOOT BLOWING CONDITIONS
May 7, 1996

(RUN # 3)	(RUN # 3)
2:02 - 2:06	4.4
2:07 - 2:12	4.0
2:13 - 2:18	4.0
2:19 - 2:24	4.2
2:25 - 2:30	3.8
2:31 - 2:36	4.5
2:37 - 2:42	3.7
2:43 - 2:48	4.4
2:49 - 2:54	4.0
2:55 - 3:00	3.8
3:01 - 3:06	4.3
3:07 - 3:12	4.0
3:13 - 3:18	4.3
3:19 - 3:24	3.8
3:25 - 3:30	3.9
3:31 - 3:36	4.2
3:37 - 3:42	3.7
3:43 - 3:48	4.1
3:49 - 3:54	4.1
3:55 - 4:00	3.7
4:01 - 4:06	4.4
4:07 - 4:09	3.5

BEST AVAILABLE COPY

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT Lansing Smith

UNIT # 1

CONDITION: (circle one)

[✓ Sootblowing] Steadystate

RUN NUMBER: 1

Date: 5-7-96

0834

OPERATIONAL DATA FORM

RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS./HR.)					PERCENT O2			PERCENT OPACITY	I.D. FAN AMPS			
					A	B	C	D		A	B	EMS		1	2	3	4
1	0782	1.2 mil/PH	173MW	90,000 PPH	38000	35000	38000	39000		2.93	2.13		3.14	182	177		
2ND	0734	1.25 mil/PPH	173	90,000 PPH	38,000	34,000	39000	40,000		2.91	2.09		3.20	183	180		

COMMENTS:

START	END
A) 997170	A) 998074
B) 965262	B) 96[illegible]
C) 168501	C) 1[illegible]
D) 213931	D) 21[illegible]

GAS TEMP (F) AIR PREHEATERS				PULVERIZER MILLS TEMPERATURES				
1	2	3	4	1	2	3	4	5
311	339			145	150	1[illegible]	150	

PCT ATTACHMENT

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT Lansing Smith

UNIT # 1

CONDITION: (circle one)

[✓ Sootblowing] Steadystate

RUN NUMBER: 2

Date: 5·7·96

OPERATIONAL DATA FORM

RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS/HR.)					East PERCENT O2 West			PERCENT OPACITY	I.D. FAN AMPS			
										A	B	EMS		1 A	B	3	4
2	1038	1.23 mil PPH	173	89000	38000	34000	37,000	41,000		N/A	2.21		4.90	183	181		
	1247																

COMMENTS:

START	END
A) 998151	A) 999331
B) 966171	B) 967259
C) 119383	C) 170440
D): 214296	D) 216054

GAS TEMP (F) AIR PREHEATERS				PULVERIZER MILLS TEMPERATURES				
1	2	3	4	1	2	3	4	5
312	342			142	151	151	147	

PCT ATTACHMENT

Best Available Copy

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT Lansing Smith

UNIT # 1

CONDITION: (circle one)

[✓ Sootblowing] Steadystate

RUN NUMBER: 3

Date: 5-7-96

OPERATIONAL DATA FORM

RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS./HR.)					East	West PERCENT O2		PERCENT OPACITY	I.D. FAN AMPS			
					A	B	C	D		A	B	EMS		A 1	B 2	3	4
3	1402	1.2 MIL PPH	173	90,000 PPH	38000	34000	3600	39000		2.58	251		4.0	182	183		
END	1609																

COMMENTS:
START
A) 999801 000636
B) 967690 938957
C) 170840 171605
D) 217514 217331

GAS TEMP (F) AIR PREHEATERS				PULVERIZER MILLS TEMPERATURES				
A 1	B 2	3	4	A 1	B 2	C 3	D 4	5
318	348			145	151	150	148	

PCT ATTACHMENT

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST
PLANT Smith
UNIT # 1
CONDITION: (circle one)
Sootblowing Steadystate
RUN NUMBER: ONE START
Date: 5-7-96

PRECIPITATOR READINGS

PRECIPITATOR CABINET LOCATION	PRIMARY AMPS IP	PRIMARY VOLTS VP	SECONDARY AMPS IS	SECONDARY VOLTS VS
Outlet Precip	28	13	180	33.8
Inlet Precip	105	425	790	40.4
CAB A	32	254	390	44.2
B	18	249	40	41.4
C	72	339	390	47.6
D	97	288	500	40.4
E	141	265	1050	41.7
F	78	263	820	42.0
G	118	281	910	22.2
H	114	288	1000	29.4
J	102	267	1000	25.0
K	109	303	1050	31.0
L	0	58	0	17.2
m	69	234	780	26.6

PCT ATTACHMENT "A"

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # 1 ONE

CONDITION: (circle one)

Sootblowing Steadystate

RUN NUMBER: #1 END

Date: 5-7-96

PRECIPITATOR READINGS

PRECIPITATOR CABINET LOCATION	PRIMARY AMPS	PRIMARY VOLTS	SECONDARY AMPS	SECONDARY VOLTS
OUTLeT Precip	28	15	190	34.5
inleT Precip	109	432	820	40.7
CAB A	47	261	350	46.4
B	6	265	150	41.0
C	75	326	630	47.0
D	68A	401	1130	45.4
E	134	258	1060	41.4
F	79	263	850	40.4
G	105	283	990	21.9
H	112	265	960	28.8
J	106	276	960	25.4
K	111	301	930	30.1
L	0	58	0	17.2
M	69	225	880	42.3

PCT ATTACHMENT "A"

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST
PLANT smith
UNIT # one
CONDITION: (circle one)
Sootblowing Steadystate
RUN NUMBER: #2 START
Date: 5-7-96

PRECIPITATOR READINGS

PRECIPITATOR CABINET LOCATION	PRIMARY AMPS	PRIMARY VOLTS	SECONDARY AMPS	SECONDARY VOLTS
outlet	27	15	180	34.5
inlet	108	427	820	40.7
A	55	274	160	43.2
B	21	290	120	43.9
C	68	290	780	46.1
D	109	387	510	42.6
E	136	254	910	43.6
F	72	279	770	42.3
G	118	279	980	21.9
H	107	280	990	29.4
J	105	276	968	25.4
K	118	310	920	31.6
L	0	58	0	17.2
M	68	243	600	26.6

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # ONE

CONDITION: (circle one)

Sootblowing Steadystate

RUN NUMBER: TWO #2 End

Date: 5-7-96

PRECIPITATOR READINGS

PRECIPITATOR CABINET LOCATION	PRIMARY AMPS	PRIMARY VOLTS	SECONDARY AMPS	SECONDARY VOLTS
OutLeT	27	15	190	34.5
InLeT	108	429	820	41.0
A	34	258	500	47.3
B	26	280	150	43.2
C	93	333	880	50.5
D	44	279	540	47.0
E	133	272	1100	41.4
F	83	272	850	41.7
G	105	274	920	22.3
H	101	281	1030	27.6
J	103	274	950	25.0
K	112	317	950	30.4
L	0	58	0	17.2
m	61	234	770	26.6

PCT ATTACHMENT "A"

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # ONE

CONDITION: (circle one)

Sootblowing Steadystate

RUN NUMBER: #3 START

Date: 5-7-96

PRECIPITATOR READINGS

PRECIPITATOR CABINET LOCATION	PRIMARY AMPS	PRIMARY VOLTS	SECONDARY AMPS	SECONDARY VOLTS
OUTLET	27	15	180	34.5
INLET	108	429	820	41.0
A	45	281	400	46.7
B	28	281	210	42.0
C	104	353	960	51.7
D	85	301	950	47.0
E	139	265	1060	41.7
F	74	252	720	42.0
G	122	281	880	21.6
H	105	267	960	28.5
J	103	265	1000	25.7
K	98	300	820	31.6
L	0	58	0	17.2
M	58	238	780	32.6

PCT ATTACHMENT "A"

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # 1

CONDITION: (circle one)

Sootblowing Steadystate

RUN NUMBER: # 3 END

Date: 5-7-96

PRECIPITATOR READINGS

PRECIPITATOR CABINET LOCATION	PRIMARY AMPS	PRIMARY VOLTS	SECONDARY AMPS	SECONDARY VOLTS
Outlet	28	15	180	34.5
Inlet	109	429	820	41.0
A	42	225	150	41.4
B	32	270	160	42.6
C	80	335	220	50.5
D	36	317	780	47.6
E	134	263	1000	42.0
F	83	283	750.	41.7
G	118	274	960	20.7
H	104	276	880	27.9
J	101	265	920	25.7
K	104	301	930	31.0
L	0	58	0	17.2
M	58	236	790	80.0

PCT ATTACHMENT "A"

Eus 6

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.

PARTICULATE EMISSIONS TEST REPORT
STEADY STATE OPERATIONS

FOR

GULF POWER COMPANY
Plant Smith, Unit 2
Panama City, Florida

May 10, 1996

1568 LEROY STEVENS ROAD
MOBILE, ALABAMA 36695 • 205/633-4120

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ILLUSTRATIONS

1. INTRODUCTION

Sanders Engineering & Analytical Services, Inc. (SEAS), performed particulate emissions testing at Gulf Power Company, Plant Smith, Unit 2, located in Panama City, Florida. The test was conducted on May 10, 1996, during steady state operations. The testing was performed in accordance with the applicable U.S. EPA procedures specified at **40 CFR, Part 60, Appendix A, Methods 1, 2, 3, 4, and 17**.

The purpose of the test was to demonstrate compliance with the rules and regulations of the Florida Department of Environmental Protection, and to meet certain requirements contained in the permit to operate issued by the Florida Department of Environmental Protection.

The test was conducted by Mr. Jack Covington, Mr. Dean Holmes, Mr. John Holcombe, and Mr. John Wilson of Sanders Engineering & Analytical Services, Inc., and was coordinated with Mr. John McPherson of Gulf Power Company. The Florida Department of Environmental Protection was notified so that a representative could be present to observe the testing.

The test was conducted in accordance with the rules and regulations of the Florida Department of Environmental Protection. Further discussion of the test methods are included later in the report.

2. SUMMARY AND DISCUSSION OF RESULTS

The results of the particulate emissions testing for the steady state runs, along with the results of the computations, are summarized in Table I. The equations used in the calculation of the results, along with the completed field data sheets, are presented in Appendix A. The sample calculations of the first run are presented in Appendix B. The quality control checks of the equipment used in the sampling program are included in Appendix C.

There were no problems encountered during the performance of the test. The bottom port of each duct was not sampled due to ash build-up in the duct. One of the other ports was alternately sampled twice on each run to compensate for the port not sampled. At the completion of each run, the filter and probe were removed to a relatively clean, draft-free area for clean-up.

The results of the testing indicate the particulate emission rate during steady state for Plant Smith, Unit 2, is 0.028 LBS/MMBTU. The applicable Florida Department of Environmental Protection rules and regulations require an emission rate of no greater than 0.10 LBS/MMBTU. The results of the testing indicate that the unit is in compliance with the particulate emission condition of the permit to operate issued by the Florida Department of Environmental Protection.

TABLE I. PARTICULATE EMISSIONS TEST RESULTS

GULF POWER COMPANY
PLANT SMITH, UNIT 2, STEADY STATE
5/10/96

Title of Run		RUN 1	RUN 2	RUN 3
Sampling Time -Start	Military	0749	1031	1314
Sampling Time -Stop	Military	1010	1240	1522
F Factor	SDCF/MMBTU	9820	9820	9820
Plant Load	Megawatts	200.0	200.0	200.0
Static Pressure	In. H2O	2.25	2.25	2.25
Barometric Pressure	In. Hg	30.22	30.22	30.22
Average dH	In. H20	0.96	1.34	1.52
Meter correction		1.038	1.038	1.038
Avg. Meter Temp.	Deg. F	80.3	86.1	87.9
% O2	%	7.7	7.6	7.9
%CO2	%	12.0	12.0	12.0
Volume Metered	ACF	63.670	74.660	78.275
Volume Water	Ml	126.0	147.0	131.0
Sampling Time	Minutes	120	120	120
Nozzle Diameter	Inches	0.219	0.234	0.243
Avg. Stack Temp.	Deg. F	344.8	346.2	346.5
Area of Stack	Sq. Feet	253.3400	253.3400	253.3400
Wt. of Part.	Mg.	69.9	48.7	61.5
Number of Points		60	60	60
Avg. Sqrt dP	In. H20	0.8117	0.8298	0.8301

RESULTS OF COMPUTATIONS

		RUN 1	RUN 2	RUN 3	Average
Volume of Gas Sampled	SDCF	65.355	75.898	79.345	
H2O vapor in Gas Stream	PERCENT	8.3	8.4	7.2	8.0
Avg. Stack Gas Velocity	FT/SEC	55.5	56.8	56.7	56.3
Volumetric Flow Rate	SDCFM	515,376	526,267	531,517	524,386
Volumetric Flow Rate	ACF/M	843,755	863,380	861,598	856,244
Particulate Conc.	Grs/SDCF	0.016	0.010	0.012	0.013
Particulate Conc.	Grs/ACF	0.010	0.006	0.007	0.008
Particulate Mass Rate	Lb/Hr	72.8	44.6	54.4	57.2
Particulate Mass Rate	Lb/MMBtu	0.037	0.022	0.027	0.028
Heat Input	MMBTU/Hr	1988.80	2046.21	2020.01	2018.34
Percent of Isokinetic	%	102.4	102.0	97.9	

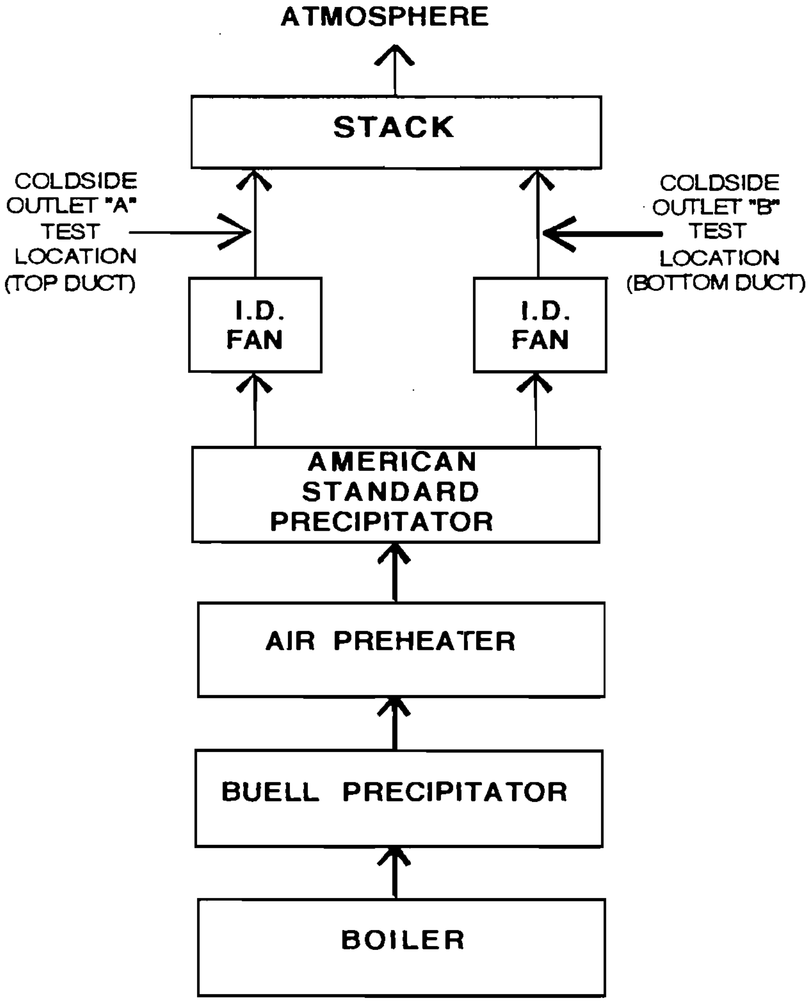
3. PROCESS DESCRIPTION

The process consists of a steam electric generating unit firing bituminous coal for the production of electric energy. The coal is received by either rail, truck, or barge, and loaded directly onto the conveyor feeding the plant, or onto the stockpile and later loaded onto the conveyor belt transporting the coal to the plant. The coal from the conveyor is loaded into bunkers capable of holding between 24 to 36 hours supply of coal. The coal is then fed to pulverizing mills before being fired in the unit through the burners. Upon combustion of the coal in the fire box, approximately 20 percent of the ash falls to the bottom of the boiler and is removed by the ash removal system. The remaining 80 percent exits with the flue gases through the heat exchange and economizer sections of the furnace, and is collected by electrostatic precipitators.

3.1. Source Air Flow

The air flow schematic which depicts the passage of the flue gases exhausted from Plant Smith, Unit 2, is presented in Figure 1.

Figure 1. Air Flow Schematic



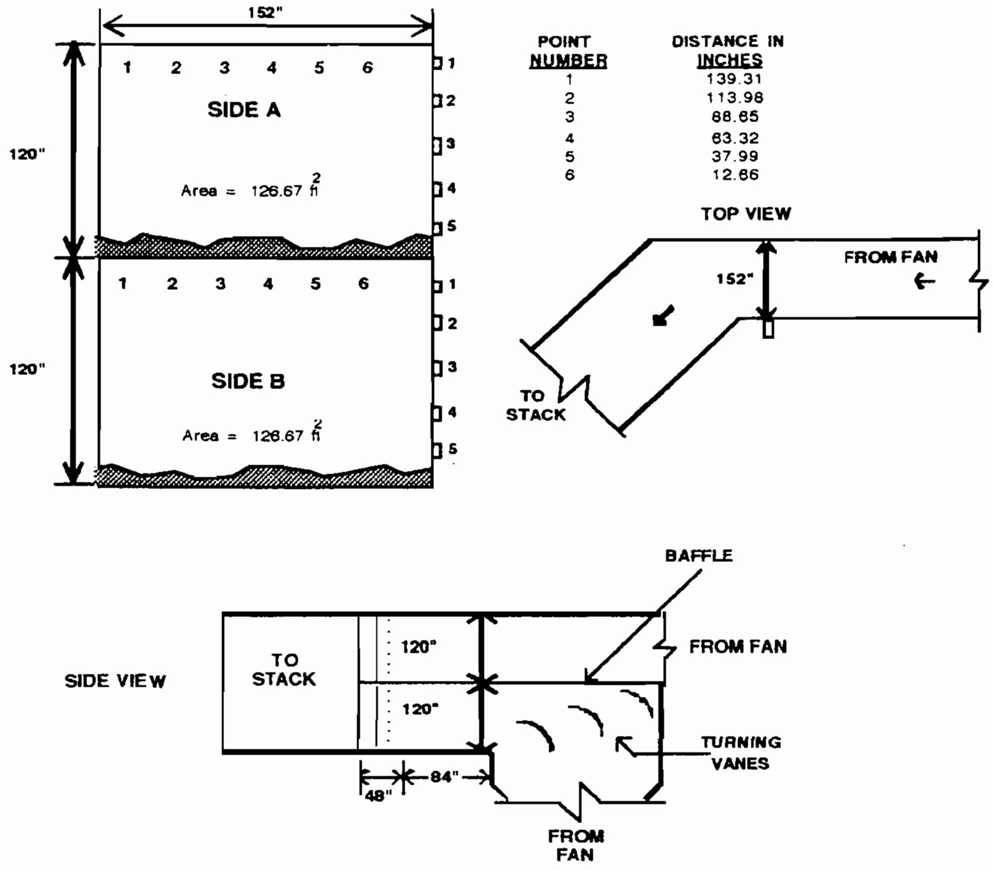
3.2. Operation During Testing

The approximate heat input average during steady state operation, as based on F-factor calculations, is 2018.34 million BTU per hour, resulting in the production of approximately 200 megawatts of electricity. Precipitator data supplied by Gulf Power personnel is given in Appendix D.

4. SAMPLE POINT LOCATION

The sample point locations and outlet duct schematic are presented in Figure 2. Method 1 was used for determination of the number and location of sampling points. The minimum number of points (25) required for rectangular stacks was met by sampling a total of 60 points.

Figure 2. Sample Point Locations



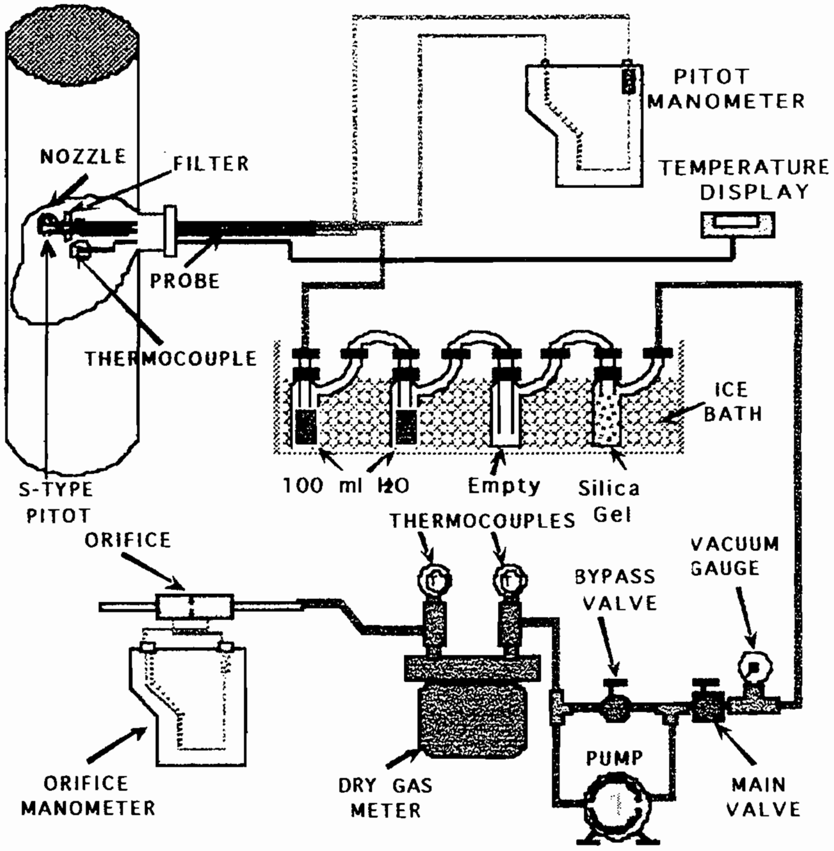
POINT NUMBER	DISTANCE IN INCHES
1	139.31
2	113.98
3	88.65
4	63.32
5	37.99
6	12.66

5. PARTICULATE SAMPLING PROCEDURE (EPA Method 17)

The sampling procedure utilized is that specified in **40 CFR, Part 60, Appendix A, Method 17**. A brief description of this procedure is as follows:

The first impingers were partially filled with 100 milliliters of deionized water. The next impinger was left empty to act as a moisture trap. Preweighed 6 to 16 mesh indication silica gel was added to the last impinger. The sampling equipment manufactured by Lear Siegler (Model 100) or Sanders Engineering (Model 200) was assembled as shown in the attached drawing. The system was leak checked by plugging the inlet to the nozzle and pulling a 15 inch mercury vacuum. A leakage rate not in excess of 0.02 cubic feet per minute was considered acceptable.

Figure 3. Particulate Sampling Train



The inside dimensions of the stack liner were measured and recorded. The required number of sampling points were marked on the probe for easy visibility. The range of velocity pressure, the percent moisture, and the temperature of the effluent

gases were determined. From this data, the correct nozzle size and the nomograph multiplication factor were determined.

Crushed ice was placed around the impingers. The nozzle was placed on the first traverse point with the tip pointing directly into the gas stream. The pump was started immediately and the flow was adjusted to isokinetic sampling conditions. After the required time interval had elapsed, the probe was repositioned to the next traverse point and isokinetic sampling was re-established. This was performed for each point until the run was completed. Readings were taken at each point and recorded on the field data sheet. At the conclusion of each run, the pump was turned off and the final readings were recorded.

5.1. Particulate Sample Recovery

Care was exercised in moving the collection train to the sample recovery area to minimize the loss of collected sample, or the gain of extraneous particulate matter. The volume of water in the impingers was measured, the silica gel impinger was weighed and recorded on the field data sheet. The nozzle, and all sample-exposed surfaces were washed with reagent grade acetone into a clean sample container. A brush was used to loosen any adhering particulate matter and subsequent washings were placed into the container. The filter was carefully removed from the fritted support and placed in a clean separate sample container. A sample of the acetone used in the washing was saved for a blank laboratory analysis.

5.2. Particulate Analytical Procedures

The filter and any loose particulate matter were transferred from the sample container to a clean, tared weighing dish. The filter was placed in a desiccator for at least 24 hours and then weighed to the nearest 0.1 milligram until a constant weight was obtained. The original weight of the filter was deducted, and the weight gain was recorded to the nearest 0.1 milligram.

The wash solution was transferred to a clean, tared beaker. The solution was evaporated to dryness, desiccated to a constant weight, and the weight gain was recorded to the nearest 0.1 milligram.

APPENDIX A EQUATIONS AND FIELD DATA SHEETS

EQUATIONS

1. $$P_s = P_{bar} + \frac{P_g}{13.6}$$

2. $$P_m = P_{bar} + \frac{\overline{\Delta H}}{13.6}$$

3. $$V_s = K_p C_p \overline{\sqrt{\Delta P}} \sqrt{\frac{\overline{T_s}}{M_s P_s}}$$

4. $$V_{m(Std)} = K_1 V_m Y \left[\frac{p_{bar} + \frac{\overline{\Delta H}}{13.6}}{\overline{T_m}} \right]$$

5. $$V_{w(Std)} = 0.04707\ V_{lc}$$

6. $$B_{ws} = \frac{V_{w(Std)}}{V_{m(Std)} + V_{w(Std)}}$$

7. $$M_d = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%N_2 + \%CO)$$

8. $$M_s = M_d(1 - B_{ws}) + 18\ (B_{ws})$$

9. $$EA = \left[\frac{(\%O_2 - 0.5\ (\%CO))}{0.264\ (\%N_2) - ((\%O_2) - 0.5\ (\%CO))} \right] 100$$

10. $Q_a = (V_s)(A_s)(60)$

11. $Q_s = Q_a \ (1\text{-}B_{ws}) \dfrac{(528)}{\overline{T_s}} \dfrac{(P_s)}{29.92}$

12. $E_H = \left(\dfrac{PMR}{H_I} \right)$

13. $E = C_d \ F_{O_2} \left(\dfrac{20.9}{20.9 - \%O_2} \right)$

14. $C_s = 0.0154 \dfrac{M_n}{V_{m(Std)}}$

15. $C_{50} = \dfrac{21 \ C_s}{21 - [(1.5)(\%O_2) - 0.133 \ (N_2) - 0.75 \ (\%CO)]}$

16. $C_{12} = \dfrac{C_s \ (12)}{\%CO_2}$

17. $PMR = (C_s)(Q_s) \dfrac{(60)}{7000}$

18. $V_n = \left[(0.002669)(V_{1c}) + \dfrac{V_m Y}{\overline{T}_m} \left(p_{bar} + \dfrac{\overline{\Delta H}}{13.6} \right) \right] \dfrac{\overline{T}_s}{p_s}$

19. $I = \dfrac{100 \ V_n}{(60) \ Ø \ V_s \ A_n}$

NOMENCLATURE

A_n = Cross-sectional area of nozzel, ft ^{2}

A_s = Cross sectional area of stack, ft ^{2}

B_{ws} = Wator vapor in the gas stream,
proportion by volume (dimensionless)

C_p = Pitot tube coefficient (dimensionless) (0.84)

C_s = Particulate concentration, grains/SDCF

C_d = Particulate concentration, lbs/SDCF

C_{12} = Particulate concentration (C_s adjusted to 12% CO)
grains/SDCF

C_{50} = Particulate concentration (C_s adjusted to 50% excess air)
grains/SDCF

EA = Excess air, %

E = Emission in lb/mmBTU

E_H = Emission in lb/mmBTU, based on heat input

H_I = Total Heat Input, Million BTU per Hour (MMBTU/hr)

I = Percent of isokinetic sampling

K_1 = 17.64 °R/ inches Hg

K_p = Pitot tube constant,

$$85.49 \text{ ft/sec} \left[\frac{(\text{lb/lb-mole})\ (\text{in. Hg})}{(°\text{R})\ (\text{inc. } H_2O)}\right]^{\frac{1}{2}}$$

M_n = Total amount of particulate collected, mg

M_d = Molecular weight of stack gas; dry basis, lb/lb mole

M_s = Molecular weight of stack gas; wet basis, lb/lb mole

P_{bar} = Barometric pressure at the sampling site, in. Hg

NOMENCLATURE (continued)

P_m = Meter pressure, in. Hg

P_s = Absolute stack pressure, in. Hg

P_g = Stack static pressure, in. H_2O

PMR = Particulate mass rate, lb/Hr

Q_a = Volumetric flow rate ACFM

Q_s = Volumetric flow rate SDCFM

V_s = Average stack gas velocity, ft/sec

V_{lc} = Total volume of liquid collected in impingers & silica gel, ml

V_m = Volume of gas sample as measured by dry gas meter, ACF

$V_{m(std)}$ = Volume of gas sample measured by dry gas meter, corrected to standard conditions, SDCF

$V_{w(std)}$ = Volume of water vapor in gas sample, corrected to standard conditions, SCF

V_n = Volume collected at stack conditions through nozzle, ACF

Y = Dry gas meter calibration factor (dimensionless)

ΔH = Average pressure difference of orifice, in. H_2O

ΔP = Velocity head of stack gas, in. H_2O

$\overline{\sqrt{\Delta P}}$ = Average of square roots of the velocity pressure, in. H_2O

Ø = Total sampling time, minutes

$\%CO_2$, $\%O_2$, N_2, $\%CO$ - Number % by volume, dry basis, from gas analysis

F_{O_2} = Oxygen based F factor (9820 SDCF/mmBTU for bituminous coal)

T_s = Temperature of the stack, °R (° F + 460)

SANDERS ENGINEERING & ANALYTICAL SERVICES, Inc.
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Mobile, AL 36695
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FAX#: (205) 633-2285

FIELD DATA SHEET

COMPANY Gulf Power Co
DATE 5-10-96
METER BOX 5-100
PLANT/(UNIT) Smith
OPERATOR JC
ΔHa .75 cu. ft. /min.
LOCATION Unit 2 Steady State
METHOD 17
PROBE 12' liner/length

RUN 1 S.S.

NOZZLE CALIBRATION

PRE	POST
.219	.219
.219	.219
.219	.219
.219	.219
AVERAGE	AVERAGE

NOMOGRAPH

Km
Tm
Noz
Ts
H₂O
PsPm

FILTER 1394

METER READING

126.070	
FINAL	FINAL
62.400	
INITIAL	INITIAL
63.670	
NET	NET

LEAK CHECK

SYSTEM Pre	SYSTEM Post	PITOT Pre	PITOT Post
✓ in. Hg	22 in. Hg	impact ✓	impact ✓
✓ cfm	.008 cfm	static ✓	static ✓

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	215	100	0	1555.0
INITIAL	100	100	0	1544.0
NET	115	0	0	11.0

TOTAL 126.0

GAS ANALYSIS

O_2 7.7
CO_2 12.0
CO

STATIC 2.25 in. H_2O

BAROMETRIC 30.22 in. Hg

RUN 2 S.S.

NOZZLE CALIBRATION

PRE	POST
.234	.234
.234	.234
.234	.234
.234	.234
AVERAGE	AVERAGE

FILTER 1395

METER READING

101.360	
FINAL	FINAL
26.700	
INITIAL	INITIAL
74.66	
NET	NET

LEAK CHECK

SYSTEM Pre	SYSTEM Post	PITOT Pre	PITOT Post
✓ in. Hg	18 in. Hg	impact ✓	impact ✓
cfm	.007 cfm	static ✓	static ✓

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	224	100	0	1626.0
INITIAL	100	100	0	1603.0
NET	124	0	0	23.0

TOTAL 147.0

GAS ANALYSIS

O_2 7.6
CO_2 12.0
CO

STATIC 2.25 in. H_2O

BAROMETRIC 30.22 in. Hg

RUN 3 S.S.

NOZZLE CALIBRATION

PRE	POST
243	.243
243	243
244	.243
243	.243
AVERAGE	AVERAGE

FILTER 1396

METER READING

80.675	
FINAL	FINAL
2.400	
INITIAL	INITIAL
78.275	
NET	NET

LEAK CHECK

SYSTEM Pre	SYSTEM Post	PITOT Pre	PITOT Post
✓ in. Hg	22 in. Hg	impact ✓	impact ✓
✓ cfm	.008 cfm	static ✓	static ✓

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	220	100	0	1600.0
INITIAL	100	100	0	1589.0
NET	120	0	0	11.0

TOTAL 131.0

GAS ANALYSIS

O_2 7.9
CO_2 12.0
CO

STATIC 2.25 in. H_2O

BAROMETRIC 30.22 in. Hg

Coal Mill Out → 8:22-33

Port # / Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)						Vac. in. H_g
					Stack	Probe	Hot Box	Imp.	Gas Meter In	Gas Meter Out	
2-1	7:49	62.400	.47	.64	335			67	74	74	2
2	:51	63.700	.48	65	336			✓	74	74	2
3	:53	64.300	.67	.91	336			✓	75	74	2
4	:55	65.200	.92	1.25	337			✓	76	74	4
5	:57	66.200	.93	1.29	336			✓	77	73	4
6	:59	67.500	1.03	1.43	336			✓	77	74	4
3-1	8:02	68.735	.53	.74	337			66	77	74	3
2	:04	69.700	.66	.91	337			✓	77	74	3
3	:06	70.900	.68	.94	337			✓	77	74	3
4	:08	71.600	.72	.99	338			✓	79	74	3
5	:10	72.950	.72	.99	337			✓	80	74	3
6	:12	73.600	.62	.86	334			✓	80	74	4
4-1	8:18	74.700	.46	.64	338			61	80	74	3
2	:20	75.740	.49	.68	339			✓	80	75	4
3	:33	76.300	.66	.92	339			✓	78	77	4
4	~~4~~:35 ~~34~~	77.500	.88	1.22	338			56 ✓	78	77	4
5	:37 ~~36~~	78.600	77	1.10	337			✓	80	77	5
6	:39 ~~38~~	79.500	.96	1.37	337			✓	80	77	5
~~4~~-1	8:41 ~~30~~	80.800	54	.77	337			56	80	77	3
2	:43 ~~32~~	81.800	.50	.72	337			✓	80	77	3
3	:45 ~~34~~	82.650	.77	1.10	337			✓	81	78	5
4	:47 ~~36~~	83.750	.83	1.19	337			✓	82	78	5
5	:49 ~~38~~	84.850	.68	.98	337			✓	82	78	5
6	:51 ~~40~~	85.800	.87	1.25	337			✓	82	78	5
5-1	8:53	87.200	.52	.74	338			54	82	78	5
2	:55	87.950	.53	.76	338			✓	83	78	5
3	:57	89.500	.28	.40	339			✓	83	78	5
4	:59	88.600	.37	.53	339			✓	83	78	3
5	9:01	90.500	.26	.37	339			✓	83	78	3
6	:03	91.200	.92	1.32	346			✓	83	78	6
7-1	:07	~~94.~~ 92.400	.72	1.03	352			57	83	79	5
2	:09	93.300	.90	1.29	352			✓	83	79	5

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co Date 5-10-96

Site Smith Unit 2 Stack Stack Run # 1 S.S. Page ___ Of ___

Port #		Gas Meter	Vel. Head	Orifice Head	Temperature (F)						Vac.
		Vol.	ΔP	ΔH			Hot		Gas Meter		in. H_g
Point #	Time	(cu. ft.)	in. H_2O	in. H_2O	Stack	Probe	Box	Imp.	In	Out	
7-3	9:11	94.850	.77	1.11	351			56	84	79	6
4	:13	96.100	.83	1.19	351			✓	84	79	6
5	:15	97.100	.96	1.37	351			✓	84	79	6
6	:17	98.500	.98	1.41	351			✓	85	80	6
8-1	9:20	99.500	.58	.82	352			56	85	80	5
2	:22	100.600	.68	.96	352			✓	85	80	6
3	:24	102.100	.41	.58	352			✓	85	80	4
4	:26	102.800	.70	.99	352			✓	85	80	5
5	:28	104.000	.43	.61	352			✓	85	80	5
6	:30	104.900	.53	.75	352			✓	85	80	5
9-1	9:33	105.900	.57	.80	353			57	85	80	5
2	:35	107.00	.57	.80	353			✓	85	80	5
3	:37	107.950	.68	.96	353			✓	85	80	5
4	:39	108.700	.87	1.23	353			✓	85	80	6
5	:41	110.000	.93	1.31	353			✓	85	80	6
6	:43	111.200	.62	.89	351			✓	85	80	5
5-1	:45	112.200	.62	.89	353			56	86	81	5
2	:47	113.300	.67	.96	353			✓	86	81	5
3	:49	114.400	.96	1 38	352			✓	86	81	7
4	:51	115.500	.92	1.32	353			✓	87	81	6
5	:53	116.800	.92	1.32	352			✓	87	81	5
6	:55	118.100	.77	1.10	351			✓	87	81	6
10-1	9:58	119.200	.27	.39	352			✓	87	81	5
2	10:00	120.400	.16	.23	351			✓	87	81	5
3	:02	121.400	.28	.40	353			✓	87	81	5
4	:04	122.200	.68	.97	353			✓	87	81	5
5	:06	123.700	.83	1.19	353			✓	87	82	5
6	:08	124.800	1.25	1.80	353			✓	87	82	8
	:10	126.070									

.81155757

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co

Date 5-10-96

Site Smith 4-2 Steady State

Run # 1

Page ______ Of ______

O2 6.8

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)				Gas Meter		Vac. in. H_g
					Stack	Probe	Hot Box	Imp.	In	Out	
10-1	10:31	26.700	.42	78	354			66	83	83	4
2	:33	27.600	.43	.80	353			✓	84	83	4
3	:35	28.800	.22	.41	353			✓	84	83	3
4	:37	29.500	.58	1.09	353			✓	84	83	5
5	:39	30.600	~~.92~~ 1.06	~~1.73~~ 1.98	353			✓	84	83	7
6	:41	31.900	1.22	2.29	353			✓	86	82	9
9-1	10:44	33.500	.56	1.05	354			✓	86	82	6
2	:46	34.700	.52	.97	354			65	86	82	5
3	:48	36.600	.90	1.70	354			✓	86	82	9
4	:50	37.100	.93	1.75	354			64	87	82	8
5	:52	38.500	.74	1.39	353			✓	87	82	8
6	:54	37.800	1.42	2.67	351			✓	87	82	11
8-1	10:57	41.520	.77	1.44	353			61	88	83	7
2	:59	42.800	.70	1.32	354			✓	88	83	7
3	11:01	44.200	.57	1.07	354			✓	88	83	6
4	:03	45.300	.57	1.07	355			✓	88	84	6
5	:05	46.350	.54	1.01	354			✓	88	84	6
6	:07	47.700	.52	.97	350			✓	88	84	6
8-1	11:09	48.500	.68	1.28	350			63	88	84	7
2	:11	49.900	.73	1.37	354			✓	88	83	5
3	:13	51.100	.52	.98	355			✓	89	84	6
4	:15	52.300	.63	1.18	355			✓	89	84	6
5	:17	53.350	.58	1.09	354			✓	89	84	6
6	:19	54.400	.49	.92	354			✓	89	84	6
7-1	11:22	55.600	~~1.73~~ .92	1.73	351			56	89	84	5
2	:24	57.200	.94	1.76	353			✓	89	84	9
3	:26	58.300	.83	1.56	354			✓	89	84	9
4	:28	59.900	.92	1.73	354			✓	89	84	9
5	:30	61.400	.97	1.83	354			✓	90	84	9
6	:32	62.500	.92	1.73	354			✓	90	84	10
5-1	11:37	64.000	.52	1.00	340			58	87	84	7
2	:39	65.100	.44	.84	340			✓	87	84	7

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co Date 5-10-96

Site Smith Unit 2 Stack Stack Run # 2 Page SS Of

84 o2

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F) Stack	Probe	Hot Box	Imp.	Gas Meter In	Gas Meter Out	Vac. in. H_g
5-3	11 :41	66.300	.63	1.21	340			57	88	84	7
4	:43	67.500	.68	1.31	340			✓	88	84	7
5	:45	68.900	.72	1.39	340			✓	89	84	8
6	:47	70.150	.94	1.81	340			✓	89	84	7
4-1	11:50	71.600	.47	.90	340			56	89	84	6
2	:52	72.500	.52	1.00	340			56	89	84	6
3	:54	74.100	.77	1.48	340			✓	89	87	8
4	:56	74.950	.77	1.48	340			✓	85	84	8
5	:58	76.750	.62	1.19	339			✓	89	84	8
6	12:00	77.500	.76	1.46	339			✓	90	84	8
3-1	12:03	78.800	.58	1.11	339			56	90	84	7
2	:05	79.900	.63	1.21	339			✓	90	84	7
3	:07	81.100	.67	1.29	339			✓	90	84	7
4	:09	82.300	.83	1.60	339			✓	90	84	9
5	:11	83.600	.74	1.42	339			✓	90	84	9
6	:13	85.100	.57	1.10	335			✓	90	84	7
3-1	12 :15	86300	.57	1.10	339			58	90	84	7
2	:17	87.300	.64	1.23	339			✓	90	84	7
3	:19	88.500	.74	1.42	339			✓	90	85	8
4	:21	89.800	.82	1.57	339			✓	90	85	7
5	:23	9100	.73	1.40	339			✓	90	85	7
6	:25	92.500	.58	1.11	336			✓	90	85	7
2-1	12:28	93.600	.44	.84	338			60	90	85	6
2	:30	94.900	.57	1.09	339			✓	90	85	6
3	:32	95.800	.66	1.27	339			✓	90	85	7
4	:34	97.600	.88	1.69	339			✓	90	85	8
5	:36	98.700	.98	1.88	339			✓	90	85	8
6	:38	99.950	.94	1.81	338			✓	90	85	8
	:40	1~~[illegible]~~									
	~~[illegible]~~	101.360									

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co Date 5-10-96

Site Smith Unit 2 ~~Base~~ steady state Run # 2 5.5 Page ____ Of ____

Port # / Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F) Stack	Probe	Hot Box	Imp.	Gas Meter In	Gas Meter Out	Vac. in. H_g
2 - 1	13:14	2.400	.45	1.00	338			68	85	85	4
2	:16	3.300	.48	1.07	338			✓	85	85	4
3	:18	4.500	.51	1.14	338			✓	85	85	5
4	:20	5.700	.92	1.99	339			✓	86	84	7
5	:22	7.300	.92	1.99	339			✓	87	84	7
6	:24	8.850	.90	1.94	338			✓	88	85	7
2 - 1	13:26	10.400	.50	1.08	338			66	89	84	5
2	:28	11.600	.54	1.16	338			✓	89	84	5
3	:30	13.000	.54	1.16	338			✓	89	85	5
4	:32	13.900	.92	1.99	338			✓	90	85	5
5	:34	15.100	.98	2.12	339			✓	90	85	5
6	:36	16.250	.94	2.03	339			✓	90	85	7
3 - 1	13:39	18.330	.53	1.14	339			64	90	85	5
2	:41	19.500	.64	1.38	339			✓	90	85	6
3	:43	20.600	.62	1.34	340			✓	90	85	6
4	:45	22.200	.66	1.42	340			✓	90	85	5
5	:47	23.300	.68	1.47	338			✓	90	85	6
6	:49	24.500	.63	1.36	338			✓	90	85	6
4 - 1	13:52	25.800	.48	1.03	339			63	90	85	5
2	:54	27.500	.43	.93	340			✓	90	85	5
3	:56	28.350	.70	1.51	340			✓	90	85	6
4	:58	29.500	.82	1.77	340			✓	90	85	7
5	14:00	31.000	.68	1.47	339			✓	90	85	7
6	:02	32.100	.76	1.64	339			✓	90	85	7
5 - 1	14:05	33.600	.58	1.25	340			.62	90	85	6
2	:07	35,100	.46	~~.975~~ 1.00	340			✓	90	85	6
3	:08	36.500	.36	.78	340			✓	90	85	5
4	:11	37.200	.36	.78	342			✓	90	85	4
5	:13	38.000	.72	1.55	339			✓	92	85	6
6	:15	39.200	.86	1.86	339			✓	92	85	6
7 - 1	14:18	41.100	.66	1.42	353			63	90	85	6
2	20	42.700	.82	1.77	355			✓	90	85	8

O2 8.)

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co

Date 5-10-96

Site Smith Unit 2 Steady State

Run # S.S. 3

Page ______ Of ______

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)				Gas Meter		Vac. in. H_g
					Stack	Probe	Hot Box	Imp.	In	Out	
7-3	:22	43.200	.92	1.99	354			63	90	85	9
4	:24	44.300	.92	1.99	354			✓	90	85	9
5	.26	46.000	.94	2.03	354			✓	90	85	9
6	:28	47.200	.89	1.92	353			✓	90	85	8
7-1	14 :30	48.600	.75	1.62	353			56	90	85	8
2	:32	50.100	.86	1.86	353			✓	90	85	8
3	:34	52.100	.88	1 90	354			✓	90	85	8
4	:36	53.500	.96	2.08	354			✓	90	85	8
5	:38	54.900	.94	2.03	353			✓	90	85	9
6	:40	56.000	.88	1.90	352			✓	91	85	9
8-1	14 :43	57.600	.73	1.57	353			68	91	85	7
2	:45	59.300	.68	1.47	353			✓	91	85	7
3	.47	60.200	.62	1.34	354			✓	91	85	7
4	49	61.500	.77	1.66	354			✓	91	85	7
5	:51	62.900	.73	1.58	354			✓	91	89	8
6	:53	64.300	.57	1.23	354			✓	91	89	8
9-1	14. :57	65.700	.57	1.23	353			58	91	89	6
2	:59	67.100	.52	1.12	361			✓	91	89	6
3	15:01	68.200	.83	1.79	354			✓	91	89	6
4	:03	69.200	.86	1.86	354			✓	91	89	8
5	:05	70.900	.83	1.79	353			✓	91	89	9
6	:07	72.100	.64	1.38	352			✓	91	89	8
10-1	15:10	73.500	.32	.69	356			✓	91	89	7
2	:12	74.500	.36	.77	356			62	91	89	5
3	:14	75.600	.48	1.04	355			✓	91	89	6
4	:16	76.900	.73	1.57	355			✓	91	89	6
5	:18	77.900	.92	1.99	354			✓	91	89	10
6	:20	79.100	.92	1.99	354			62	90	88	10
	15:22	80.675									

22 0

-2.2

.8294576

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co   Date 5-10-96

Site Smith Unit 2 steady State   Run # 3   3 S.S. Page ____ Of ____

LABORATORY ANALYSIS & CHAIN OF CUSTODY

COMPANY/PLANT: Gulf Power - Plant Smith

UNIT #: 2 DATE OF TEST: 5-10-96 TYPE OF TEST: ☐ M-5 ☒ M-17 ☐ OTHER ______

SAMPLE #	RELINQUISHED BY	RECEIVED BY	TIME	DATE	REASON FOR CHANGE
3 Filters				5-7-96	To Lab
3 Wash					No change

UNIT # 2 - Steady State

RUN # 1	FILTER # 1394	BEAKER # 30 WASH (ML) 45
FINAL WEIGHT	189.1	67081.4
INITIAL WEIGHT	122.6	67078.0
DIFFERENCE	66.5	3.4
CORRECTED TOTAL WEIGHT		69.9
RUN # 2	FILTER # 1395	BEAKER # 35 WASH (ML) 45
FINAL WEIGHT	166.6	68565.4
INITIAL WEIGHT	120.9	68562.4
DIFFERENCE	45.7	3.0
CORRECTED TOTAL WEIGHT		48.7
RUN # 3	FILTER # 1396	BEAKER # 38 WASH (ML) 55
FINAL WEIGHT	177.8	71358.2
INITIAL WEIGHT	123.4	71351.1
DIFFERENCE	54.4	7.1
CORRECTED TOTAL WEIGHT		61.5
RUN # ____	FILTER # ____	BEAKER # ____ WASH (ML) ____
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		

UNIT # ______

RUN # ____	FILTER # ____	BEAKER # ____ WASH (ML) ____
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
RUN # ____	FILTER # ____	BEAKER # ____ WASH (ML) ____
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
RUN # ____	FILTER # ____	BEAKER # ____ WASH (ML) ____
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
WASH SOLVENT BLANK (ML) ____		BEAKER # ____ WASH (ML) ____
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTION FACTOR (MG/ML)		

ALL WEIGHTS ARE IN MILLIGRAMS (MG)

APPENDIX B SAMPLE CALCULATIONS

Input and Constants

```
                3
     9820 ft
f := --------
      mm btu

pg := 2.25 in. H2O

pbar := 30.22 in. Hg.

Δhavg := 0.96 in. H2O

y := 1.038

tm := 80.3 °F

o2 := 7.7

co2 := 12.

                  3
vm := 63.67 ft

vlc := 126. ml

theta := 120 min

nozdia := 0.219 in.

ts := 344.8 °F

                   2
as := 253.34 ft

mn := 69.9 mg

numberofpoints := 60

                          0.5
sqrtΔp := 0.8117 in. H2O

                          lb in. Hg.     0.5
      85.49 1 ft 1 (------------------)
                      lb—mole °R in. H2O
kp := ------------------------------------
                       1 sec

cp := 0.84

      17.64 °R
kl := --------
      in. Hg.
```

$$ts = \frac{(ts + 460\ °F)\ °R}{°F}$$

804.8 °R

$$tm = \frac{(tm + 460\ °F)\ °R}{°F}$$

540.3 °R

$$n2 = 100 - o2 - co2$$

80.3

$$an = \frac{nozdia^2\ \ 3.1416}{4\ \left(\frac{12\ in.}{ft}\right)^2}$$

$0.000261587\ ft^2$

Calculations

Equation 1

$$ps = pbar + \frac{pg}{\frac{13.6 \text{ in. } H2O}{1 \text{ in. } Hg.}}$$

30.3854 in. Hg.

Equation 2

$$pm = pbar + \frac{\Delta havg}{\frac{13.6 \text{ in. } H2O}{\text{in. } Hg.}}$$

30.2906 in. Hg.

Equation 3

$$vmstd = \frac{k1 \; vm \; y \left(pbar + \frac{\Delta havg}{\frac{13.6 \text{ in. } H2O}{\text{in. } Hg.}}\right)}{tm}$$

65.3587 ft^3

Equation 4

$$vwstd = \frac{0.04707 \text{ ft}^3 \; vlc}{ml}$$

5.93082 ft^3

Equation 5

$$bws = \frac{vwstd}{vmstd + vwstd}$$

0.0831934

Equation 6

$$md = \frac{(0.44\ co2 + 0.32\ o2 + 0.28\ n2)\ lb}{lb\text{-}mole}$$

$$\frac{30.228\ lb}{lb\text{-}mole}$$

Equation 7

$$ms = md\ (1 - bws) + \frac{bws\ 18\ lb}{lb\text{-}mole}$$

$$\frac{29.2107\ lb}{lb\text{-}mole}$$

Equation 8

$$vs = kp\ cp\ sqrt\Delta p\ \left(\frac{ts}{ms\ ps}\right)^{0.5}$$

$$\frac{55.5048\ ft}{sec}$$

Equation 9

$$qa = \frac{vs\ as\ 60\ sec}{min}$$

$$\frac{843695.\ ft^{3}}{min}$$

Equation 10

$$qs = \frac{qa\ (1 - bws)\ 528\ {}^{\circ}R\ ps}{ts\ 29.92\ in.\ Hg.}$$

$$\frac{515363.\ ft^{3}}{min}$$

Equation 11

$$cs = \frac{0.0154\ gr\ mn}{mg\ vmstd}$$

$$\frac{0.01647\ gr}{ft^3}$$

Equation 12

$$pmr = \frac{cs\ qs\ 60\ min}{hour\ \frac{7000\ gr}{lb}}$$

$$\frac{72.7546\ lb}{hour}$$

Equation 13

$$e = \frac{cs\ f\ 20.9\ 1\ lb}{(20.9 - o2)\ 7000\ gr}$$

$$\frac{0.0365831\ lb}{mm\ btu}$$

Equation 14

$$vn = \frac{ts\ \left(\frac{0.002669\ in.\ Hg.\ ft^3\ vlc}{ml\ {}^{\circ}R} + \frac{vm\ y\ pm}{tm}\right)}{ps}$$

$$107.043\ ft^3$$

Equation 15

$$i = \frac{100\ \%\ vn}{\frac{60\ sec\ theta\ vs\ an}{min}}$$

$$102.395\ \%$$

Equation 16

$$hi = \frac{pmr}{e}$$

$$\frac{1988.75\ mm\ btu}{hour}$$

APPENDIX C QUALITY CONTROL

INITIAL
METER CALIBRATION FORM - DGM

DATE: 12-10-95 Box No. S-100

Ref. DGM Ser. # 1044453 Calibrated By JACK COVINGTON

RUN #	1	2	3	4	5
DELTA H (DGM)	0.50	1.00	1.50	2.00	3.00
Y (Ref. DGM)	1.014	1.014	1.014	1.014	1.014
Reference DGM					
Gas Vol. Initial	10.000	16.400	22.000	28.500	34.600
Gas Vol. Final	15.800	21.600	28.000	34.000	40.800
Meter Box DGM					
Gas Vol. Initial	90.495	96.775	102.265	108.630	114.610
Gas Vol. Final	96.195	101.880	108.140	114.015	120.650
Reference DGM					
Temp.	Avg.	Avg.	Avg.	Avg.	Avg.
Deg F Initial	68	69	68	69	70
Deg F Final	69	68	69	70	69
Meter Box DGM					
Temp. Initial In	68	72	75	78	79
Temp. Initial Out	66	68	69	71	71
Temp. Final In	72	75	77	79	80
Temp. Final Out	68	69	70	71	72
P Bar IN. Hg	30.08	30.08	30.08	30.08	30.08
Time (sec.)	849	549	524	418	390
Meter Calibration Factor (Y)	1.031	1.035	1.040	1.041	1.045
Qm (C.F.M.)	0.418	0.579	0.700	0.803	0.970
Km (Std Pressure)	0.759	0.743	0.733	0.727	0.717
DELTA Ha	1.62	1.68	1.72	1.74	1.78
Average Y (Meter Calibration Factor				1.038	
Average Km (Standard Pressure)				0.736	
Average DELTA Ha of Orifice				1.706	

Y= ≤ .03
Max & Min ≤ .02 from Avg
Final Avg within 5% of Initial Avg
ΔHa = Max & Min ≤ .2 from Avg

POST TEST QUALITY ASSURANCE

Date: 5/16/96 BOX #: **S-100**

Ref. Meter: 1044453 Calibrated By: **JACK COVINGTON**

DRY GAS METER

	Unit	Run 1	Run 2	Run 3
FIELD METER ΔH	In. H_2O	1.50	1.50	1.50
Initial Gas Volume	$Ft.^3$	56.400	61.700	69.000
Final Gas Volume	$Ft.^3$	61.700	69.000	120.155
Initial Temp. In	°F	76	76	76
Initial Temp. Out	°F	76	77	78
Final Temp. In	°F	73	73	73
Final Temp. Out	°F	72	72	72
REF. METER Y	*Dimensionless*	1.014	1.014	1.014
Initial Gas Volume	$Ft.^3$	18.540	23.788	31.040
Final Gas Volume	$Ft.^3$	23.788	31.040	81.700
Initial Temp.	°F	77	85	91
Final Temp.	°F	73	79	85
Barometric Pressure	In. Hg	30.01	30.01	30.01
Time	sec	465	644	4502
Meter Calibration Factor	*Dimensionless*	0.999	0.990	0.976
$\Delta H_{@}$	In. H_2O	1.801	1.855	1.898
Average Y	*Dimensionless*	0.988		
Initial Y	*Dimensionless*	1.038		
Percent Error	%	-4.8	*(Allowed 5.0%)*	

DIFFERENTIAL PRESSURE GAUGE

Ref. Pressure in H_2O	Magnehelic Pressure in H_2O	Percent Error (+/- 5%)
0.00	0.00	0
0.75	0.76	1.333333333
0.39	0.39	0

TEMPERATURE SENSOR

Ref. Temp. (°F)	Thermocouple Temp. (°F)	Percent Error (Allowed 1.5% of Absolute)
280	279	-0.14

ARENOID BAROMETER

Reference Barometer	Test Barometer	0.1 Diff. Allowed
30.01	30.08	0.07

MAGEHELIC CALIBRATION

BOX	2879	S-100	C-133	C-175	S-102	S-101	S-103
SER. NO.		91126AM91	9126AM91	R90125MR6	R74D	R22D	R20208A617
RANGE	0-2	0-2	0-2	0-2	0-5	0-2	0-2
REFERENCE READING	FIELD DEVICE READING						
0.000		0.00	0.00	0.00	0.00	0.00	0.00
0.050							
0.150							
0.200							
0.250							
0.450							
0.50	0.50	0.51	0.50	0.51	0.51	0.50	0.50
1.00	0.99	1.01	0.98	1.01	1.01	0.98	1.01
1.30							
1.80	1.80	1.82	1.79	1.82	1.81	1.79	1.82
2.50							
4.50							
5.0							
9.0							
13.0							
22.0							

SIGNATURE: Edward L. Harris

DATE: 12-5-95

MAGEHELIC CALIBRATION

BOX #1

SER. NO.	10720-AB68	R1061-6AG48	R5031-SEB76	R1062-9JA82	R1051-3MR42	R90124 RI119	
RANGE	0-0.25	0-0.50	0-2	0-5	0-10	0-25	
REFERENCE READING			FIELD DEVICE READING				
0.000	0.000	0.000	0.000	0.000	0.000	0.000	
0.050	0.050						
0.150	0.150	0.140					
0.200	0.190						
0.250		0.250					
0.450		0.450					
0.50			0.50				
1.00			1.00				
1.30				1.30			
1.80			1.80				
2.50				2.50	2.48		
4.50				4.50			
5.0					5.0	5.0	
9.0					9.02		
13.0						13.0	
22.0						22.0	

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION

BOX #2

SER. NO.	10819-DR2	R1090-2AG18	R50315-EB93	R1062-9TA87	30830-AM79	R1072-2MC5	
RANGE	0-0.25	0-0.50	0-2	0-5	0-10	0-25	
REFERENCE READING	FIELD DEVICE READING						
0.000	0.000	0.000	0.00	0.00	0.0	0.0	
0.050	0.050						
0.150	0.155	0.152					
0.200	0.205						
0.250		0.256					
0.450		0.456					
0.50			0.52				
1.00			1.04				
1.30				1.32			
1.80			1.83				
2.50				2.55	2.49		
4.50				4.50			
5.0					4.9	5.2	
9.0					8.8		
13.0						12.9	
22.0						22.0	

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION

BOX #3

SER. NO.	R10908AG71 MRR1	R0112642	R10608CF20 CF20	
RANGE	0-0.50	0-2.0	0-10	
REFERENCE READING	FIELD DEVICE READING			
0.000	0.00	0.00	0.0	
0.050				
0.150	0.149			
0.200				
0.250	0.240			
0.450	0.450			
0.50		0.50		
1.00		0.98		
1.50				
1.80		1.78		
2.50			2.5	
4.50				
5.0			5.0	
9.0			9.0	
13.0				
22.0				

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION

BOX #4

SER. NO.	R22D	R90051 6GT21	R90101 5CD102
RANGE	0-0.50	0-5	0-25
REFERENCE READING	FIELD DEVICE READING		
0.000	0.000	0.00	0.0
0.050			
0.150	0.151		
0.200			
0.250	0.251		
0.450	0.455		
0.50			
1.00			
1.30		1.27	
1.80			
2.50		2.52	
4.50		4.55	
5.0			5.0
9.0			
13.0			13.0
22.0			21.6

SIGNATURE: Edward L Harris

DATE: 12/22/95

TEMPERATURE CALIBRATIONS - DEGREES FAHRENHEIT

REFERENCE DEVICE READING*	0 DEG. F	210 DEG.	420 DEG.	630 DEG.	840 DEG.	1050 DEG.	1260 DEG.	1470 DEG.	1680 DEG.	1900 DEG.
2879	0	217	421	630	839	1050	1260	1471	1681	1900
METER BOX #1 C-133 11580	0	212	423	635	842	1053	1264	1475	1679	1910
METER BOX #2 C-175 15962	0	211	423	627	839	1052	1265	1475	1687	1903
METER BOX #5 S-100 15751	2	211	417	628	844	1062	1279	1491	1698	1907
METER BOX #6 S-101 15751	0	210	419	628	839	1058	1255	1473	1691	1900
PORTABLE THERMOCOUPLE # 2 (Blue)	2	209	415	628	837	1053	1260	1468	1679	1908
PORTABLE THERMOCOUPLE # 2 (Green)	2	211	417	627	842	1058	1273	1484	1688	1896
PINK T140293	-1	208	415	624	840	1056	1272	1482	1687	1894
PORTABLE THERMOCOUPLE (Yellow)	0	210	419	632	840	1050	1259	1470	1680	1901
PORTABLE THERMOCOUPLE T-105998 (Black)	1	209	416	625	839	1055	1270	1481	1684	1891
METER BOX S-102	-2	209	417	625	837	1049	1259	1462	1658	1890
METER BOX S-103	4	215	423	632	844	1057	1266	1471	1667	1895

DATE: 12-05-95 **SIGNATURE:** Edward L. Harris

* Reference Device is an Omega Engineering CL505-A calibrated reference thermocouple-potentiometer system.

SANDERS ENGINEERING &
ANALYTICAL SERVICES, Inc.

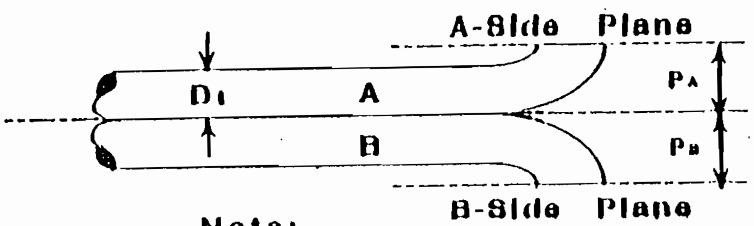
1566 Leroy Stevens Rd.
Mobile, Al. 36695

Office: (205) 633-4120
FAX#: (205) 633-2285

The Pitot used was within the following geometric specifications:

D_t between 0.48 and 0.95 cm (3/16 and 3/8 in.)

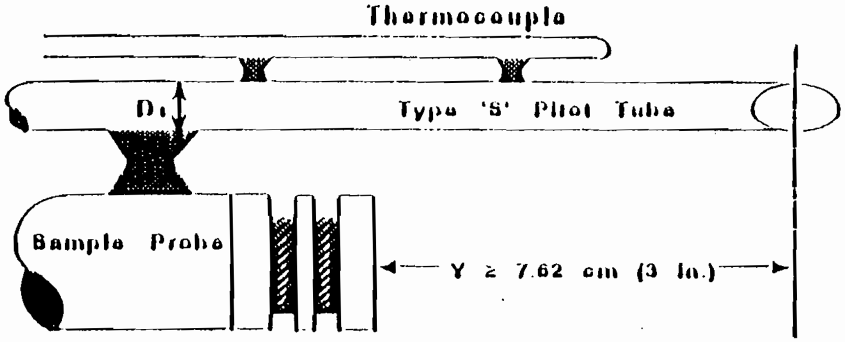
C_p = 0.84



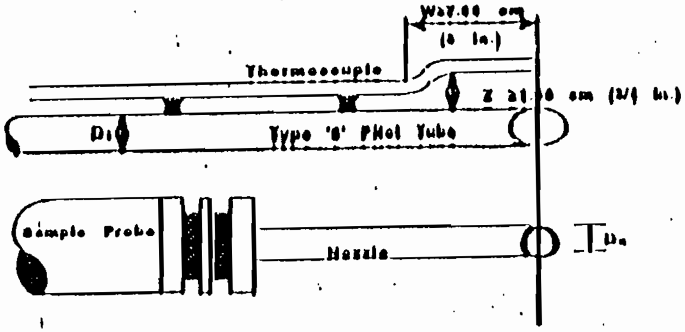
Note:

$1.05\ D_t \le 1.50\ D_t$

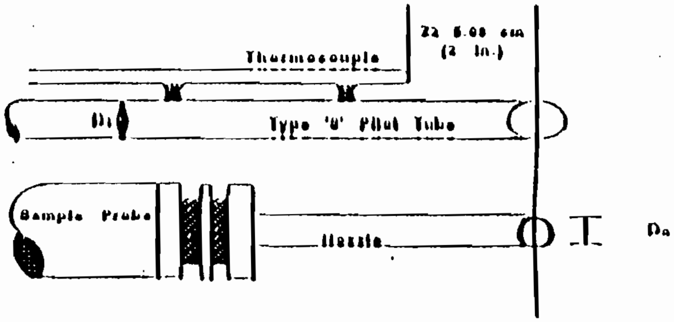
$P_A = P_B$



Minimum pitot-sample probe separation needed to prevent interference



OR



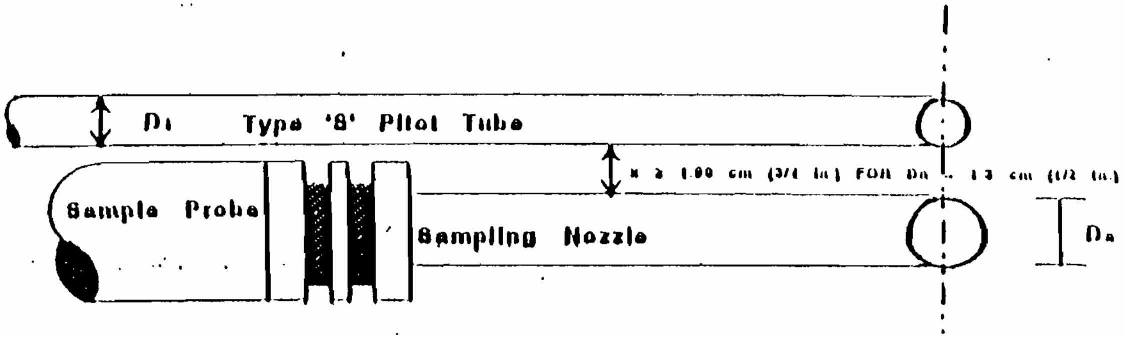
Proper thermocouple placement to prevent interference.

SANDERS ENGINEERING &
ANALYTICAL SERVICES, Inc.

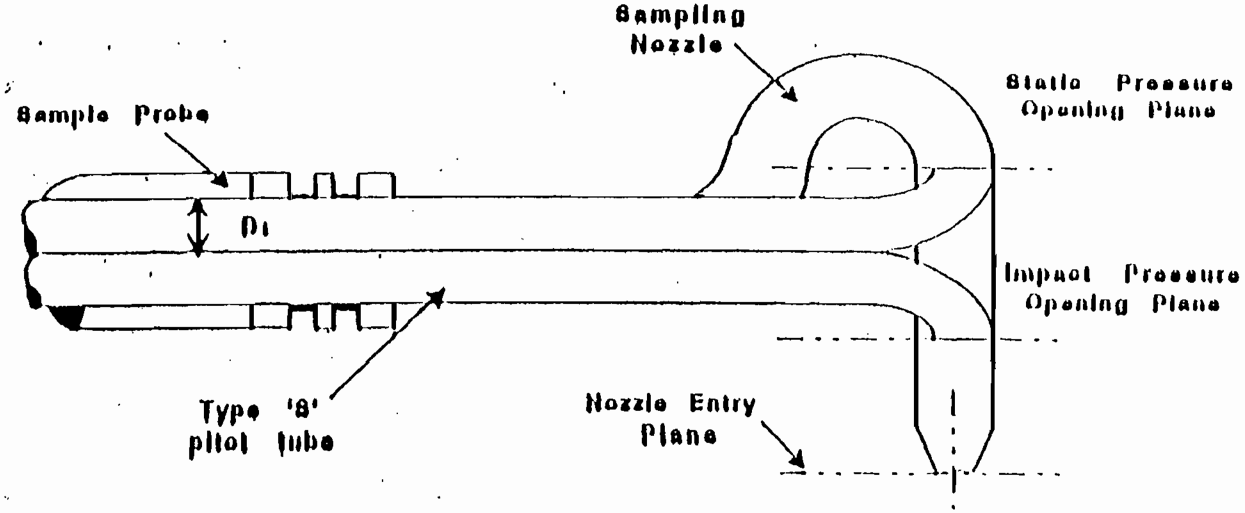
1568 Leroy Stevens Rd.
Mobile, AL 36695

Office: (205) 633-4120
FAX#: (205) 633-2285

Proper pitot tube-sampling nozzel configuration to prevent aero-dynamic interference; buttonhook type nozzle; centers of nozzle and pitot opening aligned; D_t between 0.48 and 0.95 cm (3/16 and 3/8 in.)



Bottom view showing minimum pitot/nozzle separation



Side view; to prevent pitot tube from interfering with the gas flow streamlines approaching the nozzle, the impact pressure opening plane of the pitot tube shall be even with or above the nozzle entry plane.

SANDERS ENGINEERING & ANALYTICAL SERVICES, Inc.

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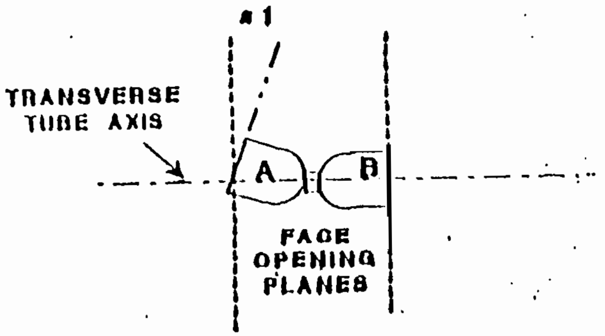
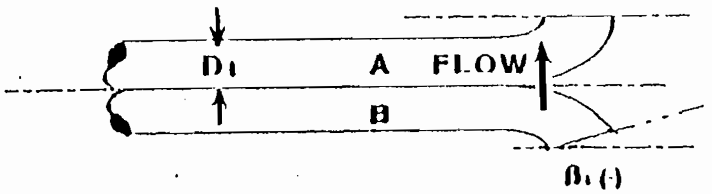
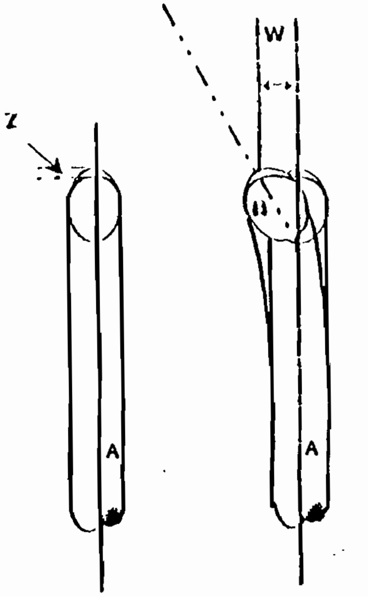
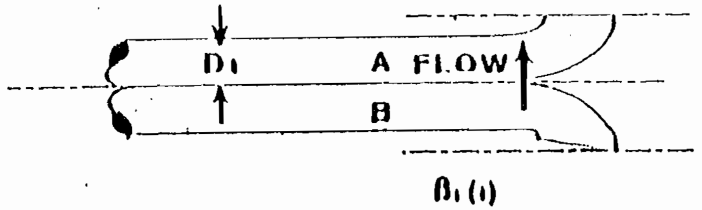
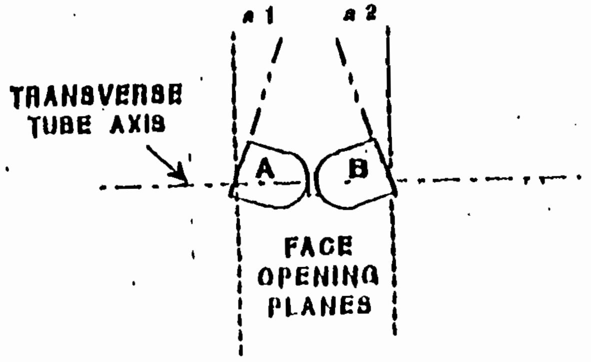
Types of face-opening misalignment that can result from field use or improper construction of type 'S' pitot tubes. These will not affect the baseline value of Cp(s) so long as $\alpha1$ and $\alpha2 < 10°$, $\beta1$ and $\beta2 < 5°$, z 0.32 cm (1/8 in.)

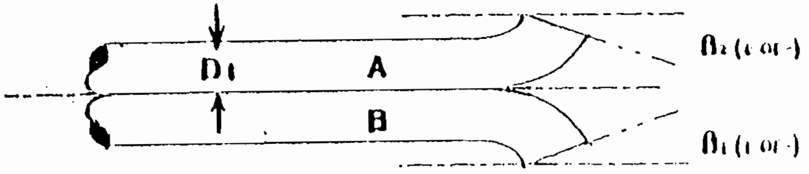












APPENDIX D OPERATIONAL DATA

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST CHRONOLOGY
UNIT # 2
STEADY STATE CONDITIONS
May 10,1996

RUN # 1	START	7:49 a.m.	No problems noted at beginning of run.
	STOP	10:10 a.m.	No problems noted at end of run.
RUN # 2	START	10:31 a.m.	No problems noted at beginning of run.
	STOP	12:40 p.m.	No problems noted at end of run.
RUN # 3	START	1:14 p.m.	No problems noted at beginning of run.
	STOP	3:22 p.m.	No problems noted at end of run.

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 2
STEADY STATE CONDITIONS
May 10, 1996

TIME OF 6 MIN. AVERAGE	OPACITY (%)
(RUN # 1)	(RUN # 1)
7:49 - 7:54	5.3
7:55 - 8:00	4.8
8:01 - 8:06	5.7
8:07 - 8:12	5.8
8:13 - 8:18	4.9
8:19 - 8:24	5.2
8:25 - 8:30	4.8
8:31 - 8:36	5.3
8:37 - 8:42	6.1
8:43 - 8:48	4.9
8:49 - 8:54	5.4
8:55 - 9:00	5.4
9:01 - 9:06	5.1
9:07 - 9:12	5.4
9:13 - 9:18	4.7
9:19 - 9:24	5.5
9:25 - 9:30	5.0
9:31 - 9:36	5.3
9:37 - 9:42	5.4
9:43 - 9:48	4.7
9:49 - 9:54	5.1
9:55 - 10:00	4.8
10:01 - 10:06	5.2
10:07 - 10:10	5.3

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 2
STEADY STATE CONDITIONS
May 10, 1996

(RUN # 2)	(RUN # 2)
10:31- 10:36	5.0
10:37 - 10:42	5.1
10:43 - 10:48	4.6
10:49 - 10:54	5.0
10:55 - 11:00	4.8
11:01 - 11:06	4.9
11:07 - 11:12	5.1
11:13 - 11:18	4.8
11:19 - 11:24	5.1
11:25 - 11:30	4.7
11:31 - 11:36	4.8
11:37 - 11:42	5.4
11:43 - 11:48	4.6
11:49 - 11:54	5.2
11:55 - 12:00	5.0
12:01 - 12:06	5.1
12:07 - 12:12	5.2
12:13 - 12:18	5.3
12:19 - 12:24	5.1
12:25 - 12:30	5.0
12:31 - 12:36	5.2
12:37 - 12:40	5.6

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 2
STEADY STATE CONDITIONS
May 10, 1996

(RUN # 3)	(RUN # 3)
1:14 - 1:18	5.2
1:19 - 1:24	5.4
1:25 - 1:30	5.7
1:31 - 1:36	5.3
1:37 - 1:42	5.5
1:43 - 1:48	4.8
1:49 - 1:54	5.2
1:55 - 2:00	4.9
2:01 - 2:06	5.1
2:07 - 2:12	5.3
2:13 - 2:18	4.9
2:19 - 2:24	5.7
2:25 - 2:30	5.0
2:31 - 2:36	5.1
2:37 - 2:42	5.4
2:43 - 2:48	4.8
2:49 - 2:54	5.2
2:55 - 3:00	5.0
3:01 - 3:06	5.2
3:07 - 3:12	5.6
3:13 - 3:18	4.7
3:19 - 3:22	5.1

Best Available Copy

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # 2

CONDITION: (circle one)

Sootblowing [✓ Steadystate]

RUN NUMBER: 1

Date: 5/10/96

OPERATIONAL DATA FORM

RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS/HR.)					E W PERCENT O2			PERCENT OPACITY	A B I.D. FAN AMPS			
					A	B	C	D	E	A	B	EMS		1	2	3	4
start 1*	0749	1486 KLB/HR	200.9	1,360,000	27,000	27,000	27,000	36,000	32,500	4.59	Out	4.59	4.70%	260	268		
	stop																
stop #1	10:10	1487 kb	201	1350000	27000	29000	27000	36000	33000	4.59	out	4.59	4.70	262	268		

COMMENTS: Coal Integrators

Start	Stop
A 892556	A 893283
B 334389	B 335196
C 826427	C 829059
D 397636	D 398539
E 273184	E 274104

A GAS TEMP (F) AIR PREHEATERS 7 IN	9 out	8 IN B	10 out	PULVERIZER MILLS TEMPERATURES A	E	C	D	E
1	2	3	4	1	2	3	4	5
664	316	672	307	150	150	151	149	150
671	318	680	305	150	151	150	149	150 Stop

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* NOTE RUN 1 HALTED 8:22 - 8:33 DUE TO MILL TRIP.

PCT ATTACHMENT

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST

PLANT SMITH

UNIT # 2

CONDITION: (circle one)

Sootblowing [✓ Steadystate]

START

RUN NUMBER: 1

Date: 5-10-96

PRECIPITATOR READINGS

Hots

Cold

PRECIPITATOR CABINET LOCATION	PRIMARY AMPS	PRIMARY VOLTS	SECONDARY AMPS	SECONDARY VOLTS
A	100	275		
B	100	275		
C	95	310		
D	105	320		
E	100	280		
F	100	305		
G	105	250		
H	125	260		
J	110	265		
K	20	130		
L	105	260		
M	70	255		
INlet	105	545		
INtermediate	76	425		
outlet	68	485		

PCT ATTACHMENT "A"

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST

PLANT SMITH

UNIT # 2

CONDITION: (circle one)

Sootblowing [✓ Steadystate]

RUN NUMBER: 1 STOP

Date: 5-10-96

PRECIPITATOR READINGS

Hots

PRECIPITATOR CABINET LOCATION	PRIMARY AMPS	PRIMARY VOLTS	SECONDARY AMPS	SECONDARY VOLTS
A	100	270		
B	50	265		
C	100	310		
D	45	255		
E	105	280		
F	100	310		
G	110	260		
H	120	260		
J	110	255		
K	20	145		
L	105	255		
M	50	250		

Cold

inlet —	100	545		
Intermediate	86	450		
outlet	72	465		

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # 2

CONDITION: (circle one)

Sootblowing [✓ Steadystate]

RUN NUMBER: 2

Date: 5/10/96

OPERATIONAL DATA FORM

	RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS/HR.)					E W PERCENT O2			PERCENT OPACITY	A B I.D. FAN AMPS			
						A	B	C	D	E	A	B	EMS		1	2	3	4
start	2	10:31	1454 K/W	202	1365000	27000	29000	26000	35000	34000	4.68	out	4.68	5.70	263	270		
stop	2	12:40	1482 K/W	202	1365000	27000	29000	27000	34000	33000	4.23	–	4.23	5.60	263	270		

COMMENTS: Coal Integrators

Start	Stop
A 893388	A 894048
B 335312	B 336045
C 829157	C 829778
D 398670	D 399498
E 274240	E 275099

GAS TEMP (F) A AIR PREHEATERS				PULVERIZER MILLS TEMPERATURES					
7 IN	9 out	8 IN	10 out	A	B	C	D	E	
1	2	3	4	1	2	3	4	5	
671	318	680	305	150	150	150	149	150	→ start
674	319	685	306	150	150	150	144	149	→ stop

PCT ATTACHMENT

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST

PLANT SMITH

UNIT # 2

CONDITION: (circle one)

Sootblowing [✓ Steadystate]

RUN NUMBER: 2 START

Date: 5-10-96

PRECIPITATOR READINGS

	PRECIPITATOR CABINET LOCATION	PRIMARY AMPS	PRIMARY VOLTS	SECONDARY AMPS	SECONDARY VOLTS
Hots	A	100	280		
	B	100	300		
	C	90	300		
	D	52	265		
	E	105	280		
	F	105	300		
	G	110	250		
	H	125	270		
	J	110	250		
	K	20	150		
	L	105	250		
	M	72	258		
Colds					
	INLET	100	540		
	Intermediate	87	450		
	Outlet	64	475		

PCT ATTACHMENT "A"

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # 2

CONDITION: (circle one)
Sootblowing [✓ Steadystate]

RUN NUMBER: 2 [illegible]

Date: [illegible]

PRECIPITATOR READINGS

Hots

PRECIPITATOR CABINET LOCATION	PRIMARY AMPS	PRIMARY VOLTS	SECONDARY AMPS	SECONDARY VOLTS
A	100	275		
B	80	265		
C	115	320		
D	100	310		
E	105	270		
F	120	310		
G	110	260		
H	115	250		
J	115	255		
K	80	[illegible]		
L	100	290		
M	70	250		
Inlet	100	[illegible]		
Intermediate	57	450		
Outlet	72	295		

Cold

PCT ATTACHMENT "A"

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # #2

CONDITION: (circle one)

Sootblowing [✓ Steadystate]

RUN NUMBER: #3

Date: 5/10/96

OPERATIONAL DATA FORM

	RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS./HR.)					E W PERCENT O2			PERCENT OPACITY	A B I.D. FAN AMPS			
						A	B	C	D	E	A	B	EMS		1	2	3	4
start	#3	13:14	1486 KW	201	1365000	27000	28000	26000	35000	33000	4.53	out	4.53	5.40	263	269		
stop	#3	15:22	1480 KW	201	1365000	27000	28000	26000	33000	30000	4.31	out	431	5.30	264	269		

COMMENTS:

GAS TEMP (F) IN 7 OUT 9 AIR PREHEATERS 8 IN 10 OUT				PULVERIZER MILLS A B C D TEMPERATURES E					
1	2	3	4	1	2	3	4	5	
672	318	683	306	150	150	150	143	150	start
671	318	683	306	150	150	149	135	148	stop

PCT ATTACHMENT

BEST AVAILABLE COPY

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST
PLANT Smith
UNIT # 2
CONDITION: (circle one)
Sootblowing [✓ Steadystate]
RUN NUMBER: 3 Start
Date: 5-16-96

PRECIPITATOR READINGS

[illegible]

PRECIPITATOR CABINET LOCATION	PRIMARY AMPS	PRIMARY VOLTS	SECONDARY AMPS	SECONDARY VOLTS
A	105	280		
B	87	280		
C	90	300		
D	80	300		
E	105	270		
[illegible]	120	320		
[illegible]	105	250		
[illegible]	125	260		
[illegible]	100	250		
[illegible]	20	150		
[illegible]	100	250		
[illegible]	70	252		
[illegible]	100	547		
[illegible]	87	452		
[illegible]	60	450		

[illegible]

PCT ATTACHMENT "A"

GULF POWER COMPANY
PARTICULATE COMPLIANCE TEST
PLANT [illegible]
UNIT # 2
CONDITION: (circle one)
Sootblowing Steadystate
RUN NUMBER: 5 [illegible]
Date: [illegible]

PRECIPITATOR READINGS

[illegible]

PRECIPITATOR CABINET LOCATION	PRIMARY AMPS	PRIMARY VOLTS	SECONDARY AMPS	SECONDARY VOLTS
A	107	280		
B	100	312		
C	130	310		
D	140	330		
E	112	280		
F	130	310		
G	120	265		
H	130	270		
I	120	260		
K	20	150		
L	110	260		
M	72	255		
[illegible]	104	545		
[illegible]	90	450		
[illegible]	75	475		

PCT ATTACHMENT "A"

SANDERS ENGINEERING & ANALYTICAL SERVICES, INC.

PARTICULATE EMISSIONS TEST REPORT
SOOT BLOWING OPERATIONS

FOR

GULF POWER COMPANY
Plant Smith, Unit 2
Panama City, Florida

May 9, 1996

1568 LEROY STEVENS ROAD

MOBILE, ALABAMA 36695 • 205/633-4120

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ILLUSTRATIONS

1. INTRODUCTION

Sanders Engineering & Analytical Services, Inc. (SEAS), performed particulate emissions testing at Gulf Power Company, Plant Smith, Unit 2, located in Panama City, Florida. The test was conducted on May 9, 1996, during soot blowing operations. The testing was performed in accordance with the applicable U.S. EPA procedures specified at **40 CFR, Part 60, Appendix A, Methods 1, 2, 3, 4, and 17**.

The purpose of the test was to demonstrate compliance with the rules and regulations of the Florida Department of Environmental Protection, and to meet certain requirements contained in the permit to operate issued by the Florida Department of Environmental Protection.

The test was conducted by Mr. Jack Covington, Mr. Dean Holmes, Mr. John Holcombe, and Mr. John Wilson of Sanders Engineering & Analytical Services, Inc., and was coordinated with Mr. John McPherson of Gulf Power Company. The Florida Department of Environmental Protection was notified so that a representative could be present to observe the testing.

The test was conducted in accordance with the rules and regulations of the Florida Department of Environmental Protection. Further discussion of the test methods are included later in the report.

2. SUMMARY AND DISCUSSION OF RESULTS

The results of the particulate emissions testing for the soot blowing runs, along with the results of the computations, are summarized in Table I. The equations used in the calculation of the results, along with the completed field data sheets, are presented in Appendix A. The sample calculations of the first run are presented in Appendix B. The quality control checks of the equipment used in the sampling program are included in Appendix C.

There were no problems encountered during the performance of the test. The bottom port of each duct was not sampled due to ash build-up in the duct. One of the other ports was alternately sampled twice on each run to compensate for the port not sampled. At the completion of each run, the filter and probe were removed to a relatively clean, draft-free area for clean-up.

The results of the testing indicate the particulate emission rate during soot blowing for Plant Smith, Unit 2, is 0.050 LBS/MMBTU. The applicable Florida Department of Environmental Protection rules and regulations require an emission rate of no greater than 0.30 LBS/MMBTU. The results of the testing indicate that the unit is in compliance with the particulate emission condition of the permit to operate issued by the Florida Department of Environmental Protection.

TABLE I. PARTICULATE EMISSIONS TEST RESULTS
GULF POWER COMPANY
PLANT SMITH, UNIT 2, SOOT BLOWING
5/9/96

Title of Run		RUN 1	RUN 2	RUN 3
Sampling Time -Start	Military	0651	0906	1213
Sampling Time -Stop	Military	0858	1115	1510
F Factor	SDCF/MMBTU	9820	9820	9820
Plant Load	Megawatts	200.0	200.0	200.0
Static Pressure	In. H2O	2.25	2.25	2.25
Barometric Pressure	In. Hg	30.32	30.32	30.32
Average dH	In. H20	0.91	1.03	1.28
Meter correction		1.038	1.038	1.038
Avg. Meter Temp.	Deg. F	80.1	86.2	81.9
% O2	%	7.4	7.3	7.6
%CO2	%	12.0	12.0	12.0
Volume Metered	ACF	63.240	64.200	71.630
Volume Water	Ml	118.5	135.5	130.5
Sampling Time	Minutes	120	120	120
Nozzle Diameter	Inches	0.219	0.234	0.243
Avg. Stack Temp.	Deg. F	342.4	343.5	356.2
Area of Stack	Sq. Feet	253.3400	253.3400	253.3400
Wt. of Part.	Mg.	97.9	30.1	184.8
Number of Points		60	60	60
Avg. Sqrt dP	In. H20	0.7968	0.7377	0.7764

RESULTS OF COMPUTATIONS

		RUN 1	RUN 2	RUN 3	Average
Volume of Gas Sampled	SDCF	65.149	65.423	73.607	
H2O vapor in Gas Stream	PERCENT	7.9	8.9	7.7	8.2
Avg. Stack Gas Velocity	FT/SEC	54.3	50.4	53.3	52.7
Volumetric Flow Rate	SDCFM	509,543	467,284	492,973	489,933
Volumetric Flow Rate	ACF/M	825,004	765,969	810,368	800,447
Particulate Conc.	Grs/SDCF	0.023	0.007	0.039	0.023
Particulate Conc.	Grs/ACF	0.014	0.004	0.024	0.014
Particulate Mass Rate	Lb/Hr	101.1	28.4	163.4	97.6
Particulate Mass Rate	Lb/MMBtu	0.050	0.015	0.085	0.050
Heat Input	MMBTU/Hr	2010.98	1857.86	1916.76	1928.54
Percent of Isokinetic	%	103.2	99.0	97.9	

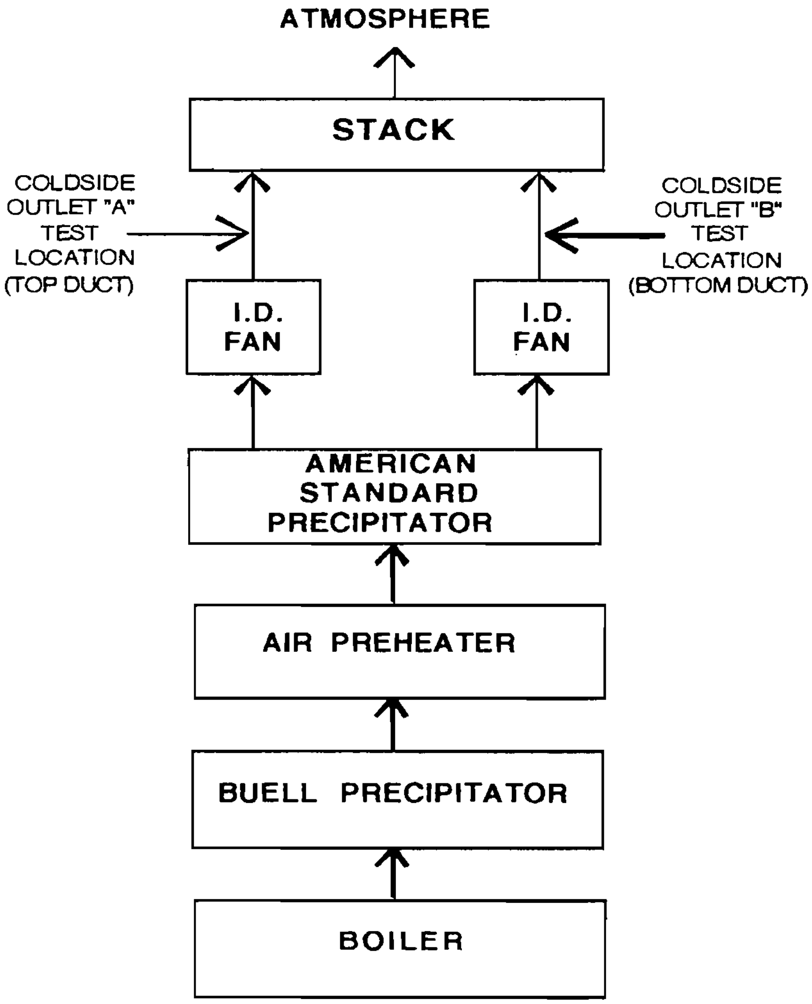
3. PROCESS DESCRIPTION

The process consists of a steam electric generating unit firing bituminous coal for the production of electric energy. The coal is received by either rail, truck, or barge, and loaded directly onto the conveyor feeding the plant, or onto the stockpile and later loaded onto the conveyor belt transporting the coal to the plant. The coal from the conveyor is loaded into bunkers capable of holding between 24 to 36 hours supply of coal. The coal is then fed to pulverizing mills before being fired in the unit through the burners. Upon combustion of the coal in the fire box, approximately 20 percent of the ash falls to the bottom of the boiler and is removed by the ash removal system. The remaining 80 percent exits with the flue gases through the heat exchange and economizer sections of the furnace, and is collected by electrostatic precipitators.

3.1. Source Air Flow

The air flow schematic which depicts the passage of the flue gases exhausted from Plant Smith, Unit 2, is presented in Figure 1.

Figure 1. Air Flow Schematic



3.2. Operation During Testing

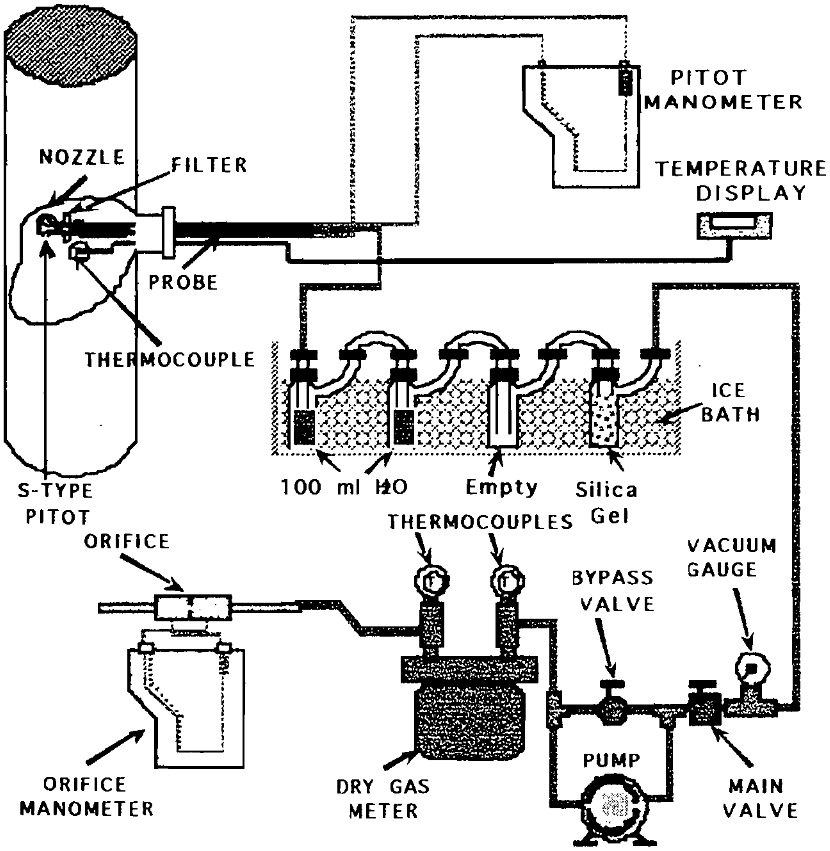
The approximate heat input average during soot blowing operation, as based on F-factor calculations, is 1928.54 million BTU per hour, resulting in the production of approximately 200 megawatts of electricity. Precipitator data supplied by Gulf Power personnel is given in Appendix D.

5. PARTICULATE SAMPLING PROCEDURE (EPA Method 17)

The sampling procedure utilized is that specified in **40 CFR, Part 60, Appendix A, Method 17**. A brief description of this procedure is as follows:

The first impingers were partially filled with 100 milliliters of deionized water. The next impinger was left empty to act as a moisture trap. Preweighed 6 to 16 mesh indication silica gel was added to the last impinger. The sampling equipment manufactured by Lear Siegler (Model 100) or Sanders Engineering (Model 200) was assembled as shown in the attached drawing. The system was leak checked by plugging the inlet to the nozzle and pulling a 15 inch mercury vacuum. A leakage rate not in excess of 0.02 cubic feet per minute was considered acceptable.

Figure 3. Particulate Sampling Train



The inside dimensions of the stack liner were measured and recorded. The required number of sampling points were marked on the probe for easy visibility. The range of velocity pressure, the percent moisture, and the temperature of the effluent

gases were determined. From this data, the correct nozzle size and the nomograph multiplication factor were determined.

Crushed ice was placed around the impingers. The nozzle was placed on the first traverse point with the tip pointing directly into the gas stream. The pump was started immediately and the flow was adjusted to isokinetic sampling conditions. After the required time interval had elapsed, the probe was repositioned to the next traverse point and isokinetic sampling was re-established. This was performed for each point until the run was completed. Readings were taken at each point and recorded on the field data sheet. At the conclusion of each run, the pump was turned off and the final readings were recorded.

5.1. Particulate Sample Recovery

Care was exercised in moving the collection train to the sample recovery area to minimize the loss of collected sample, or the gain of extraneous particulate matter. The volume of water in the impingers was measured, the silica gel impinger was weighed and recorded on the field data sheet. The nozzle, and all sample-exposed surfaces were washed with reagent grade acetone into a clean sample container. A brush was used to loosen any adhering particulate matter and subsequent washings were placed into the container. The filter was carefully removed from the fritted support and placed in a clean separate sample container. A sample of the acetone used in the washing was saved for a blank laboratory analysis.

5.2. Particulate Analytical Procedures

The filter and any loose particulate matter were transferred from the sample container to a clean, tared weighing dish. The filter was placed in a desiccator for at least 24 hours and then weighed to the nearest 0.1 milligram until a constant weight was obtained. The original weight of the filter was deducted, and the weight gain was recorded to the nearest 0.1 milligram.

The wash solution was transferred to a clean, tared beaker. The solution was evaporated to dryness, desiccated to a constant weight, and the weight gain was recorded to the nearest 0.1 milligram.

APPENDIX A EQUATIONS AND FIELD DATA SHEETS

EQUATIONS

1. $$P_s = P_{bar} + \frac{P_g}{13.6}$$

2. $$P_m = P_{bar} + \frac{\overline{\Delta H}}{13.6}$$

3. $$V_s = K_p C_p \overline{\sqrt{\Delta P}} \sqrt{\frac{\overline{T_s}}{M_s P_s}}$$

4. $$V_{m(Std)} = K_1 V_m Y \left[\frac{p_{bar} + \frac{\overline{\Delta H}}{13.6}}{\overline{T_m}} \right]$$

5. $$V_{w(Std)} = 0.04707\ V_{l\,c}$$

6. $$B_{ws} = \frac{V_{w\,(Std)}}{V_{m(Std)} + V_{w\,(Std)}}$$

7. $$M_d = 0.44\ (\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%N_2 + \%CO)$$

8. $$M_s = M_d(1 - B_{ws}) + 18\ (B_{ws})$$

9. $$EA = \left[\frac{(\%O_2 - 0.5\ (\%CO))}{0.264\ (\%N_2) - ((\%O_2) - 0.5\ (\%CO))} \right] 100$$

10. $$Q_a = (V_s)(A_s)(60)$$

11. $$Q_s = Q_a\,(1-B_{ws})\,\frac{(528)}{\overline{T}_s}\,\frac{(P_s)}{29.92}$$

12. $$E_H = \left(\frac{PMR}{H_I}\right)$$

13. $$E = C_d\,F_{O_2}\left(\frac{20.9}{20.9 - \%O_2}\right)$$

14. $$C_s = 0.0154\,\frac{M_n}{V_{m(Std)}}$$

15. $$C_{50} = \frac{21\ C_s}{21 - [(1.5)\ (\%O_2) - 0.133\ (N_2) - 0.75\ (\%CO)]}$$

16. $$C_{12} = \frac{C_s\ (12)}{\%CO_2}$$

17. $$PMR = (C_s)(Q_s)\,\frac{(60)}{7000}$$

18. $$V_n = \left[(0.002669)\ (V_{1c}) + \frac{V_m Y}{\overline{T}_m}\left(p_{bar} + \frac{\overline{\Delta H}}{13.6}\right)\right]\frac{\overline{T}_s}{P_s}$$

19. $$I = \frac{100\ V_n}{(60)\ \text{Ø}\ V_s\ A_n}$$

NOMENCLATURE

A_n = Cross-sectional area of nozzel, ft^2

A_s = Cross sectional area of stack, ft^2

B_{ws} = Wator vapor in the gas stream, proportion by volume (dimensionless)

C_p = Pitot tube coefficient (dimensionless) (0.84)

C_s = Particulate concentration, grains/SDCF

C_d = Particulate concentration, lbs/SDCF

C_{12} = Particulate concentration (C_s adjusted to 12% CO) grains/SDCF

C_{50} = Particulate concentration (C_s adjusted to 50% excess air) grains/SDCF

EA = Excess air, %

E = Emission in lb/mmBTU

E_H = Emission in lb/mmBTU, based on heat input

H_I = Total Heat Input, Million BTU per Hour (MMBTU/hr)

I = Percent of isokinetic sampling

K_1 = 17.64 °R/ inches Hg

K_p = Pitot tube constant,

$$85.49 \text{ ft/sec} \left[\frac{(\text{lb/lb-mole})\ (\text{in. Hg})}{(^\circ\text{R})\ (\text{inc. } H_2O)}\right]^{\frac{1}{2}}$$

M_n = Total amount of particulate collected, mg

M_d = Molecular weight of stack gas; dry basis, lb/lb mole

M_s = Molecular weight of stack gas; wet basis, lb/lb mole

P_{bar} = Barometric pressure at the sampling site, in. Hg

NOMENCLATURE (continued)

P_m = Meter pressure, in. Hg

P_s = Absolute stack pressure, in. Hg

P_g = Stack static pressure, in. H_2O

PMR = Particulate mass rate, lb/Hr

Q_a = Volumetric flow rate ACFM

Q_s = Volumetric flow rate SDCFM

V_s = Average stack gas velocity, ft/sec

V_{lc} = Total volume of liquid collected in impingers & silica gel, ml

V_m = Volume of gas sample as measured by dry gas meter, ACF

$V_{m(std)}$ = Volume of gas sample measured by dry gas meter, corrected to standard conditions, SDCF

$V_{w(std)}$ = Volume of water vapor in gas sample, corrected to standard conditions, SCF

V_n = Volume collected at stack conditions through nozzle, ACF

Y = Dry gas meter calibration factor (dimensionless)

ΔH = Average pressure difference of orifice, in. H_2O

ΔP = Velocity head of stack gas, in. H_2O

$\overline{\sqrt{\Delta P}}$ = Average of square roots of the velocity pressure, in. H_2O

Ø = Total sampling time, minutes

$\%CO_2$, $\%O_2$, N_2, %CO - Number % by volume, dry basis, from gas analysis

F_{O_2} = Oxygen based F factor (9820 SDCF/mmBTU for bituminous coal)

T_s = Temperature of the stack, °R (° F + 460)

SANDERS ENGINEERING & ANALYTICAL SERVICES, Inc.

1568 Leroy Stevens Rd.
Mobile, AL 36695

Office: (205) 633-4120
FAX#: (205) 633-2285

FIELD DATA SHEET

COMPANY Gulf Power Co
DATE 5-9-96
METER BOX S-100
PLANT/(UNIT) Smith
OPERATOR JC
ΔHa 75 cu. ft. /min.
LOCATION Unit #2 Soot Blowing
METHOD 17
PROBE ______ liner/length

RUN 1

NOMOGRAPH

Km ______ Tm ______
Noz ______ Ts ______
H₂O ______ PsPm ______

NOZZLE CALIBRATION

PRE	POST
.219	219
219	219
219	219
219	219
AVERAGE	AVERAGE

FILTER 1391

METER READING

91.940 FINAL
28.700 INITIAL
63.240 NET

______ FINAL
______ INITIAL
______ NET

LEAK CHECK

SYSTEM

Pre	Post
✓ in. Hg	20 in. Hg
✓ cfm	.003 cfm

PITOT

Pre	Post
☑ impact	☑ impact
☑ static	☑ static

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	198	110	0	1500.0
INITIAL	100	100	0	1489.5
NET	98	10	0	10.5

TOTAL 118.5

GAS ANALYSIS

O_2 7.4
CO_2 12.0
CO ______

STATIC +2.25 in. H_2O

BAROMETRIC 30.32 in. Hg

RUN 2

NOZZLE CALIBRATION

PRE	POST
234	234
234	234
234	234
234	234
AVERAGE	AVERAGE

FILTER 1392

METER READING

557.200 FINAL
493.000 INITIAL
64.200 NET

______ FINAL
______ INITIAL
______ NET

LEAK CHECK

SYSTEM

Pre	Post
✓ in. Hg	21" in. Hg
✓ cfm	007 cfm

PITOT

Pre	Post
☑ impact	☑ impact
☑ static	☑ static

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	222	100	0	1511.5
INITIAL	100	100	0	1498.0
NET	122	0	0	13.5

TOTAL 135.5

GAS ANALYSIS

O_2 7.3
CO_2 12.0
CO ______

STATIC 2.25 In. H_2O

BAROMETRIC 30.32 in. Hg

RUN 3

NOZZLE CALIBRATION

PRE	POST
.243	243
.243	243
.243	243
243	243
AVERAGE	AVERAGE

FILTER 1393

METER READING

130.030 FINAL
58.400 INITIAL
71.630 NET

______ FINAL
______ INITIAL
______ NET

LEAK CHECK

SYSTEM

Pre	Post
✓ in. Hg	18 in. Hg
✓ cfm	.010 cfm

PITOT

Pre	Post
☑ impact	☑ impact
☑ static	☑ static

VOLUME OF LIQUID WATER COLLECTED

	IMP. 1	IMP. 2	IMP. 3	IMP. 4
FINAL	220	150	0	1491.5
INITIAL	100	150	0	1481.0
NET	120	0	0	10.5

TOTAL 130.5

GAS ANALYSIS

O_2 7.6
CO_2 12.0
CO ______

STATIC +2.25 In. H_2O

BAROMETRIC 30.32 in. Hg

200 mw

7:30

Port # / Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F) Stack	Probe	Hot Box	Imp.	Gas Meter In	Gas Meter Out	Vac. in. H_g
10-1	6:51	28.700	.27	.40	350			✓	74	73	3
2	:53	29.600	.58	.83	350			65	74	73	3
3	:55	30.700	.27	.39	350			✓	74	73	3
4	:57	31.400	.57	.39	350			✓	77	74	3
5	:59	32.100	.94	1.35	350			✓	77	74	5
6	:01	33.300	1.25	1.79	350			✓	77	73	6
9-1	7:04	34.700	.52	.75	350			63	77	73	3
2	:06	36.000	.46	.66	350			✓	79	75	3
3	:08	36.700	.63	.90	350			✓	79	75	4
4	:10	37.800	1.04	1.49	350			✓	81	75	5
5	:12	39.200	.72	1.03	348			✓	82	75	4
6	:14	40.100	.82	1.18	346			✓	82	75	4
8-1	7:17	41.300	.65	.93	349			62	82	76	4
2	19	42.400	.62	.88	349			✓	82	76	4
3	:21	43.700	.42	.57	349			✓	82	76	4
4	:23	44.300	.77	1.05	349			✓	82	77	5
5	:25	45.500	.63	.87	349			✓	82	77	5
6	:27	46.400	.36	.50	349			✓	82	77	5
7-1	7:30	47.700	.67	.92	349			58	83	77	5
2	:32	48.800	.35	.48	349			✓	83	77	3
3	:34	~~50.000~~ 49.600	.62	.86	350			✓	83	77	3
4	:36	50.500	.82	1.13	350			✓	83	77	3
5	:38	51.700	.78	1.08	350			✓	83	77	3
6	:40	52.700	.97	1.34	348			✓	83	77	5
6-1	:42	54.200	.84	1.16	351			56	84	78	5
2	:44	55.200	.66	.91	350			✓	84	78	5
3	:46	56.400	.63	.87	350			✓	84	78	5
4	:48	57.400	.86	1.19	350			✓	84	78	5
5	:50	58.600	.88	1.21	350			✓	84	78	5
6	:52	59.[illegible]00	.86	1.19	350			✓	84	78	5
5-1	7:56	61.000	.27	.37	336			58	83	79	3
2	158	61.800	.40	.56	337			✓	83	79	3

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co

Date 5-9-96

Site Smith Unit 2

Run # 1

S.B.

Page ____ Of ____

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)						Vac. in. H_g
					Stack	Probe	Hot Box	Imp.	Gas Meter In	Gas Meter Out	
5-3	8:00	62.600	.63	.89	337			58	82	79	5
4	:02	63.700	.77	1.09	337			✓	82	79	5
5	:04	64.700	.85	1.19	337			✓	82	79	5
6	:06	66.230	.77	1.08	336			✓	84	79	5
4-1	8:09	67.200	.46	.65	336			56	84	79	5
2	:11	68.200	.46	.65	336			✓	84	79	5
3	:13	69.400	.67	.94	336			✓	84	79	5
4	:15	70.150	.72	1.01	336			✓	84	79	5
5	:17	71.250	.62	.87	336			✓	84	79	5
6	:19	72.300	.66	.93	335			✓	84	79	5
3-1	8:21	73.300	.62	.87	334			57	84	80	5
2	:23	74.400	.56	.79	335			✓	84	80	5
3	:25	75.500	.40	56	335			✓	84	80	5
4	:27	76.100	.56	.78	336			✓	84	80	5
5	:29	77.200	.66	.93	335			✓	84	80	5
6	:31	78.100	.50	.70	335			✓	84	80	5
2-1	8:34	79.100	.38	.53	334			58	84	80	4
2	:36	79.900	.~~68~~.44	.62	334			✓	84	80	5
3	:38	80.600	.72	1.01	335			✓	84	80	5
4	:40	81.700	.82	1.15	335			✓	84	80	5
5	:42	82.950	.93	1.31	334			✓	84	80	7
6	:44	84.300	.93	1.31	334			✓	84	80	7
2-1	:46	85.400	.48	.68	334			56	84	80	7
2	:48	86.700	.42	.59	334			✓	84	80	7
3	:50	87.300	.42	.59	334			✓	84	80	7
4	:52	88.300	.88	1.24	334			✓	85	81	7
5	:54	89.400	1.00	1.41	335			✓	85	81	8
6	:56	90.900	.89	1.25	334			✓	87	81	7
	8:58	91.940									

.7987 .914

Check Indicates Temperatures Meet Required Limits.

80.1

Company Gulf Power Co

Date 5-9-96

Site Smith Unit 2

Run # 1

S.B.

Page ______ Of ___

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)						Vac. in. H_g
					Stack	Probe	Hot Box	Imp.	Gas Meter In	Gas Meter Out	
2- 1	9:06	493.000	.42	.77	334			67	84	82	4
2	:08	493.900	.47	.88	334			✓	84	82	3
3	:10	495.200	.51	.93	335			✓	84	82	4
4	:12	496.200	.88	1.61	335			✓	84	82	5
5	:14	497.600	.93	1.72	335			✓	87	82	5
6	:16	498.800	.74	1.36	334			✓	87	82	5
3- 1	9:19	500.110	.43	.79	335			65	87	82	3
2	:21	501.100	.61	1.13	335			✓	87	82	3
3	:23	502.080	.46	.85	336			✓	87	83	3
4	:25	503.700	.62	~~.85~~ 1.15	336			✓	87	83	3
5	:27	504.200	.62	1.15	335			✓	88	83	4
6	:29	505.100	.42	.77	333			✓	88	83	4
3-1	9:31	506.000	.43	79	333			✓	88	83	4
2	:33	507.100	.40	74	336			62	87	83	4
3	:35	508.200	.52	.96	336			✓	87	83	4
4	:37	508.900	.38	.70	336			✓	88	83	4
5	:39	~~509~~ 510.000	.36	.67	336			✓	88	83	3
6	:41	511.100	.22	.40	336			✓	88	83	3
4-1	9:45	511.740	.32	.59	337			61	88	83	3
2	:47	512.600	.48	.88	337			✓	88	83	4
3	:49	513.600	.72	1.33	337			✓	88	83	4
4	:51	514.950	.70	1.29	337			✓	88	83	5
5	:53	515.950	.55	1.01	337			✓	88	83	5
6	:55	517.100	.72	1.33	336			✓	88	83	5
5-1	:57	518.300	.28	.52	337			59	88	84	3
2	:59	519.100	.42	.77	338			✓	88	84	3
3	10:01	520.200	.65	1.20	337			✓	88	84	5
4	:03	521.400	.72	1.33	337			✓	88	84	5
5	:05	522.400	.77	1.42	337			✓	88	84	5
6	:07	523.500	.83	1.53	337			✓	88	84	6
7-1	10:11	524.900	.64	1.18	349			60	88	84	4
2	:13	526.000	~~.66~~ .70	1.27	351			✓	88	84	4

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co Date 5-9-98

Site Smith Unit 2 Soot Blowing Run # 2 Page ____ Of ___

⊗

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)						Vac. in. H_g
					Stack	Probe	Hot Box	Imp.	Gas Meter In	Gas Meter Out	
7-3	10:15	526.900	.68	1.23	351			61	89	84	6
4	:17	528.200	.83	1.51	352			✓	89	84	6
5	:19	529.500	.82	1.49	351			✓	89	84	6
6	:21	530.600	.80	1.45	351			✓	89	84	6
8-1	10:24	531.950	.77	1.39	351			✓	89	85	6
2	:26	533.250	.56	1.02	352			61	90	85	6
3	:28	534.400	.42	.76	352			✓	90	85	5
4	:30	535.300	.44	.80	352			✓	90	85	5
5	:32	536.400	.42	.76	352			✓	90	85	5
6	:34	537.500	.42	.76	350			✓	90	85	5
8-1	10:36	538.300	.60.62	1.12	351			61	90	85	6
2	:38	539.800	.52	.94	351			✓	90	85	5
3	:40	540.800	.42	.76	352			✓	90	85	5
4	:42	541.450	.13	.24	350			✓	90	85	4
5	:44	542.200	.22	.39	351			✓	90	85	4
6	:46	542.900	.34	.62	350			✓	90	85	5
9-1	10:49	543.700	.69	1.31	352			56	90	85	6
2	:51	544.700	.53	.96	353			✓	90	85	6
3	:53	545.900	.57	1.03	352			✓	90	85	6
4	:55	546.900	.89	1.61	352			✓	90	85	7
5	:57	548.400	.84	1.52	352			✓	90	85	7
6	:59	549.700	.58	1.05	350			✓	90	85	6
10-1	11:03	550.100	.37	.67	352			✓	90	85	5
2	:05	551.900	.32	.58	351			✓	90	85	5
3	:07	552.700	.15	.27	351			✓	90	85	3
4	:09	553.350	.56	1.01	351			✓	90	85	7
5	:11	554.200	.96	1.74	351			✓	90	85	8
6	:13	555.600	1.13	2.05	351			✓	90	85	8
	11:15	557.200									

.7377 1.034

Check Indicates Temperatures Meet Required Limits.

86.16

Company Gulf Power Co

Date 5-9-96

Site Smith Unit 2

Run # 2

5.8.

Page _____ Of ____

Port # Point #	Time	Gas Meter Vol. (cu. ft.)	Vel. Head ΔP in. H_2O	Orifice Head ΔH in. H_2O	Temperature (F)						Vac. in. H_g
					Stack	~~Probe~~	~~Hot Box~~	Imp.	Gas Meter In	Gas Meter Out	
10-1	12:13	58.400	.32	.68	363			64	80	80	4
2	:15	59.400	.11	.23	363			✓	80	80	4
3	:17	60.400	.14	.30	363			✓	80	80	4
4	:19	61.200	.36	.74	363			✓	80	80	4
5	:21	62.000	.88	1.81	363			✓	81	80	7
6	:23	63.300	.92	1.90	363			✓	82	80	7
9-1	12:26	64.900	.52	1.07	361			54	82	80	5
2	:28	66.100	.52	1.07	361			✓	82	80	5
3	:30	67.100	.56	1.15	361			✓	82	80	5
4	:32	68.400	.85	1.76	361			✓	82	80	7
5	:34	~~68~~ 69.600	.87	1.79	360			✓	82	80	7
6	:36	71.200	.77	1.59	360			✓	86	80	8
9-1	12:38	72.500	.49	1.01	361			54	86	80	5
2	:40	73.600	.54	1.11	360			✓	86	80	6
3	:42	74.700	.60	1.24	360			✓	86	80	6
~~4~~ 5	:44	76.140	.62	1.28	359			✓	86	80	6
~~5~~ 4	:46	77.200	.82	1.90	360			59	87	81	8
6	:48	78.300	.64	1.32	360			✓	87	81	7
8-1	12:52	79.800	.77	1.59	360			✓	87	81	7
2	:54	81.150	.70	1.45	360			✓	87	81	7
3	:56	82.600	.36	.74	360			✓	87	81	5
4	:58	83.400	.65	1.34	360			✓	87	81	5
5	13:00	84.300	.56	1.15	359			✓	87	81	6
6	:02	85.000	.57	1.17	359			✓	87	81	6
7-1	13:53	~~85.500~~ ~~86.500~~	.67	1.38	372			✓61	80	~~80~~ 79	7
2	:55	87.800	.68	1.40	373			✓	80	79	7
3	:57	89.000	.68	1.40	373			✓	80	79	7
4	:59	90.200	.89	1.83	377			✓	80	79	8
5	14:01	91.700	.96	1.98	372			✓	82	79	8
6	:03	93.500	.86	1.77	365			✓	82	79	8
5-1	14:07	94.600	.52	1.07	359			58	82	79	6
2	:09	95.600	.42	.87	356			✓	82	79	6

13:04-13:53 Rain Delay

Check Indicates Temperatures Meet Required Limits.

Company Gulf Power Co

Date 5-9-96

Site Smith Unit 2 Soot Blowing

Run # 3 S.B.

Page ______ Of ___

Port #		Gas Meter	Vel. Head	Orifice Head	Temperature (F)						Vac.
		Vol.	ΔP	ΔH			Hot		Gas Meter		in. H_g
Point #	Time	(cu. ft.)	in. H_2O	in. H_2O	Stack	Probe	Box	Imp.	In	Out	
5-3	14:11	~~[illegible]~~ 96.900	.68	1.40	355			60	83	79	6
4	:13	98.300	.73	1.50	354			✓	83	79	6
5	:15	99.700	.92	1.90	361			✓	84	79	8
6	:17	100.800	.82	1.69	355			✓	84	79	8
4-1	14:20	102.250	.46	.95	340			59	84	79	5
2	:22	103.300	.46	.95	355			✓	84	80	5
3	:24	104.500	.66	1.36	356			✓	84	80	5
4	:26	105.800	.66	1.36	354			✓	84	80	7
5	:28	106.900	.57	1.17	353			✓	84	80	7
6	:30	108.100	~~.70~~ .63	~~1.44~~ 1.30	353			✓	84	80	7
4-1	14:32	109.400	.47	.97	353			✓ 58	84	80	7
2	:34	110.400	.47	.97	353			✓	84	80	6
3	:36	111.500	.66	1.36	353			✓	84	80	6
4	:38	112.500	.70	1.44	351			✓	84	80	6
5	:40	113.700	.52	1.07	347			✓	85	80	6
6	:42	114.980	.72	1.49	347			✓	85	80	8
3-1	14:45	116.350	.43	.88	339			57	85	80	5
2	:47	117.600	.52	1.07	347			✓	85	80	5
3	:49	118.200	.57	1.17	347			✓	85	80	5
4	:51	119.200	.61	1.26	347			✓	85	80	5
5	:53	120.500	.61	1.26	345			✓	85	80	7
6	:55	121.600	.48	.99	342			✓	85	80	7
2-1	14:58	122.650	.42	.86	341			~~59~~ 57	85	81	5
2	15:00	123.500	.46	.95	343			✓	85	81	5
3	:02	124.500	.46	.95	344			✓	85	81	6
4	:04	125.800	.77	1.59	344			✓	85	81	6
5	:06	127.000	.92	1.90	342			✓	85	81	6
6	:08	128.900	.87	1.79	342			✓	85	81	6
	15:10	130.030	.								

.7764 1.277 356.23 Check Indicates Temperatures Meet Required Limits.

81.9

Company Gulf Power Co Date 5-9-96

5.8.

Site Smith Unit 2 Soot Blowing Run # 3 Page ___ Of ___

LABORATORY ANALYSIS & CHAIN OF CUSTODY

COMPANY/PLANT: Gulf Power - Plant Smith

UNIT #: 2 DATE OF TEST: 5-9-96 TYPE OF TEST: ☐ M-5 ☒ M-17 ☐ OTHER ______

SAMPLE #	RELINQUISHED BY	RECEIVED BY	TIME	DATE	REASON FOR CHANGE
3 Filters				5-15-96	To Lab
3 Wash					No change

UNIT # 2 - Soot Blowing

RUN # 1	FILTER # 1391	BEAKER # 10 WASH (ML) 45
FINAL WEIGHT	207.0	63827.3
INITIAL WEIGHT	122.8	63813.6
DIFFERENCE	84.2	13.7
CORRECTED TOTAL WEIGHT		97.9
RUN # 2	FILTER # 1392	BEAKER # 28 WASH (ML) 40
FINAL WEIGHT	144.8	67791.8
INITIAL WEIGHT	121.4	67785.1
DIFFERENCE	23.4	6.7
CORRECTED TOTAL WEIGHT		30.1
RUN # 3	FILTER # 1393	BEAKER # 42 WASH (ML) 50
FINAL WEIGHT	291.6	64660.5
INITIAL WEIGHT	124.4	64642.9
DIFFERENCE	167.2	17.6
CORRECTED TOTAL WEIGHT		184.8
RUN # ____	FILTER # ____	BEAKER # ____ WASH (ML) ____
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		

UNIT # ______

RUN # ____	FILTER # ____	BEAKER # ____ WASH (ML) ____
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
RUN # ____	FILTER # ____	BEAKER # ____ WASH (ML) ____
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
RUN # ____	FILTER # ____	BEAKER # ____ WASH (ML) ____
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTED TOTAL WEIGHT		
WASH SOLVENT BLANK (ML) ____		BEAKER # ____ WASH (ML) ____
FINAL WEIGHT		
INITIAL WEIGHT		
DIFFERENCE		
CORRECTION FACTOR (MG/ML)		

ALL WEIGHTS ARE IN MILLIGRAMS (MG)

APPENDIX B SAMPLE CALCULATIONS

Input and Constants

$$f := \frac{9820\ ft^3}{mm\ btu}$$

$pg := 2.25\ in.\ H2O$

$pbar := 30.32\ in.\ Hg.$

$\Delta havg := 0.91\ in.\ H2O$

$y := 1.038$

$tm := 80.1\ {}^{\circ}F$

$o2 := 7.4$

$co2 := 12.$

$vm := 63.24\ ft^3$

$vlc := 118.5\ ml$

$theta := 120\ min$

$nozdia := 0.219\ in.$

$ts := 342.4\ {}^{\circ}F$

$as := 253.34\ ft^2$

$mn := 97.9\ mg$

$numberofpoints := 60$

$sqrt\Delta p := 0.7968\ in.\ H2O^{0.5}$

$$kp := \frac{85.49\ 1\ ft\ 1\ \left(\frac{lb\ in.\ Hg.}{lb\text{-}mole\ {}^{\circ}R\ in.\ H2O}\right)^{0.5}}{1\ sec}$$

$cp := 0.84$

$$k1 := \frac{17.64\ {}^{\circ}R}{in.\ Hg.}$$

$$ts = \frac{(ts + 460\ °F)\ °R}{°F}$$

802.4 °R

$$tm = \frac{(tm + 460\ °F)\ °R}{°F}$$

540.1 °R

$$n2 = 100 - o2 - co2$$

80.6

$$an = \frac{nozdia^{2}\ 3.1416}{4\ \left(\frac{12\ in.}{ft}\right)^{2}}$$

$0.000261587\ ft^{2}$

Calculations

Equation 1

$$ps = pbar + \frac{pg}{\frac{13.6\ in.\ H2O}{1\ in.\ Hg.}}$$

30.4854 in. Hg.

Equation 2

$$pm = pbar + \frac{\Delta havg}{\frac{13.6\ in.\ H2O}{in.\ Hg.}}$$

30.3869 in. Hg.

Equation 3

$$vmstd = \frac{k1\ vm\ y\ \left(pbar + \frac{\Delta havg}{\frac{13.6\ in.\ H2O}{in.\ Hg.}}\right)}{tm}$$

$65.1479\ ft^3$

Equation 4

$$vwstd = \frac{0.04707\ ft^3\ vlc}{ml}$$

$5.57779\ ft^3$

Equation 5

$$bws = \frac{vwstd}{vmstd + vwstd}$$

0.0788652

Equation 6

$$\mathbf{md} = \frac{(0.44\ co2 + 0.32\ o2 + 0.28\ n2)\ lb}{lb\text{-}mole}$$

$$\frac{30.216\ lb}{lb\text{-}mole}$$

Equation 7

$$\mathbf{ms} = md\ (1 - bws) + \frac{bws\ 18\ lb}{lb\text{-}mole}$$

$$\frac{29.2526\ lb}{lb\text{-}mole}$$

Equation 8

$$\mathbf{vs} = kp\ cp\ sqrt\Delta p\ \left(\frac{ts}{ms\ ps}\right)^{0.5}$$

$$\frac{54.2764\ ft}{sec}$$

Equation 9

$$\mathbf{qa} = \frac{vs\ as\ 60\ sec}{min}$$

$$\frac{825023.\ ft^{3}}{min}$$

Equation 10

$$\mathbf{qs} = \frac{qa\ (1 - bws)\ 528\ {}^{\circ}R\ ps}{ts\ 29.92\ in.\ Hg.}$$

$$\frac{509522.\ ft^{3}}{min}$$

Equation 11

$$cs = \frac{0.0154\ gr\ mn}{mg\ vmstd}$$

$$\frac{0.0231421\ gr}{ft^{3}}$$

Equation 12

$$pmr = \frac{cs\ qs\ 60\ min}{hour\ \frac{7000\ gr}{lb}}$$

$$\frac{101.069\ lb}{hour}$$

Equation 13

$$e = \frac{cs\ f\ 20.9\ 1\ lb}{(20.9 - o2)\ 7000\ gr}$$

$$\frac{0.0502608\ lb}{mm\ btu}$$

Equation 14

$$vn = \frac{ts\ \left(\frac{0.002669\ in.\ Hg.\ ft^{3}\ vlc}{ml\ {}^{\circ}R} + \frac{vm\ y\ pm}{tm}\right)}{ps}$$

$$105.532\ ft^{3}$$

Equation 15

$$i = \frac{100\ \%\ vn}{\frac{60\ sec\ theta\ vs\ an}{min}}$$

103.234 %

Equation 16

$$hi = \frac{pmr}{e}$$

$$\frac{2010.9\ mm\ btu}{hour}$$

APPENDIX C QUALITY CONTROL

INITIAL
METER CALIBRATION FORM - DGM

DATE: 12-10-95 Box No. S-100

Ref. DGM Ser. # 1044453 Calibrated By JACK COVINGTON

RUN #	1	2	3	4	5
DELTA H (DGM)	0.50	1.00	1.50	2.00	3.00
Y (Ref. DGM)	1.014	1.014	1.014	1.014	1.014
Reference DGM					
Gas Vol. Initial	10.000	16.400	22.000	28.500	34.600
Gas Vol. Final	15.800	21.600	28.000	34.000	40.800
Meter Box DGM					
Gas Vol. Initial	90.495	96.775	102.265	108.630	114.610
Gas Vol. Final	96.195	101.880	108.140	114.015	120.650
Reference DGM					
Temp.	Avg.	Avg.	Avg.	Avg.	Avg.
Deg F Initial	68	69	68	69	70
Deg F Final	69	68	69	70	69
Meter Box DGM					
Temp. Initial In	68	72	75	78	79
Temp. Initial Out	66	68	69	71	71
Temp. Final In	72	75	77	79	80
Temp. Final Out	68	69	70	71	72
P Bar IN. Hg	30.08	30.08	30.08	30.08	30.08
Time (sec.)	849	549	524	418	390
Meter Calibration Factor (Y)	1.031	1.035	1.040	1.041	1.045
Qm (C.F.M.)	0.418	0.579	0.700	0.803	0.970
Km (Std Pressure)	0.759	0.743	0.733	0.727	0.717
DELTA Ha	1.62	1.68	1.72	1.74	1.78
Average Y (Meter Calibration Factor				1.038	
Average Km (Standard Pressure)				0.736	
Average DELTA Ha of Orifice				1.706	

Y= ≤ .03
Max & Min ≤ .02 from Avg
Final Avg within 5% of Initial Avg
ΔHa = Max & Min ≤ .2 from Avg

POST TEST QUALITY ASSURANCE

Date: 5/16/96

BOX #: **S-100**

Ref. Meter: 1044453

Calibrated By: **JACK COVINGTON**

DRY GAS METER

	Unit	Run 1	Run 2	Run 3
FIELD METER **ΔH**	In. H_2O	1.50	1.50	1.50
Initial Gas Volume	Ft.^{3}	56.400	61.700	69.000
Final Gas Volume	Ft.^{3}	61.700	69.000	120.155
Initial Temp. In	°F	76	76	76
Initial Temp. Out	°F	76	77	78
Final Temp. In	°F	73	73	73
Final Temp. Out	°F	72	72	72
REF. METER Y	*Dimensionless*	1.014	1.014	1.014
Initial Gas Volume	Ft.^{3}	18.540	23.788	31.040
Final Gas Volume	Ft.^{3}	23.788	31.040	81.700
Initial Temp.	°F	77	85	91
Final Temp.	°F	73	79	85
Barometric Pressure	In. Hg	30.01	30.01	30.01
Time	sec	465	644	4502
Meter Calibration Factor	*Dimensionless*	0.999	0.990	0.976
$\Delta H_@$	In. H_2O	1.801	1.855	1.898
Average Y	*Dimensionless*	0.988		
Initial Y	*Dimensionless*	1.038		
Percent Error	%	-4.8	*(Allowed 5.0%)*	

DIFFERENTIAL PRESSURE GAUGE

Ref. Pressure in H_2O	Magnehelic Pressure in H_2O	Percent Error (+/- 5%)
0.00	0.00	0
0.75	0.76	1.333333333
0.39	0.39	0

TEMPERATURE SENSOR

Ref. Temp. (°F)	Thermocouple Temp. (°F)	Percent Error (Allowed 1.5% of Absolute)
280	279	-0.14

ARENOID BAROMETER

Reference Barometer	Test Barometer	0.1 Diff. Allowed
30.01	30.08	0.07

MAGEHELIC CALIBRATION

BOX	2879	S-100	C-133	C-175	S-102	S-101	S-103
SER. NO.		91126AM91	9126AM91	R90125MR6	R74D	R22D	R20208A617
RANGE	0-2	0-2	0-2	0-2	0-5	0-2	0-2
REFERENCE READING		FIELD DEVICE READING					
0.000		0.00	0.00	0.00	0.00	0.00	0.00
0.050							
0.150							
0.200							
0.250							
0.450							
0.50	0.50	0.51	0.50	0.51	0.51	0.50	0.50
1.00	0.99	1.01	0.98	1.01	1.01	0.98	1.01
1.30							
1.80	1.80	1.82	1.79	1.82	1.81	1.79	1.82
2.50							
4.50							
5.0							
9.0							
13.0							
22.0							

SIGNATURE: Edward L. Harris

DATE: 12-5-95

MAGEHELIC CALIBRATION

BOX #1

SER. NO.	10720- AB68	R1061- 6AG48	R5031- SEB76	R1062- 9JA82	R1051- 3MR42	R90124 RI119	
RANGE	0-0.25	0-0.50	0-2	0-5	0-10	0-25	
REFERENCE READING			FIELD DEVICE READING				
0.000	0.000	0.000	0.000	0.000	0.000	0.000	
0.050	0.050						
0.150	0.150	0.140					
0.200	0.190						
0.250		0.250					
0.450		0.450					
0.50			0.50				
1.00			1.00				
1.30				1.30			
1.80			1.80				
2.50				2.50	2.48		
4.50				4.50			
5.0					5.0	5.0	
9.0					9.02		
13.0						13.0	
22.0						22.0	

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION

BOX #2

SER. NO.	10819-DR2	R1090-2AG18	R50315-EB93	R1062-9TA87	30830-AM79	R1072-2MC5
RANGE	0-0.25	0-0.50	0-2	0-5	0-10	0-25
REFERENCE READING	FIELD DEVICE READING					
0.000	0.000	0.000	0.00	0.00	0.0	0.0
0.050	0.050					
0.150	0.155	0.152				
0.200	0.205					
0.250		0.256				
0.450		0.456				
0.50			0.52			
1.00			1.04			
1.30				1.32		
1.80			1.83			
2.50				2.55	2.49	
4.50				4.50		
5.0					4.9	5.2
9.0					8.8	
13.0						12.9
22.0						22.0

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION

BOX #3

SER. NO.	R10908AG71 MRR1	R0112642	R10608CF20 CF20
RANGE	0-0.50	0-2.0	0-10
REFERENCE READING	FIELD DEVICE READING		
0.000	0.00	0.00	0.0
0.050			
0.150	0.149		
0.200			
0.250	0.240		
0.450	0.450		
0.50		0.50	
1.00		0.98	
1.50			
1.80		1.78	
2.50			2.5
4.50			
5.0			5.0
9.0			9.0
13.0			
22.0			

SIGNATURE: Edward L. Harris

DATE: 12/22/95

MAGEHELIC CALIBRATION

BOX #4

SER. NO.	R22D	R90051 6GT21	R90101 5CD102
RANGE	0-0.50	0-5	0-25
REFERENCE READING	FIELD DEVICE READING		
0.000	0.000	0.00	0.0
0.050			
0.150	0.151		
0.200			
0.250	0.251		
0.450	0.455		
0.50			
1.00			
1.30		1.27	
1.80			
2.50		2.52	
4.50		4.55	
5.0			5.0
9.0			
13.0			13.0
22.0			21.6

SIGNATURE: Edward L Harris

DATE: 12/22/95

TEMPERATURE CALIBRATIONS - DEGREES FAHRENHEIT

REFERENCE DEVICE READING*	0 DEG. F	210 DEG.	420 DEG.	630 DEG.	840 DEG.	1050 DEG.	1260 DEG.	1470 DEG.	1680 DEG.	1900 DEG.
2879	0	217	421	630	839	1050	1260	1471	1681	1900
METER BOX #1 C-133 11580	0	212	423	635	842	1053	1264	1475	1679	1910
METER BOX #2 C-175 15962	0	211	423	627	839	1052	1265	1475	1687	1903
METER BOX #5 S-100 15751	2	211	417	628	844	1062	1279	1491	1698	1907
METER BOX #6 S-101 15751	0	210	419	628	839	1058	1255	1473	1691	1900
PORTABLE THERMOCOUPLE # 2 (Blue)	2	209	415	628	837	1053	1260	1468	1679	1908
PORTABLE THERMOCOUPLE # 2 (Green)	2	211	417	627	842	1058	1273	1484	1688	1896
PINK T140293	-1	208	415	624	840	1056	1272	1482	1687	1894
PORTABLE THERMOCOUPLE (Yellow)	0	210	419	632	840	1050	1259	1470	1680	1901
PORTABLE THERMOCOUPLE T-105998 (Black)	1	209	416	625	839	1055	1270	1481	1684	1891
METER BOX S-102	-2	209	417	625	837	1049	1259	1462	1658	1890
METER BOX S-103	4	215	423	632	844	1057	1266	1471	1667	1895

DATE: 12-05-95 **SIGNATURE:** Edward L. Harris

* Reference Device is an Omega Engineering CL505-A calibrated reference thermocouple-potentiometer system.

SEAS

**SANDERS ENGINEERING &
ANALYTICAL SERVICES, Inc.**

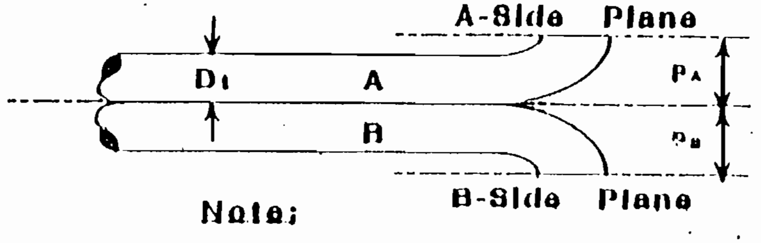
1568 Leroy Stevens Rd.
Mobile, AL 36695

Office: (205) 633-4120
FAX#: (205) 633-2285

The Pitot used was within the following geometric specifications:

Dt between 0.48 and 0.95 cm (3/16 and 3/8 in.)

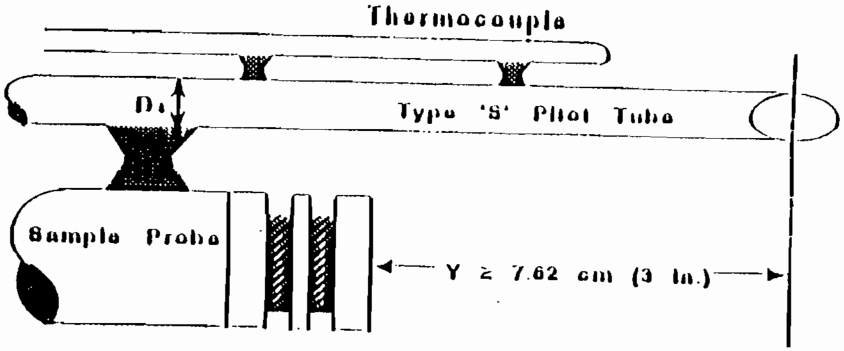
C_p = 0.84



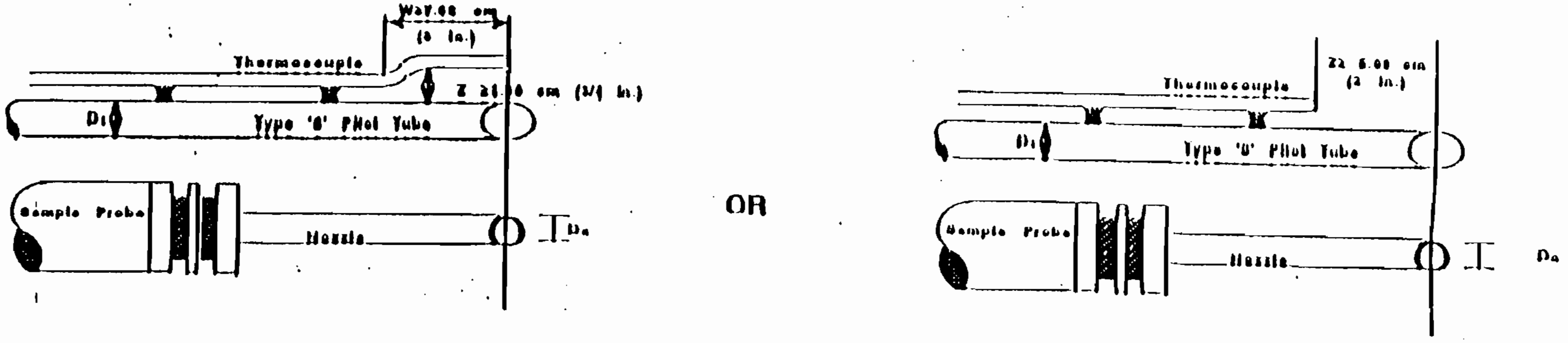
Note:

$1.05\ D_t \le 1.50\ D_t$

$P_A = P_B$



Minimum pitot-sample probe separation needed to prevent interference



Proper thermocouple placement to prevent interference.

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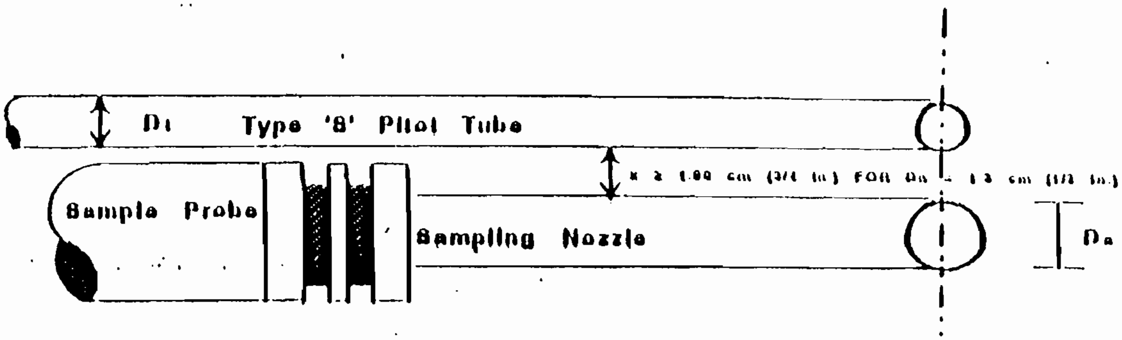
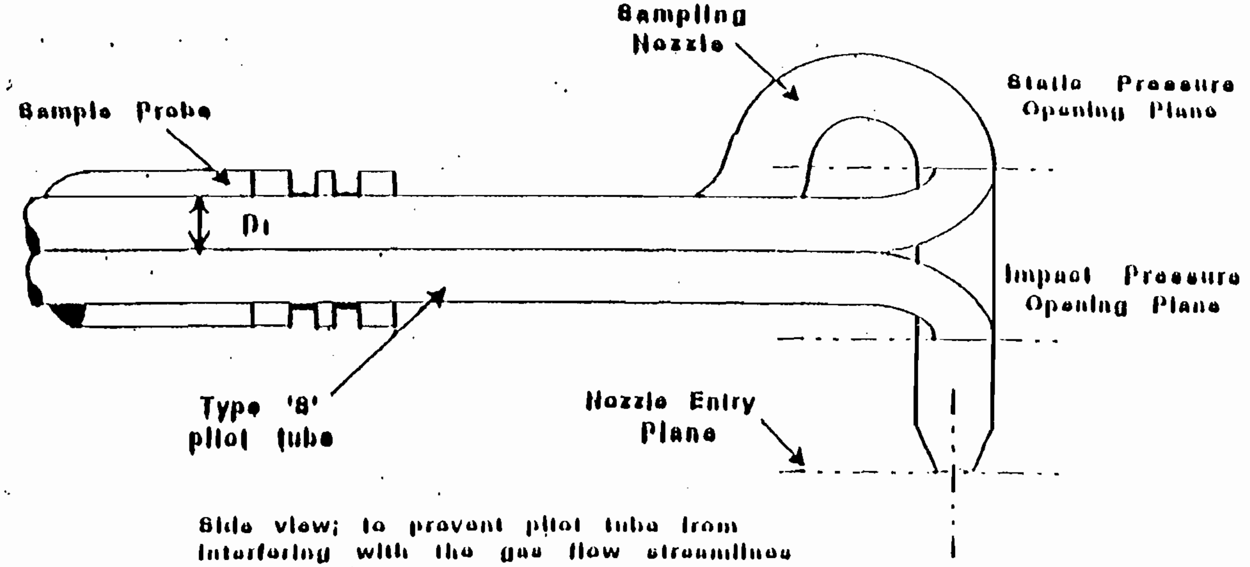
1568 Leroy Stevens Rd.
Mobile, Al. 36695

Office: (205) 633-4120
FAX#: (205) 633-2285

Proper pitot tube-sampling nozzel configuration to prevent aero-dynamic interference; buttonhook type nozzle; centers of nozzle and pitot opening aligned; Dt between 0.48 and 0.95 cm (3/16 and 3/8 in.)



Bottom view showing minimum pitot/nozzle separation



Side view; to prevent pitot tube from interfering with the gas flow streamlines approaching the nozzle, the impact pressure opening plane of the pitot tube shall be even with or above the nozzle entry plane.

**SANDERS ENGINEERING &
ANALYTICAL SERVICES, Inc.**

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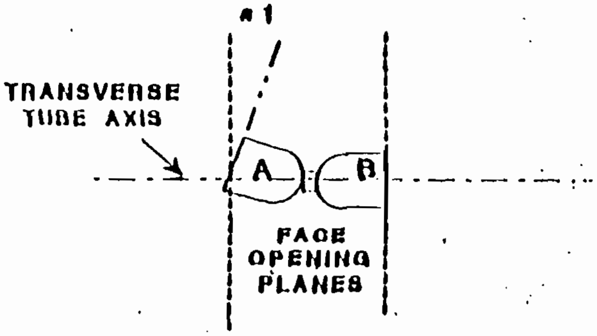
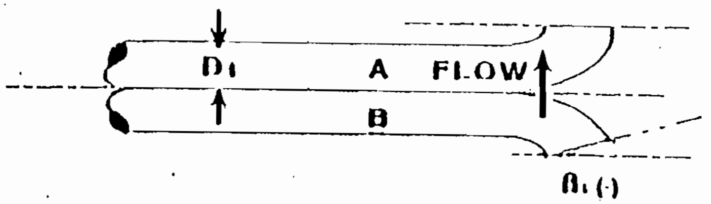
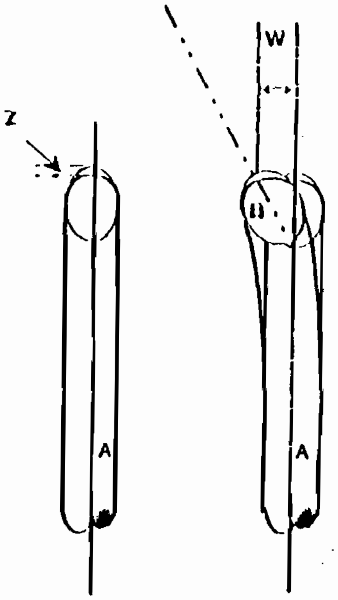
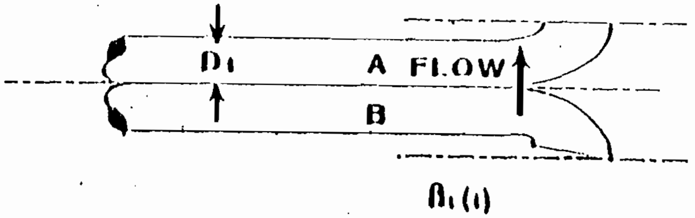
FAX#: (205) 633-2285

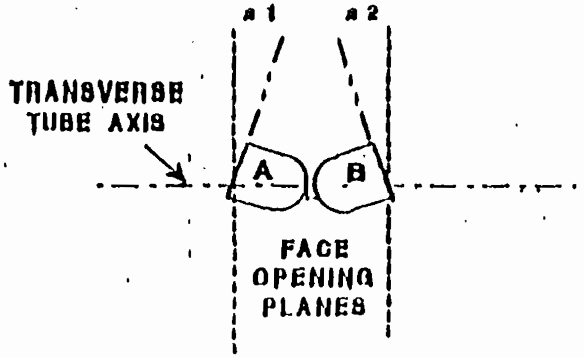
Types of face-opening misalignment that can result from field use or improper construction of type 'S' pitot tubes. These will not affect the baseline value of Cp(s) so long as α_1 and $\alpha_2 < 10°$, β_1 and $\beta_2 < 5°$, ≤ 0.32 cm (1/8 in.)

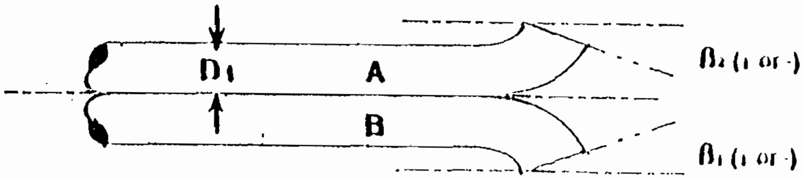












APPENDIX D OPERATIONAL DATA

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST CHRONOLOGY
UNIT # 2
SOOTBLOWING CONDITIONS
May 9, 1996

RUN # 1	START	6:51 a.m.	No problems noted at beginning of run.
	STOP	8:58 a.m.	No problems noted at end of run.
RUN # 2	START	9:06 a.m.	No problems noted at beginning of run.
	STOP	11:15 a.m.	No problems noted at end of run.
RUN # 3	START	12:13 p.m.	No problems noted at beginning of run.
	STOP	1:04 p.m.	Temporary stop do to problem with unit.
	START	1:53 p.m.	Restarted the run.
	STOP	3:10 p.m.	No problems noted at end of run.

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 2
SOOT BLOWING CONDITIONS
May 9, 1996

TIME OF 6 MIN. AVERAGE	OPACITY (%)
(RUN # 1)	(RUN # 1)
6:51 - 6:54	7.1
6:55 - 7:00	5.9
7:01 - 7:06	6.2
7:07 - 7:12	6.5
7:13 - 7:18	5.7
7:19 - 7:24	6.5
7:25 - 7:30	5.6
7:31 - 7:36	5.8
7:37 - 7:42	12.8
7:43 - 7:48	5.8
7:49 - 7:54	6.0
7:55 - 8:00	5.6
8:01 - 8:06	5.9
8:07 - 8:12	6.0
8:13 - 8:18	5.4
8:19 - 8:24	5.8
8:25 - 8:30	5.6
8:31 - 8:36	6.1
8:37 - 8:42	6.0
8:43 - 8:48	5.4
8:49 - 8:54	5.9
8:55 - 8:58	5.5

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 2
SOOT BLOWING CONDITIONS
May 9, 1996

(RUN # 2)	(RUN # 2)
9:06 - 9:12	6.0
9:13 - 9:18	5.3
9:19 - 9:24	5.9
9:25 - 9:30	5.6
9:31 - 9:36	5.8
9:37 - 9:42	5.7
9:43 - 9:48	5.4
9:49 - 9:54	5.8
9:55 - 10:00	5.5
10:01 - 10:06	5.9
10:07 - 10:12	5.8
10:13 - 10:18	5.2
10:19 - 10:24	5.9
10:25 - 10:30	5.3
10:31 - 10:36	5.6
10:37 - 10:42	5.8
10:43 - 10:48	5.7
10:49 - 10:54	5.9
10:55 - 11:00	5.5
11:01 - 11:06	5.8
11:07 - 11:12	5.9
11:13 - 11:15	5.5

SMITH ELECTRIC GENERATING PLANT
PARTICULATE COMPLIANCE TEST
SIX - MINUTE OPACITY AVERAGES
UNIT # 2
SOOT BLOWING CONDITIONS
May 9, 1996

(RUN # 3)	(RUN # 3)
12:13 - 2:18	5.6
12:19 - 12:24	6.4
12:25 - 12:30	5.6
12:31 - 12:36	6.0
12:37 - 12:42	6.2
12:43 - 12:48	5.7
12:49 - 12:54	6.2
12:55 - 1:00	5.7
1:01 - 1:04	6.3
Temporary Stop	
1:53 - 1:54	6.7
1:55 - 2:00	6.2
2:01 - 2:06	6.4
2:07 - 2:12	6.3
2:13 - 2:18	5.5
2:19 - 2:24	6.2
2:25 - 2:30	5.7
2:31 - 2:36	5.8
2:37 - 2:42	6.0
2:43 - 2:48	5.6
2:49 - 2:54	6.4
2:55 - 3:00	5.8
3:01 - 3:06	6.0
3:07 - 3:10	6.2

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # 2

CONDITION: (circle one)

[✓ **Sootblowing**] **Steadystate**

RUN NUMBER: 1

Date: 5/9/96

OPERATIONAL DATA FORM

RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS/HR.)					PERCENT O2			PERCENT OPACITY	I.D. FAN AMPS			
										A	B	EMS		1	2	3	4
1	0651	1,489,000	200	1,360,000	29 K	24K	27K	30K	31 K	4.23	OUT	OUT	6.2	255	265		
1	0858	1,487,000	200	1,360,000	30 K	25K	29 K	31 K	32K	4.08	"	"	5.9	259	261		

COMMENTS:

	START	STOP
A	885725	886488
B	327634	327769
C	820999	821649
D	389163	389899
E	263811	264627

GAS TEMP (F) AIR PREHEATERS				PULVERIZER MILLS TEMPERATURES				
1 A	2 B	3 A	4 B	1	2	3	4	5
144	136	307	312	152	151	150	147	150
139	130	306	309	150	150	150	156	150

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # 2

CONDITION: (circle one)

[✓ Sootblowing] Steadystate

RUN NUMBER: 2

Date: 5/9/96

OPERATIONAL DATA FORM

RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS/HR.)					PERCENT O2			PERCENT OPACITY	I.D. FAN AMPS			
					A	B	C	D	E	A	B	EMS		1	2	3	4
2	0906	1,487,000	200	1,360,000	31.6	30.2	26.6	30.4	34.2	4.08	OUT	OUT	5.9	259	261		
	1115	1,486,000	202	1,360,000	31.7	30.2	26.9	30.4	34.0	4.01	"	"	5.8	258	260		

COMMENTS:

START	STOP
886512	888265
327792	328518
821669	822310
389922	390651
264652	265462

AIR PREHEATERS GAS TEMP (F) AIR IN		GAS OUT		PULVERIZER MILLS TEMPERATURES				
1	2	3	4	1	2	3	4	5
139	130	306	309	149	150	150	156	150
137	128	306	310	149	150	148	155	149

PCT ATTACHMENT "

BEST AVAILABLE COPY

13^{53}
[illegible]
[illegible]

15^{10}
271287
804963
055315

GULF POWER COMPANY

PARTICULATE COMPLIANCE TEST

PLANT Smith

UNIT # 2

CONDITION: (circle one)

[✓ Sootblowing] Steadystate

RUN NUMBER: 3

Date: 5-9-96

OPERATIONAL DATA FORM

RUN #	TIME	MAIN STEAM FLOW INDICATOR	MEGAWATT LOAD	BOILER AIR FLOW	PULVERIZER MILLS COAL FLOW (1000 LBS/HR.)					PERCENT O2			PERCENT OPACITY	I.D. FAN AMPS			
										A	B	EMS		1	2	3	4
3	1213	1,489,000	201	1,350,000	31.2	30.4	26.9	30.4	34.4	4.02	OUT	OUT	6.2	252	268		
Temp stop	1304																
Start	13^{53}																
Stop	15^{10}	1.487.000	202	1.340000	31.3	29.9	26.9	31.0	34.7	4.01	OUT	OUT	6.0	255	263		

COMMENTS:

Start	Temp Stop	Start	Stop
887593	887908	888155	888633
328834	329135	329407	329826
822588	822857	823095	823474
390971	391272	391540	391973
265817	266150	266445	266927

GAS TEMP (F) AIR PREHEATERS (AIR IN: 1, 2; GAS OUT: 3, 4)				PULVERIZER MILLS TEMPERATURES				
1	2	3	4	1	2	3	4	5
138	129	306	308	149	149	147	152	148
138	129	306	309	151	151	150	155	151

PCT ATTACHMENT

SMITH ELECTRIC GENERATING PLANT

Precipitator Readings

Unit 2
Date 5-9-96
Load 200

Run # 1
Start Time 0651
Finish Time 0858

Precipitator Cabinet		Primary AMPS	Primary Volts	Secondary AMPS MA	Secondary Voltage KV
Start	A	63	272	850	44.2
	B	40	238	750	0
	C	107	364	990	50.1
	D	OFF			
	E	84	315	920	44.2
	F	60	292	1050	48.5
	G	95	263	950	25.0
	H	100	288	960	28.2
	J	95	267	910	25.7
	K	16	146	120	27.6
	L	78	238	850	33.8
	M	58	256	500	33.8
Finish					
	A	72	288	700	42.6
	B	800	299	510	0
	C	78	319	920	49
	D	OFF			
	E	82	308	860	43.9
	F	90	330	1050	47.6
	G	97	263	810	24.1
	H	98	288	890	27.2
	J	82	252	850	25.4
	K	18	155	140	27.6
	L	83	243	890	34.1
	M	57	247	490	33.2

SMITH ELECTRIC GENERATING PLANT

Precipitator Readings

Unit 2
Date 5-9-96
Load 200

Run # 2
Start Time 0906
Finish Time

Precipitator Cabinet	Primary AMPS	Primary Volts	Secondary AMPS	Secondary Voltage
Start A	62	274	850	44.2
B	70	285	580	0
C	110	366	560	47.6
D	OFF			
E	80	308	960	44.2
F	109	357	1090	48.0
G	88	256	950	24.2
H	101	297	960	28.2
J	99	257	1000	26.3
K	18	159	150	27.6
L	77	238	850	33.8
M	57	252	490	32.9
Finish				
A	83	303	710	42.9
B	48	272	640	0
C	104	357	990	50.1
D	OFF			
E	41	231	950	44.2
F	95	339	350	40.4
G	97	265	850	24.4
H	98	290	950	27.2
J	88	254	810	25
K	18	157	140	27.6
L	81	243	890	33.1
M	57	249	490	33.2

SMITH ELECTRIC GENERATING PLANT

Precipitator Readings

Unit 2
Date 5-9-96
Load 200

Run # 3
Start Time 1213
Finish Time 1510

Precipitator Cabinet	Primary AMPS	Primary Volts	Secondary AMPS	Secondary Voltage
Start A	88	306	720	42.6
B	80	301	650	0
C	108	369	820	48.9
D	OFF			
E	79	303	820	43.6
F	52	279	510	44.2
G	95	265	820	24.1
H	96	288	890	27.6
J	96	267	790	25.1
K	15	144	110	27.2
L	81	240	880	33.2
M	57	249	490	33.5
Finish A	80	303	880	44.1
B	58	276	430	0
C	90	342	580	47.3
D	OFF			
E	75	277	820	43.6
F	108	353	1030	47.6
G	87	252	850	24.4
H	100	292	920	27.2
J	87	257	910	26.0
K	15	146	110	26.9
L	88	252	780	33.2
M	57	252	490	32.9

Cold Precips

Inlet

	IP	VP	IS	VS
start	44	447	650	45.8
stop	44	447	670	45.8

Intermediate

	IP	VP	IS	VS
start	80	450	610	58.9
	80	450	610	58.6

outlet

	IP	VP	IS	VS
start	91	461	720	71.5
	91	461	720	71.5

Inlet

	IP	VP	IS	VS
start	44	447	670	45.8
stop	44	447	670	45.8

Intermediate

IP	VP	IS	VS
76	447	580	57.7
80	450	610	58.3

outlet

	IP	VP	IS	VS
Start	90	453	710	69.1
	80	438	580	66.5

Cold Precips

Inlet

	IP	VP	IS	VS
start	44	447	670	45.8
stop	44	447	670	45.8

Intermediate

	IP	VP	IS	VS
start	77	447	590	57.4
	78	450	590	58.0

outlet

	IP	VP	IS	VS
start	66	409	580	66.1
	90—	450	700	70.2

GULF POWER COMPANY

Visible Emission Observation Form

SOURCE NAME
PLANT SMITH COMBUSTION TURBINE (SOUTH STACK)

ADDRESS
4300 CO. Rd. 2300

SOUTHPORT FL. 32409

CITY SOUTHPORT
STATE FL
ZIP 32409

PHONE 265-2185
SOURCE ID NUMBER

PROCESS EQUIPMENT COMBUSTION TURBINE
OPERATING MODE 41 MW TOTAL

CONTROL EQUIPMENT NONE
OPERATING MODE NA

DESCRIBE EMISSION POINT SOUTHERN MOST,
START SQUARE STACK STOP SQUARE STACK

HEIGHT ABOVE GROUND LEVEL START 35 ft STOP 35 FT
HEIGHT RELATIVE TO OBSERVER START 45 ft STOP 45 ft

DISTANCE FROM OBSERVER START 30 yds STOP 30 yds
DIRECTION FROM OBSERVER START NW STOP NW

DESCRIBE EMISSIONS
START STEADY STOP STEADY

EMISSION COLOR START DARK STOP DARK
PLUME TYPE CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐

WATER DROPLETS PRESENT NO ☒ YES ☐
IF WATER DROPLET PLUME ATTACHED ☐ DETACHED ☐

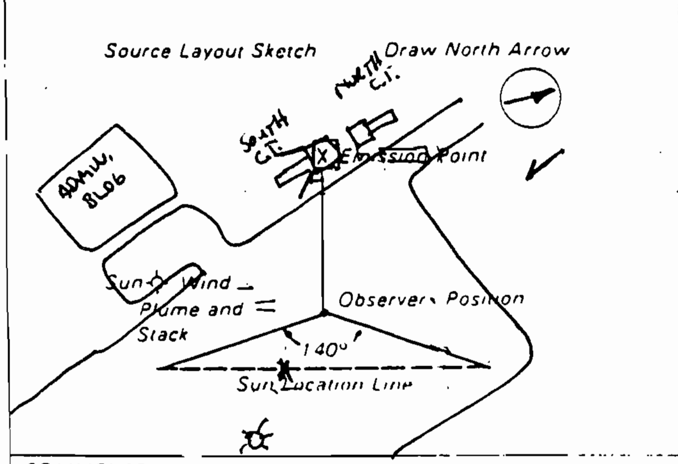
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED
START AT STACK EXIT STOP AT STACK EXIT

DESCRIBE BACKGROUND
START CLEAR SKY (BLUE) STOP CLEAR SKY (BLUE)

BACKGROUND COLOR START BLUE STOP BLUE
SKY CONDITIONS START CLEAR STOP CLEAR

WIND SPEED START 10-15 mph STOP 10-15 mph
WIND DIRECTION START N STOP N

AMBIENT TEMP START 35-38° STOP 35-38°
WET BULB TEMP 30° F
RH.percent 55%



COMMENTS

I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS
SIGNATURE

TITLE
DATE

OBSERVATION DATE 3/9/96
START TIME 08:45
STOP TIME 09:44

SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
1	10	16	10	10	31	10	10	10	10
2	10	10	10	15	32	10	10	10	10
3	15	15	10	10	33	10	15	15	10
4	10	10	10	10	34	15	15	15	10
5	10	10	10	10	35	15	15	15	15
6	10	10	10	10	36	15	10	15	15
7	15	15	15	10	37	15	15	10	10
8	15	15	15	15	38	10	10	10	10
9	15	15	15	15	39	10	10	10	10
10	15	15	15	15	40	10	10	10	10
11	15	15	10	10	41	10	10	10	10
12	10	10	10	10	42	10	10	10	10
13	10	10	10	10	43	10	10	10	10
14	15	10	10	10	44	10	10	10	10
15	15	15	15	15	45	10	10	10	15
16	10	10	10	10	46	15	15	15	15
17	10	15	15	15	47	15	10	10	10
18	15	15	15	10	48	15	15	10	10
19	10	10	10	10	49	15	15	15	15
20	10	10	10	15	50	15	15	15	15
21	15	15	15	15	51	15	15	10	15
22	10	10	15	15	52	15	15	15	15
23	15	15	15	15	53	10	10	10	10
24	15	15	15	15	54	10	10	10	10
25	10	10	10	10	55	15	20	15	15
26	10	10	10	10	56	15	20	15	15
27	10	15	10	10	57	15	15	15	15
28	10	15	10	10	58	15	15	15	15
29	10	10	10	15	59	10	15	15	15
30	15	15	10	10	60	10	15	15	15

AVERAGE OPACITY FOR HIGHEST PERIOD NA
NUMBER OF READINGS ABOVE 20 % WERE 0

RANGE OF OPACITY READINGS
MINIMUM 10% MAXIMUM 20%

OBSERVER'S NAME (PRINT) STAN HOUSTON

OBSERVER'S SIGNATURE Sta Houst
DATE 3/13/96

ORGANIZATION GULF POWER COMPANY

CERTIFIED BY D.E.P.
DATE NOV. 15 1995

VERIFIED BY
DATE

Plant Smith Startup Procedures

The steam generators for Units 1 and 2 at Plant Smith are tangentially fired, balanced draft boilers, manufactured by Combustion Engineering. The primary fuel is coal. The auxiliary fuel is #2 fuel oil used for startup and flame stabilization. The startup procedure is basically the same for both Units 1 and 2 and is as follows:

> Prior to startup, insure that all personnel and foreign materials are out of the boiler and ductwork before the access and observation doors are closed and secured, including the induced draft (ID) fan and the forced draft (FD) fan and the pulverizers. Strictly follow the hold tag procedures to maintain the highest level of safety. During startups, firing is done by means of the pilots and warm-up oil guns. To insure a maximum safety margin, it is recommended that the air flow in the boiler be at least 30% of full load air flow until the boiler is online. When bringing the unit up to proper pressure and temperature, the saturated steam temperature rise should not exceed 100 degrees per hour for Unit 1 and 200 degrees per hour for Unit 2. Verify the boiler valves are in the startup position. Start the air heaters. Place the cold precipitators in service prior to starting the fans. Start the ID fan then start the FD fan. Adjust the air flow to approximately 30 % of full load air flow which is between 300,000 and 400,000 lbs. per hour. open the fuel oil valves and light off all pilots one band at a time. Unit 1 has four bands o foil guns, and Unit has five bands of oil guns. Allow sufficient time for the furnace area to heat up to burn the larger amount of oil that will be needed as the boiler is fired. Maintain a careful watch on the fires, and add oil guns as needed to maintain the firing rate. After approximately six hours, the steam pressure and temperature will be sufficient enough in the boiler to roll and warm the turbine. This process takes approximately six to twelve hours from the time when a fire is established in the boiler but is dictated directly by ambient temperature, fuel quality, the number of equipment malfunctions encountered during startup, and the turbine warm-up conditions. About thirty minutes before the turbine reaches 3600 rpm, start two coal pulverizers and warm them to operating temperature. After the unit is online, which is referring to the transmission of electrical power to the switchyard for power distribution, one coal pulverizer is placed in service to maintain the steam flow requirements. The hot precipitators are now placed in service. As the oil is decreased to zero, the second pulverizer is placed in service; and as conditions allow, the unit is increased to minimum load. Startup operations are completed when the plant laboratoryman checks the quality of the boiler water and its ancillary equipment and processes and releases the unit for full boiler pressure and electrical generation. Air heater sootblowers are usually blown during the startup period to maintain the cleanliness of the air heaters.

Plant Smith Shutdown Procedures

Shutdown operations can be separated into two categories: emergency shutdown or normal shutdown. An emergency shutdown occurs when a piece of equipment fails or an electrical fault occurs within the system and causes the unit to trip off-line. A this point, all of the fuel is immediately taken out of the boiler. The unit is stabilized; and depending on what was at fault, the unit is either left down or the malfunction is corrected, and the unit is brought back on line. A normal controlled shutdown is usually brought about due to load demands within the Southern System and how the units are dispatched. When a unit is requested to shutdown by Central Dispatch, the fuel is slowly restricted to the boiler while the steam pressure is allowed to drop. When all of the fuel has been removed from the boiler, the ID and FD fans are left running to cool the boiler. When the temperature drops to approximately 100 to 125 degrees, the fans are shut down and the precipitator is taken out of service.

An emergency shutdown typically takes from a half hour to several hours, depending on the nature of the emergency and whether the unit is placed back "online" after correcting the equipment malfunction. Atypical normal shutdown takes approximately ten to twelve hours to cool down the boiler and shut down the fans and precipitator. This time period depends on the ambient temperature and the number of equipment malfunctions encountered during shutdown.

Smith Plant Combustion Turbine
Start-up Procedures

The Plant Smith Combustion Turbine (CT) is a simple cycle combustion turbine which utilizes a Pratt and Whitney aircraft engine to produce approximately 40 MW. The primary fuel for the Plant Smith CT is Distillate #2 fuel oil.

The aircraft combustion turbine does not currently employ any hardware for monitoring or control of emissions due to the fact that it is a "peaking" unit. Therefore, the only method for determining excess emissions at present is visual (EPA Method 9 visible emissions tests).
If excess emissions (opacity) are exhibited during startup of the combustion turbine, corrective actions may include changing from automatic to manual operational control or shutting down the unit to investigate the cause of the opacity problem.

The following is a general startup procedure for operation of the Plant Smith Combustion Turbine:

1. Check the plenum chamber to ascertain that the air-inlet area to the gas generator compressor is clean, and empty of tools, rags, clothing, and people. Check to ascertain that all plenum chamber entrance doors and hatches are closed and locked. Hold tag procedures are strictly followed to insure the highest level of safety.
2. Electric power to the Gas Generator control panel is on.
3. The Gas Generator Output Control-is placed in the off position. -The Fuel shutoff valve is placed in the off position.
4. The Fuel Booster Pump is placed in the on position
5. The Fuel Inlet Pressure Indicator should indicate a minimum of 5 psi
6. The Starter Switch is placed in the on position
7. Allow the compressor(s) to rotate for 15 seconds for a liquid-fuel generator or 60 seconds for a gaseous-fuel gas generator to completely purge all combustible material from the gas generator, free turbine and the exhaust ducting. With pneumatic starters on liquid-fuel installations, the rpm for the purging will be the normal gas generator starter speed.

When purging is completed, perform the following steps in close sequence:

8. Turn the Gas Generator Ignition to the on position
9. Turn the Station fuel gas shutoff valve to the open position
10. Place the Gas generator output control to minimum and turn the fuel shutoff valve to the open position
11. A gas generator "light-up " should be noted within a specified time limit after the fuel shutoff valve is opened. A light-up will be evidenced by a rise in the gas generator turbine discharge temperature. The temperature should peak at some value below the maximum allowable temperature for starting, approximately X degrees F,

then level off at the normal turbine discharge temperature value for idle. The gas generator will automatically accelerate to idle rpm.

12. When the idle rpm is reached, the Starter Switch or Valve is turned to the off position and the gas generator ignition is switched off.

13. After a sucessful ignition of the system,the gas turbine engine instruments are closely monitored to determine that the gas generator is operating properly. Startup is complete when the operator determines that all systema are operating ans the load is increased to 40 MW.

14. The typical Plant Smith CT takes approximately 10 minutes from the time the CT is energized, but can be directly dicated by ambient air temperature, fuel quality, and the number of equipment malfunctions encountered during startup.

Combustion Turbine Shutdown

1. Set the Free Turbine RPM Set Point Control to Minimum
2. Turn the Gas Generator Output Control to Off or Minimum and turn the Fuel Shutoff Valve to the off position
3 Turn Electric Power to the Gas Generator Control Panel to the off position

EUS-10

Smith1EUS1-10 (Alternative Methods of Operation)

ALTERNATIVE METHODS OF OPERATION
LANSING SMITH UNIT 1

1. **Unit is operated under normal conditions utilizing coal as the primary fuel with supplemental firing of "on specification" used oil at a rate to minimize emissions less than the applicable opacity standard. The amount of used oil to be consumed by the unit is estimated to be less than 50,000 gallons per year.**

2. **Unit is operated under normal conditions utilizing coal as the primary fuel with supplemental firing of "boiler chemical cleaning waste" at a rate of less than 50 gallons per minute to minimize emissions less than the applicable opacity standard.**

3. **Unit is operated under normal conditions utilizing coal as the primary fuel with supplemental firing of "oil contaminated soil" for energy recovery at a rate to minimize emissions less than the applicable opacity standard. The amount of "oil contaminated soil" is estimated to be less than 2500 cubic yards of soil per year.**

4. **Unit is operated under normal conditions utilizing coal as the primary fuel with supplemental firing of #2 oil.**

5. **Unit is operated under normal conditions utilizing subituminous coal as the primary fuel.**

6. **Unit is operated under normal conditions utilizing bituminous coal as the primary fuel.**

ALTERNATIVE METHODS OF OPERATION
LANSING SMITH UNIT 2

1. **Unit is operated under normal conditions utilizing coal as the primary fuel with supplemental firing of "on specification" used oil at a rate to minimize emissions less than the applicable opacity standard. The amount of used oil to be consumed by the unit is estimated to be less than 50,000 gallons per year.**

2. **Unit is operated under normal conditions utilizing coal as the primary fuel with supplemental firing of "boiler chemical cleaning waste" at a rate of less than 50 gallons per minute to minimize emissions less than the applicable opacity standard.**

3. **Unit is operated under normal conditions utilizing coal as the primary fuel with supplemental firing of "oil contaminated soil" for energy recovery at a rate to minimize emissions less than the applicable opacity standard. The amount of "oil contaminated soil" is estimated to be less than 2500 cubic yards of soil per year.**

4. **Unit is operated under normal conditions utilizing coal as the primary fuel with supplemental firing of #2 oil.**

5. **Unit is operated under normal conditions utilizing subituminous coal as the primary fuel.**

6. **Unit is operated under normal conditions utilizing bituminous coal as the primary fuel.**

Evs-14

received
4/21/92

Florida Department of Environmental Regulation
Northwest District • 160 Governmental Center • Pensacola, Florida 32501-5794
Lawton Chiles, Governor
Carol M. Browner, Secretary

PERMITTEE:	I.D. Number: 10PCY03001401 and 02
	Permit/Certification Number: AO03-211310
Gulf Power Company	Date of Issue: April 17, 1992
	Expiration Date: April 1, 1997
	County: Bay
	Latitude/Longitude: 30°16'08"N/85°42'02"W
	Section/Township/Range: 36/2S/15W
	Project: Smith Units No. 1 and No. 2 Coal Fired Boilers

This permit is issued under the provisions of Section 403.087, Florida Statutes, and Florida Administrative Code Rules 17-2 and 17-4. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

Operation of Smith Units No. 1 and No. 2, both coal fired boilers, generating 175 and 205 megawatts of electricity for Units No. 1 and No. 2 respectively. Particulate emissions from each Unit are controlled by hot side electrostatic precipitators manufactured by Buell Model BAL 2X34N333-4-3P followed by cold side electrostatic precipitators manufactured by American Standard Series 371, Design 24-9P. Sulfur dioxide emissions are controlled by the sulfur content of the coal used as fuel. Sulfur dioxide, nitrogen dioxide, oxygen and opacity are monitored by continuous emission monitors on each Unit.

Located at the end of County Road 391, north shore of North Bay, 2.5 miles northwest of Lynn Haven.

Specific Condition No. 7 requires logging excess emissions.
Specific Condition No. 8 requires keeping a maintenance log.
Specific Condition No. 9 requires submitting quarterly excess emissions reports.
Specific Condition No. 11 requires annual particulate emissions tests due before the end of September.
Specific Condition No. 12 requires maintenance of a QC program.
Specific Condition No. 14 requires reporting of excess emissions as soon as possible.
Specific Condition No. 15 requires actions taken upon particulate test failures.
Specific Condition No. 18 requires submittal of permit renewal application by February 1, 1997.

PERMITTEE:

Gulf Power Company

I.D. Number: 10PCY03001401 and 02
Permit/Certification Number: A003-211310
Date of Issue: April 17, 1992

Expiration Date: April 1, 1997

SPECIFIC CONDITIONS:

1. The attached General Conditions are part of this permit.

2. The maximum allowable heat inputs are those heat inputs necessary to maintain electrical load output at 110% of the level at which the most recent successful particulate emissions compliance test was conducted for each unit. If the test was conducted at less than 90% of rated capacity of the unit, permittee may operate the unit at loads up to the rated capacity (175 and 205 megawatts for Units No. 1 and No. 2 respectively) for purposes of preparation for testing for up to ten calendar days. The Department shall be advised in writing prior to each testing.

3. Particulate emissions shall not exceed 0.1 pounds per million Btu heat input.

4. Sulfur dioxide emissions shall not exceed 6.17 pounds per million Btu heat input.

5. Visible emissions shall not exceed 40% opacity.

6. Excess emissions are defined as:

   A. Any six-minute average for opacity which exceeds the standard.
   B. Any 24-hour average for sulfur dioxide which exceeds the standard.

7. A log shall be maintained showing the:

   A. Duration of excess visible emissions and their causes.
   B. Duration of excess SO_2 emissions.

8. A maintenance log of the continuous monitoring system shall be kept showing:

   A. Time out of service.
   B. Calibrations and adjustments.

9. A quarterly report of excess emissions shall be submitted within 30 days following the end of each calendar quarter. The report shall consist of each individual exceedance of opacity or SO_2 emissions (Specific Conditions 6 and 7) with duration, magnitude and cause. Any exceedance that is beyond the allowances of FAC Rule 17-2.250 shall be highlighted with note indicating compliance with Specific Condition 14 below.

10. Units 1 and 2 use a common stack. Visible emission violations from this stack shall be attributed to both Units unless opacity meter results show the specific Unit causing the violation.

SPECIFIC CONDITIONS:

11. Particulate emissions tests are required to show continuing compliance with the standards of the Department. The test results must provide reasonable assurance that the source is capable of compliance at the permitted maximum operating rate. Tests shall be conducted in accordance with EPA methods 1, 2, 3 and 17. Such tests shall be conducted once per year before the end of September. Results shall be submitted to the Department within 45 days after testing. The Department shall be notified at least 15 days prior to testing to allow witnessing.

12. Continuous SO_2 emission monitoring 24-hour averages are required to demonstrate compliance with the standard of the Department (Specific Condition 4). A valid 24-hour average shall consist of no less than 18 hours of valid data capture per calendar day. In the event that valid data capture is not available, the permittee shall initiate as-fired fuel sampling to demonstrate compliance with the SO_2 emission standard. The as-fired fuel sampling shall be initiated no later than 36 hours after the permittee has verified the problem or no later than 36 hours after the end of the affected calendar day. Fuel sampling shall continue until such time as the valid data capture is restored. In lieu of as-fired fuel sampling the permittee may elect to demonstrate SO_2 emission compliance by the temporary use of a spare SO_2 emission monitor. The spare SO_2 emissions monitor must be installed and collecting data in the same time frame as required above for as-fired fuel sampling.

Maintain a QC program. As a minimum the QC program must include written procedures which should describe in detail complete, step-by-step procedures and operations for each of the following activities:

1. Calibration of CEMS.
2. CD determination and adjustment of CEMS.
3. Preventative maintenance of CEMS (including spare parts inventory).
4. Data recording, calculations and reporting.
5. Accuracy audit procedures including sampling and analysis methods.
6. Program of corrective action for malfunctioning CEMS.

13. Excess emissions as stated in Florida Administrative Code Rule 17-2.250 shall be allowed.

14. The Department shall be notified as soon as possible (by telephone) of excess emissions that are beyond the allowances of FAC Rule 17-2.250, such as:

A. Any soot blowing or load changes that cause excess visible emissions for a period longer than three hours, or that exceed 60% opacity (six minute average) more than four times in any one day.

B. Any malfunction that causes visible emissions for a period longer than two hour in any one day.

C. A 24-hour average of SO_2 emissions measured by the continuous monitor that exceeds the standard, or daily average SO_2 emissions measured by coal analysis (in the event the permittee chooses) that exceeds the standard.

Immediately upon notification of excess emissions that are beyond the allowances, the permittee shall take the necessary steps to determine the cause and arrange a meeting with the Department within 72 hours to discuss a settlement of the violation with corrective action to avoid recurrence.

PERMITTEE:

Gulf Power Company

I.D. Number: 10PCY03001401 and 02
Permit/Certification Number: AO03-211310
Date of Issue: April 17, 1992

Expiration Date: April 1, 1997

SPECIFIC CONDITIONS:

15. Immediately upon notification of a particulate test report that fails to demonstrate compliance with the particulate emission limit of 0.1 pounds per million Btu heat input, the permittee shall take necessary steps to determine the cause of the test failure and arrange a meeting with the Department within 72 hours to discuss a settlement of the violation and a schedule for retesting when the cause of the test failure has been determined and corrected.

16. An annual operation report (DER Form 17-1.202(6) attached) shall be submitted by March 1 each year. The attached form shall be reproduced by the permittee and used for future annual submittals.

17. An application to renew this permit shall be submitted prior to February 1, 1997.

18. The permanent source identification numbers for these point sources are:
10PCY03001401 Smith Unit No. 1, and
10PCY03001402 Smith Unit No. 2.
Please cite the appropriate number on all test reports and other correspondence specific to a permitted point source.

19. The Department telephone number for reporting problems, malfunctions or exceedances under this permit is (904) 436-8300, day or night, and for emergencies involving a significant threat to human health or the environment is (904) 488-1320. For routine business, telephone (904) 872-4375 during normal working hours.

Expiration date:

April 1, 1997

Issued this 17th day of April,
1992.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

ROBERT V. KRIEGEL
District Director

PERMITTEE:

Gulf Power Company

I.D. Number: 10PCY03001401 and 02
Permit/Certification Number: AO03-211310
Date of Issue: April 17, 1992

Expiration Date: April 1, 1997

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "permit conditions", and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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

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

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

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

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

PERMITTEE:

Gulf Power Company

I.D. Number: 10PCY03001401 and 02
Permit/Certification Number: AO03-211310
Date of Issue: April 17, 1992

Expiration Date: April 1, 1997

GENERAL CONDITIONS:

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

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

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

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

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

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

a. A description of and cause of noncompliance; and

b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with Florida Rules of Civil Procedure and appropriate evidentiary rules.

GENERAL CONDITIONS:

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-730.300, as applicable. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department.

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

13. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

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

c. Records of monitoring information shall include:

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

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

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF PERMIT ISSUANCE

<u>CERTIFIED MAIL</u>

In the matter of an
Application for Permit
By:
M. L. Gilchrist
Manager of Fuel and Environmental Affairs
Gulf Power Company
Post Office Box 1151
Pensacola, Florida 32520-0328
______________________________/

DEP File No. AO03-249657
Bay County

Enclosed is Permit Number AO03-249657 to Gulf Power Company, issued pursuant to Section 403.087, Florida Statutes.

A person whose substantial interests are affected by this permit may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee 32399-2400, within 14 days of receipt of this Permit. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this permit. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 21 days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes, and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This permit is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this permit will not be effective until further Order of the Department.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Final Order is filed with the Clerk of the Department.

Executed in Pensacola, Florida.

State of Florida Department
of Environmental Protection

BOBBY A. COOLEY
District Director

160 Governmental Center
Pensacola, Florida 32501-5794
(904) 444-8300

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF PERMIT ISSUANCE and all copies were mailed by certified mail before the close of business on MAY 20, 1994 to the listed persons.

FILING AND ACKNOWLEDGMENT FILED,
on this date, pursuant to §120.52(9),
Florida Statutes, with the designated
Department clerk, receipt of which is
hereby acknowledged.

5/20/94

Clerk Date

Copies furnished to:
DEP Panama City Branch Office

Florida Department of
Environmental Protection

Lawton Chiles
Governor

Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Virginia B. Wetherell
Secretary

PERMITTEE:

Gulf Power Company

I.D. Number: 10PCY03001403
Permit/Certification Number: AO03-249657
Date of Issue: May 19, 1994
Expiration Date: January 15, 1996
County: Bay
Latitude/Longitude: 30°15'58"N/85°41'56"W
Project: Two combustion turbines/peaking unit

This permit is issued under the provisions of Section 403.087, Florida Statutes, and Florida Administrative Code Rules 17-296, 17-297 and 17-4. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

Operation of two combustion turbines (A and B) fueled by No. 2 fuel oil (distillate) with a maximum of 0.5% sulfur and a maximum heat input of 542 MMBtu/hour used to drive a single peaking generator.

Operation of this source shall be consistent with the operation permit application dated April 15, 1994.

Located at West Bay in Lynn Haven, Bay County.

Specific Condition No. 2 establishes a maximum allowable operating and testing rate.

Specific Condition No. 4 limits the fuel oil to No. 2 oil with a maximum of 0.5% sulfur by weight.

Specific Condition No. 5 establishes emission limits.

Specific Condition No. 6 establishes compliance testing requirements.

Specific Condition No. 7 requires annual operation reports.

Specific Condition No. 8 requires submission of a Major Air Pollution Source Annual Operation Fee form.

Specific Condition No. 9 requires submission of a Title V permit application.

PERMITTEE:

Gulf Power Company

I.D. Number: 10PCY03001403
Permit/Certification Number: AO03-249657
Date of Issue: May 19, 1994
Expiration Date: January 15, 1996

SPECIFIC CONDITIONS:

General

1. The attached General Conditions are part of this permit (FAC Rule 17-4.160).

Operation

2. The maximum allowable operating rate is 542 MMBtu per hour. This is the operating rate at which compliance with standards shall be demonstrated. Testing of emissions shall be conducted at 95 to 100% of the manufacturer's rated heat input based on the average ambient air temperature during the test. Compliance shall be determined using the turbine manufacturer's throughput rating for the average ambient temperature by multiplying the permitted emission limit at ISO conditions (59°F and 60% humidity) by the ratio of the tested heat input to the maximum heat input (MMBtu/hr) at ISO conditions. Manufacturer's rating data for correcting heat input and emissions to other temperatures must be submitted to the Department at least 30 days before the first compliance test. Manufacturer's data shall be continually validated by scheduling subsequent annual tests for successive quarters of the year. If it is impracticable to test at capacity, then sources may be tested at less than capacity; if the source is tested at less than capacity, subsequent source operation is limited to 110% of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacity is allowed for no more than fifteen days for purposes of additional compliance testing to regain the rated capacity in the permit with prior notification to the Department. (FAC Rule 17-4.070)

3. The maximum hours of operation are 24 hours/day, 7 days/week, and 52 weeks/year. The Permittee shall maintain an operation log available for Department inspection certifying the total hours of operation annually. (Application dated 04/15/94)

4. The maximum sulfur content of the No. 2 fuel oil is limited to 0.5% sulfur by weight. The Permittee shall maintain a log available for Department inspection of the fuel oil sulfur content. (Application dated 04/15/94)

Emissions

6. The maximum allowable emission limit for each pollutant is as follows:

Pollutant	FAC Rule	Allowable Emissions
VE	17-296.310	20% opacity

PERMITTEE:

Gulf Power Company

I.D. Number: 10PCY03001403
Permit/Certification Number: AO03-249657
Date of Issue: May 19, 1994
Expiration Date: January 15, 1996

SPECIFIC CONDITIONS:

Testing

6. Emissions tests for visible emissions shall be performed between October 1 and November 30, 1998 in accordance with the test methods and frequency indicated, with notification to the Department 15 days prior to testing. The test results must provide reasonable assurance that the source is capable of compliance at the permitted maximum operating rate. For good cause, the Permittee may request an extension of a compliance test due date. However, inadequate planning of testing does not constitute good cause for an extension of the compliance test due date. The test report documentation must be submitted to the Department within 45 days after completion of testing.

Pollutant	Frequency	Test Method	Reference
VE	once/permit	DEP method 9	FAC Rule 17-297

The VE test shall be for a duration of 60 minutes. Test reports shall comply with F.A.C. Rule 17-297.570, Test Reports. The Department can require special compliance tests in accordance with F.A.C. Rule 17-297.340(2).

Administrative

7. An annual operation report [DEP Form 17-210.900(4) attached] shall be submitted by March 1 each year. The attached form shall be reproduced by the Permittee and used for future annual submittals (FAC Rule 17-210.370) .

8. In accordance with F.A.C. Rule 17-213, a Major Air Pollution Source Annual Operation Fee Form [DEP Form 17-213.900(11) attached] must be completed and submitted with appropriate fee between January 15 and March 1 of each year. If the Department has not received the fee payment by March 1, the Department shall impose, in addition to the fee, a penalty of 50 percent of the amount of the fee, plus interest on such amount computed in accordance with s.220.807, Florida Statutes. The Department may revoke any major air pollution source operation permit if it finds that the permit holder has failed to pay timely and required annual operation license fee, penalty or interest. The attached form shall be reproduced by the Permittee and used for future annual submittals. The completed form and appropriate fees must be submitted to the Department of Environmental Protection, Title V (Facility I.D. Number), 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

9. An application to renew this permit shall be submitted as required for a Title V permit (FAC Rule 17-210).

PERMITTEE:

Gulf Power Company

I.D. Number: 10PCY03001403
Permit/Certification Number: AO03-249657
Date of Issue: May 19, 1994
Expiration Date: January 15, 1996

SPECIFIC CONDITIONS:

10. The permanent source identification number for this point source is 10PCY03001403. Please cite this number on all test reports and other correspondence specific to this permitted point source. (FAC Rule 17-297.570)

11. The Department telephone number for reporting problems, malfunctions or exceedances under this permit is (904) 444-8300, day or night, and for emergencies involving a significant threat to human health or the environment is (904) 488-1320. For routine business, use telephone number (904) 872-4375 during normal working hours. (FAC Rule 17-210.700)

Expiration Date:

January 15, 1996

Issued this 19th day of May, 1994.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Bobby A Cooley

BOBBY A. COOLEY
District Director

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "permit conditions", and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, Florida Statutes. The Permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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

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

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

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

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

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

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

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

GENERAL CONDITIONS:

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

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

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

a. A description of and cause of noncompliance; and

b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. The Permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the Permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with Florida Rules of Civil Procedure and appropriate evidentiary rules.

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

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-730.300, as applicable. The Permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department.

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

13. The Permittee shall comply with the following:

a. Upon request, the Permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

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

c. Records of monitoring information shall include:

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

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

Gulf Power Company
500 Bayfront Parkway
Post Office Box 1151
Pensacola, FL 32520
Telephone 904 444-6111

Gulf Power
the southern electric system

March 13, 1995

Mr. Ed K. Middleswart
Florida Department of Environmental Protection
Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Dear Mr. Middleswart:

RE: PLANT SMITH ENERGY RECOVERY OF OIL CONTAMINATED SOILS

Pursuant to our previous conversations and correspondences regarding the energy recovery of oil contaminated soils at Gulf Power facilities, Gulf Power is preparing to burn for energy recovery and disposal purposes approximately 2500 cubic yards of contaminated soil from a cleanup of the area near the Lansing Smith Combustion Turbine. Treatment of soils in this manner is allowed by Rule 62-775, F.A.C. A Remedial Action Plan (RAP) for this project was submitted to the Waste Management Program of the FDEP Northwest District on February 28 1995. The FDEP Waste Management Facility I.D. number for the project is 038733308 and the Departmental coordinator for the project is Mr. Mike Kennedy, P. G.

Gulf Power conducted testing of the soil for TCLP metals and the results indicates the soil to be non-hazardous. No TCLP analysis of volatile organics was required due to no organics being found in the EPA Method 8010/8020 analyses.

In addition to burning the contaminated soil for energy recovery, the project will use a vapor extraction method to purge soil in the area of contamination. The proposed method will use steam to volatilize the hydrocarbons in inaccessible areas. The soil vapor extraction system will operate with steam for approximately two months and is expected to remove up to 90% of the hydrocarbon contaminates. The system will then operate until the end of the project (approximately 3 years) using ambient air to remove the remaining trace contaminates.

Several weeks ago I discussed this project with Mr. Rick Prusa of your staff and Mr. Prusa and Ms. Carol Melton were instrumental in sending me a list of air toxics for a preliminary impact determination. An evaluation (TSCREEN and other analytical results) of our proposed method of treatment revealed no ambient air impacts or air toxic concerns.

Attached for your information is a copy of the above referenced analyses and copies of previous correspondences regarding burning soil for energy recovery. Pursuant to the review of all available information, Gulf Power has determined that no revisions are needed to the Lansing Smith air operating permit for the completion of this project. Information regarding the project will be included in the up-coming Title V permit application.

If you have any questions, or if you need further information regarding on the Lansing Smith Soil Treatment Project, please call me at (904)444-6527.

Sincerely,

Dwain Water

G. Dwain Waters
Senior Environmental Affairs Specialist

cc: Gulf Power Company
Mr. M. L. Gilchrist
Mr. J. O. Vick
Mr. M. Markey

FDEP
Mr. M. Kennedy, P.G.

"FINAL REPORT FORMAT - SINGLE"

Accession:	502439
Client:	SOUTHERN COMPANY SERVICES
Project Number:	N/S
Project Name:	PLANT SMITH
Project Location:	SOUTHPORT, FL
Test:	TCLP HAZARDOUS WASTE EVALUATION, METALS
Matrix:	NON-AQUEOUS LEACHATE
QC Level:	I

Lab Id: 003
Client Sample Id: B113 MW-16 (SOIL)
Sample Date/Time: 10-FEB-95 1145
Received Date: 10-FEB-95

Parameters:	Units:	Results:	Rpt Lmts:	Q:	Batch:	Analyst:
SILVER, TCLP (6010)	MG/L	ND	0.01		A6T015	JRR
ARSENIC, TCLP (6010)	MG/L	ND	0.05		R6T015	JRR
BARIUM, TCLP (6010)	MG/L	1.2	0.01		B6T015	JRR
CADMIUM, TCLP (6010)	MG/L	ND	0.005		C6T015	JRR
CHROMIUM, TCLP (6010)	MG/L	ND	0.01		H6T015	JRR
MERCURY, TCLP (7470)	MG/L	ND	0.002		M7T012	SL
LEAD, TCLP (6010)	MG/L	ND	0.05		P6T015	JRR
SELENIUM, TCLP (6010)	MG/L	ND	0.1		S6T015	JRR

Comments:

"Method Report Summary"

Accession Number: 502439
Client: SOUTHERN COMPANY SERVICES
Project Number: N/S
Project Name: PLANT SMITH
Project Location: SOUTHPORT, FL
Test: TCLP HAZARDOUS WASTE EVALUATION, METALS

Client Sample Id:	Parameter:	Unit:	Result:
B113 MW-16 (SOIL)	BARIUM, TCLP (6010)	MG/L	1.2

Analytical**Technologies,**Inc. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

SIGNATURE PAGE

Reviewed by: ______________________
ATI Project Manager

Client: **SOUTHERN COMPANY SERVICES**
BIRMINGHAM, ALABAMA

Project Name: **N/S**
Project Number: **N/S**
Project Location: **SMITH PLANT**
Accession Number: **503141**

Project Manager: **STEVE BEARCE (SO. CO. SERV, AL), MIKE MARKEY (GULF POWER)**
Sampled By: **RICKY HAGENDORFER**

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Analysis Report

Analysis: TOTAL PETROLEUM HYDROCARBONS (9073)

Accession:	S03141
Client:	SOUTHERN COMPANY SERVICES
Project Number:	N/S
Project Name:	N/S
Project Location:	SMITH PLANT
Department:	SEMI-VOLATILE FUELS

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-100

(0) Page 1
Date 03-Mar-95

"FINAL REPORT FORMAT - SINGLE"

Accession:	503141
Client:	SOUTHERN COMPANY SERVICES
Project Number:	N/S
Project Name:	N/S
Project Location:	SMITH PLANT
Test:	TOTAL PETROLEUM HYDROCARBONS (9073)
Analysis Method:	9073 / SW 846, 3rd Edition, September 1986 and Revision 1, July 1992
Extraction Method:	Extraction by Sonication
Matrix:	SOIL
QC Level:	II

Lab Id: 001
Client Sample Id: MW-16 SOIL
Sample Date/Time: 01-MAR-95 1245
Received Date: 02-MAR-95

Batch: TPS064
Blank: B
Dry Weight %: 61
Extraction Date: 03-MAR-95
Analysis Date: 03-MAR-95

Parameter:	Units:	Results:	Rpt Lmts:	Q:
TOTAL PETROLEUM HYDROCARBON	MG/KG	50000	1600	
ANALYST	INITIALS	MV		

Comments:

"Method Report Summary"

Accession Number: 503141
Client: SOUTHERN COMPANY SERVICES
Project Number: N/S
Project Name: N/S
Project Location: SMITH PLANT
Test: TOTAL PETROLEUM HYDROCARBONS (9073)

Client Sample Id:	Parameter:	Unit:	Result:
MW-16 SOIL	TOTAL PETROLEUM HYDROCARBON	MG/KG	50000

ANALYTICAL TECHNOLOGIES, INC. 11 East Olive Road Pensacola, Florida 32514 (904) 474-1001

Analysis Report

Analysis: VOLATILES (8010-8020)

Accession:	503141
Client:	SOUTHERN COMPANY SERVICES
Project Number:	N/S
Project Name:	N/S
Project Location:	SMITH PLANT
Department:	GC/VOA

"FINAL REPORT FORMAT - SINGLE"

Accession: 503141
Client: SOUTHERN COMPANY SERVICES
Project Number: N/S
Project Name: N/S
Project Location: SMITH PLANT
Test: VOLATILES (8010-8020)
Analysis Method: 8010/8020/SW 846, 3rd Edition, September 1986 and Revision 1, July 199
Extraction Method: N/A
Matrix: SOIL
QC Level: II

Lab Id: 001
Client Sample Id: MW-16 SOIL
Sample Date/Time: 01-MAR-95 1245
Received Date: 02-MAR-95

Batch: LUS033
Blank: C
Dry Weight %: 61
Extraction Date: N/A
Analysis Date: 04-MAR-95

Parameter:	Units:	Results:	Rpt Lmts:	Q:
BENZENE	UG/KG	ND	2	
BROMODICHLOROMETHANE	UG/KG	ND	2	
BROMOFORM	UG/KG	ND	3	
BROMOMETHANE	UG/KG	ND	3	
CARBON TETRACHLORIDE	UG/KG	ND	2	
CHLOROBENZENE	UG/KG	ND	2	
CHLOROETHANE	UG/KG	ND	8	
2-CHLOROETHYLVINYLETHER	UG/KG	ND	8	
CHLOROFORM	UG/KG	ND	3	
CHLOROMETHANE	UG/KG	ND	8	
DIBROMOCHLOROMETHANE	UG/KG	ND	8	
1,2-DICHLOROBENZENE	UG/KG	ND	3	
1,3-DICHLOROBENZENE	UG/KG	ND	3	
1,4-DICHLOROBENZENE	UG/KG	ND	3	
DICHLORODIFLUOROMETHANE	UG/KG	ND	8	
1,1-DICHLOROETHANE	UG/KG	ND	2	
1,2-DICHLOROETHANE	UG/KG	ND	2	
1,1-DICHLOROETHENE	UG/KG	ND	2	
1,2-DICHLOROETHENE (TOTAL)	UG/KG	ND	2	
1,2-DICHLOROPROPANE	UG/KG	ND	2	
CIS-1,3-DICHLOROPROPENE	UG/KG	ND	2	
TRANS-1,3-DICHLOROPROPENE	UG/KG	ND	2	
ETHYLBENZENE	UG/KG	3	2	
METHYLENE CHLORIDE	UG/KG	ND	8	
METHYL T-BUTYL ETHER	UG/KG	ND	8	
1,1,2,2-TETRACHLOROETHANE	UG/KG	ND	2	
TETRACHLOROETHENE	UG/KG	ND	5	
TOLUENE	UG/KG	ND	8	
1,1,1-TRICHLOROETHANE	UG/KG	ND	2	
1,1,2-TRICHLOROETHANE	UG/KG	ND	3	
TRICHLOROETHENE	UG/KG	ND	2	
TRICHLOROFLUOROMETHANE	UG/KG	ND	3	
VINYL CHLORIDE	UG/KG	ND	2	
XYLENES (TOTAL)	UG/KG	40	3	
BENZYL CHLORIDE	UG/KG**	ND	8	
BIS(2-CHLOROETHOXY)METHANE	UG/KG**	ND	82	
BIS(2-CHLOROISOPROPYL)ETHER	UG/KG**	ND	82	
BROMOBENZENE	UG/KG**	ND	5	
CHLOROACETALDEHYDE	UG/KG**	ND	82	
CHLOROMETHYLMETHYL ETHER	UG/KG**	ND	82	

"FINAL REPORT FORMAT - SINGLE"

Accession: 503141
Client: SOUTHERN COMPANY SERVICES
Project Number: N/S
Project Name: N/S
Project Location: SMITH PLANT
Test: VOLATILES (8010-8020)
Analysis Method: 8010/8020/SW 846, 3rd Edition, September 1986 and Revision 1, July 199
Extraction Method: N/A
Matrix: SOIL
QC Level: II

Lab Id: 001
Client Sample Id: MW-16 SOIL
Sample Date/Time: 01-MAR-95 1245
Received Date: 02-MAR-95

Parameter:	Units:	Results:	Rpt Lmts:	Q:
2-CHLOROTOLUENE	UG/KG**	ND	2	
DIBROMOMETHANE	UG/KG**	ND	8	
1,1,1,2 TETRACHLOROETHANE	UG/KG**	ND	2	
1,2,3 TRICHLOROPROPANE	UG/KG**	ND	8	
1-CHLOROHEXANE	UG/KG**	ND	8	
BROMOFLUOROBENZENE (PID)	%REC/SURR	120	34-161	
BROMOFLUOROBENZENE (ELCD)	%REC/SURR	0*	75-137	
ANALYST	INITIALS	SB		

Comments:
* SURROGATE OUTSIDE OF ACCEPTANCE LIMITS DUE TO MATRIX INTERFERENCE.

"Method Report Summary"

Accession Number: 503141
Client: SOUTHERN COMPANY SERVICES
Project Number: N/S
Project Name: N/S
Project Location: SMITH PLANT
Test: VOLATILES (8010-8020)

Client Sample Id:	Parameter:	Unit:	Result:
MW-16 SOIL	ETHYLBENZENE	UG/KG	3
	XYLENES (TOTAL)	UG/KG	40

Gulf Power Company
500 Bayfront Parkway
Post Office Box 1151
Pensacola, FL 32520
Telephone 904 444-6111

Gulf Power
the southern electric system

March 3, 1993

Mr. Ed K. Middleswart, P.E.
Florida Department of Environmental Regulation
Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Dear Mr. Middleswart:

PLANT SMITH ENERGY RECOVERY OF OIL CONTAMINATED SOILS

As discussed with you earlier today, Gulf Power is preparing to burn, for energy recovery, five to seven cubic yards of soil contaminated with "On-specification" used oil from a spill which occurred on February 24, 1993 at Plant Smith. The amount of used oil involved with the spill is approximately 200 gallons and displays no hazardous characteristics under the Resource Conservation and Recovery Act (RCRA) or under the used oil rules.

Upon our discussion, there seems to be no prohibition from Plant Smith recovering energy from this material and using incineration as a method of disposal.

In the interim, the contaminated soil will be maintained in a manner to minimize any further environmental contamination.

If you have any questions or need further information on Gulf Power Company's energy recovery of oil contaminated soils, please call me at (904)-444-6527.

Sincerely,

Dwain Waters

G. Dwain Waters
Senior Environmental Affairs Specialist

cc: Mr. J. A. Babbitt
Mr. M. L. Gilchrist
Mr. C. R. Lee
Mr. G. N. Terry
Mr. J. A. Tucker
Mr. J. O. Vick

Gulf Power Company
500 Bayfront Parkway
Post Office Box 1151
Pensacola, FL 32520-1151
Telephone 904 444-6111

Gulf Power
the southern electric system

July 20, 1995

Mr. Ed Middleswart
Air Section
Florida Department of Environmental Protection
160 Governmental Center
Pensacola, Florida 32501

RE: RAP Modification Letter Dated June 12, 1995
Smith Generating Plant
Combustion Turbine Area
FDEP Facility I.D. Number 0387-33308

Dear Mr. Middleswart:

Attached please find a copy of a Remedial Action Plan modification letter regarding the Smith Plant remediation project. On May 26, 1995, Rachel Allen and myself met with you regarding air issues on this project. You indicated that you would like to see a copy of the RAP modification request along with the March 13, 1995 letter which was previously issued.

I believe you were copied on the letter dated June 12, 1995, however, a copy could not be located today by your department. Therefore, I am sending another copy of the subject letter for your review. In a conversation with Mr. Darryl Boudreau of the Cleanup Section, he indicated that his section was reviewing the request and that they would be getting with you to discuss the project in the near future.

If you should have any questions regarding this modification or need some additional information, feel free to give me a call at (904) 444-6573.

Sincerely,

Mike Markey

Richard "Mike" Markey, P.G.
Environmental Affairs

cc: Gulf Power Company
Rachel Allen
Jim Vick
Dwain Waters

SCS - Birmingham
Steve Bearce
Joel Miller

FDEP - Pensacola
Darryl Boudreau

Florida Department of
Environmental Protection

ndum

DARM-PER/GEN-27

TO: District Air Program Administrators
County Air Program Administrators
Bureau of Air Regulation Engineers

FROM: Howard L. Rhodes, Director
Division of Air Resources Management

DATE: July 20, 1995

SUBJECT: Guidance on Air Requirements for Comprehensive Environmental Response, Compensation and Liability (CERCLA) Remediation

Pursuant to 40 CFR 300.400(e), CERCLA remediation is exempt from federal, state and local permits provided the action for which the permit would otherwise be required is undertaken as a CERCLA removal and remediation action, and the activity is carried out on-site. On-site is a defined term, specified as "the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action." Remediation plans, clean-up plans that are developed by EPA and coordinated with the Division of Waste Management, must address the substantive requirements of the state statutes and rules, including the State Implementation Plan (SIP), even though the remediation is exempt from permitting.

Since EPA develops these plans, it is unlikely that it will overlook the substantive requirements of the air program. However, all air permitting authorities should establish contact with their Division of Waste Management counterparts and be prepared to provide assistance, if needed, in developing or reviewing the plan.

HLR/jb/b

RECEIVED
JUL 21 1995
Hopping Green Sams & Smith, P.A.

Florida Department of
Environmental Protection
Memorandum

DARM-OGG-03
Revised

TO: Bureau of Waste Cleanup
Bureau of Air Regulation
District Waste Program Administrators
District Air Program Administrators
District Waste Cleanup Supervisors
District Tanks Supervisors
Local Program Tank Supervisors
Local Air Program Administrators

FROM: John M. Ruddell, Director
Division of Waste Management

Howard L. Rhodes, Director
Division of Air Resources Management

DATE: May 17, 1996

SUBJECT: Revised Guidance on Air Emissions from Petroleum Cleanup Sites

This guidance replaces the February 27, 1996 Guidance, DARM-OGG-03.

This memorandum provides guidance for evaluation of air emissions that will result from the cleanup of petroleum contaminated sites. This guidance replaces all previous guidance memoranda related to air emissions evaluation and control for groundwater treatment air strippers and vacuum extraction systems at petroleum contaminated sites.

The Bureau of Waste Cleanup is responsible for the cleanup of many petroleum contaminated sites throughout the state. The cleanup systems on these sites will not be identical but will have similarities as far as considerations for air emissions control and evaluation. It is the intent to avoid duplicate efforts by Air and Waste Cleanup program staff in the evaluation of these cleanup systems. Therefore, the staff of the Bureau of Waste Cleanup and contracted local program offices will evaluate air emissions sources from existing and proposed petroleum contaminated site cleanup systems in accordance with the provisions of this memorandum. Provided that systems are designed and operated in accordance with the terms of this memorandum, the Remedial Action Plan Approval Order will serve as evidence that air emissions concerns have been adequately addressed. No separate air permit will be required for the operation of the cleanup system, as long as the procedures outlined in this memo for air emissions evaluation, treatment, and monitoring are followed unless the soil remediation unit is located at a facility that is a Title V source. If the unit is at a Title V source, it should be reported as an emissions unit and should be included in the Title V permit pursuant to Rules 62-213.420 and 440, F.A.C.

It is assumed that air emissions sources associated with petroleum cleanup sites will be temporary in nature, that is, will be operated less than 5 years. The Remedial Action Plan must include an estimate of the site cleanup duration. If the cleanup is projected to last greater than 5 years, the District Air Program Administrator must be contacted to obtain an air permit or an exemption under the provisions of Chapter 62-4, F.A.C.

The maximum air emissions from a cleanup site may not exceed 15 pounds per day of volatile organic compounds (VOCs), as determined by EPA Method 18 or other methods with prior approval of the Division of Air Resources Management and the Division of Waste Management. When several technologies are used together on a cleanup site, the air emissions from the multiple sources must be considered together in determining the combined air impacts from the site cleanup activities and the need for air emissions control. The emissions may be determined by direct measurement of the air stream for vapor extraction systems or on the basis of mass transfer of hydrocarbons from water phase to air phase in an air stripper system.

Recent years have seen the development of several new approaches to site cleanup. These processes each have different air emissions potentials and concerns due to the nature of the site cleanup process. A brief description of each process and the air emissions evaluation and control procedures for the process are described individually below.

Vapor extraction

Soil vapor extraction (SVE) or vacuum extraction is an accepted and proven technique for removing volatile organic compounds from the unsaturated zone of soils. The process typically involves several screened vacuum extraction lines, installed either vertically or horizontally, that are manifolded together to a single mechanical equipment system. In this technology, a vacuum is applied to the soil matrix to create a negative pressure gradient that causes movement of vapors toward the extraction wells. Vacuum extraction systems, as distinguished from bioventing systems, typically have relatively high vacuums and air flow rates. These systems primarily remediate soil by causing the volatilization of hydrocarbons adsorbed to soil through the induced vacuum and air flow through the soil. These systems are more effective on lighter petroleum products that are composed predominantly of compounds with higher vapor pressures. The remediation typically removes the greatest mass of VOCs and results in highest concentrations of recovered vapors in the first few days or weeks of operation.

The equipment system typically consists of a blower to create a vacuum, a knock out tank to reduce moisture, an air emissions treatment device, and valves, pressure gauges and air flow meters. Several variations of air emissions devices may be used, including activated carbon, catalytic oxidation, thermal oxidation or a biofilter. The type of air emissions treatment equipment selected will depend on anticipated air flow rates and VOC concentrations.

Vacuum extraction systems will generally be proposed where sites have soils excessively contaminated with VOCs. At such sites, due to the relatively high rates of hydrocarbon recovery in the early stages of vacuum extraction system operation, air emissions control at startup is generally mandatory. The Bureau of Waste Cleanup will consider site specific considerations if there are no excessively contaminated soils present or it is determined the petroleum hydrocarbons present will not be readily volatilized. The air emissions treatment device shall continue operation for the first 30 days of the vacuum extraction system operation. At the end of 30 days, air samples of recovered vapors shall be collected from the recovered vapor air stream without the air emissions treatment device. The air emissions, after controls, must be less than 15 pounds per day. Samples shall be collected in a tedlar bag and analyzed by EPA Method 18 or other methods, with prior approval of the Division of Air Resources Management and the Division of Waste Management, to determine total VOC concentrations. The VOC analytical result shall be used to calculate the daily pounds of VOCs recovered based on the measured air flow rate. If the recovered VOCs (including any other emission sources from the site remediation) are less than 15 pounds per day without controls, air emissions treatment may be discontinued. If the recovered VOCs are 15 pounds per day or greater, the air emissions control shall continue until subsequent samples demonstrate the VOC air emissions are less than 15 pounds per day.

Bioventing

Bioventing is an in-situ remediation technology that uses indigenous microorganisms to biodegrade organic constituents adsorbed to soils in the vadose zone. The activity of the indigenous bacteria is enhanced by inducing flow of air (to supply oxygen for microorganism metabolism) through the unsaturated zone. The system design is similar to a vacuum extraction system in that there will be extraction (or injection) wells manifolded to an equipment system which includes a blower. The system design is different from soil vacuum extraction, however, in that air flow rates are generally much lower and air may be either injected to the unsaturated zone or withdrawn by applying a vacuum. Bioventing is most often used at sites with mid-weight petroleum products such as diesel fuels and jet fuel because lighter fuels such as gasoline tend to volatilize readily and can be removed more rapidly with soil vapor extraction.

Because this process relies on degradation of petroleum hydrocarbons by microorganisms rather than volatilization, air emissions control is not required. To qualify as bioventing and operation without air emissions control, the Remedial Action Plan must demonstrate that the remediation mechanism will be primarily biodegradation and must show that the uncontrolled air emissions are less than 15 pounds per day. This will generally necessitate the performance of a pilot study and subsequent system design (air flow rates) based on respiration rates established from the pilot study. Additionally, if the site is gasoline contaminated, startup air samples shall be obtained to verify no significant recovery of vapors by the system operation.

In-situ Sparging

In-situ air sparging is an in-situ remedial technology that reduces concentrations of volatile constituents in petroleum products that are adsorbed to soils in the saturated zone and dissolved in the groundwater. This technology involves the injection of contaminant-free air into the subsurface saturated zone, enabling a phase transfer of hydrocarbons from dissolved state to a vapor phase. The air is then vented through the unsaturated zone. Soil vapor extraction is used in conjunction with in-situ sparging to recover the volatilized hydrocarbons. Air sparging is generally more applicable to the lighter petroleum constituents and therefore most effective on gasoline contaminated sites. There is evidence to show that in-situ bioremediation may also be induced during in-situ sparging, however, for the purpose of this discussion it is assumed that the remediation mechanism is predominantly volatilization of petroleum hydrocarbons. A separate section below describes "biosparging" as a distinct process with different air emissions control considerations.

In-situ sparging systems are required to be operated in conjunction with a soil vapor extraction system and the soil vapor extraction system is required to have an air emissions treatment system at system startup due to the relatively high rates of hydrocarbon recovery in the early stages of in-situ sparging and vacuum extraction system operation. The air emissions treatment device shall continue operation for the first 30 days of the in-situ sparging and vacuum extraction system operation. At the end of 30 days, air samples of recovered vapors shall be collected from the recovered vapor air stream without the air emissions treatment device. The air emissions, after controls, must be less than 15 pounds per day. Samples shall be collected in a tedlar bag and analyzed by EPA Method 18 or other methods with prior approval of the Division of Air Resources Management and the Division of Waste

Management to determine total VOC concentrations. The VOC analytical result shall be used to calculate the daily pounds of VOCs recovered based on the measured air flow rate. If the recovered VOCs (including any other emissions sources from the site remediation) are less than 15 pounds per day without controls, air emissions treatment may be discontinued. If the recovered VOCs are 15 pounds per day or greater, the air emissions control shall continue until subsequent air samples demonstrate the recovered vapors are less than 15 pounds per day uncontrolled.

Biosparging

Biosparging is an in-situ remediation technology that uses indigenous microorganisms to biodegrade organic constituents in the saturated zone. In biosparging, air and nutrients (if needed) are injected into the saturated zone to increase the biological activity of the indigenous microorganisms. The biosparging process is similar to in-situ air sparging. However, while in-situ air sparging removes constituents primarily through volatilization, biosparging promotes biodegradation of constituents rather than volatilization. Biosparging systems will typically have lower air flow rates designed on the basis of providing adequate oxygen supply to optimize biological activity without causing significant volatilization of hydrocarbons.

A biosparging system may be operated along with a bioventing system, a soil vapor extraction system, or with no soil venting system at all. This will depend to a large degree on the extent and nature of contamination of the unsaturated zone. If the extent of contamination to the unsaturated zone is not great enough to warrant any soil remediation system, no soil venting system is required to be operated with biosparging. If the extent of soil contamination warrants a soil remediation system, either vapor extraction or bioventing may be operated in conjunction with biosparging. If a vapor extraction system is proposed, the air emissions control and evaluation procedures described above under "soil vapor extraction" are applicable. If a bioventing system is proposed and the RAP demonstrates that both the biosparging system and bioventing systems will be predominantly bioremediation mechanisms and are designed on the basis of respiration rates of microorganisms, no air emissions control is required if it can be shown that the uncontrolled air emissions are less than 15 pounds per day.

Air Stripping of Recovered Groundwater

Air stripping in the context of this memo refers to any process in which dissolved hydrocarbons in recovered groundwater are transferred from dissolved phase to air phase through mechanical processes. The most common types are packed tower air strippers, aeration tanks, or tray-type aerators. Typically the recovery rate of hydrocarbons dissolved in groundwater results in a relatively low air emissions impact compared with the vacuum extraction and in-situ sparging technologies discussed above. The Department's experience is that air stripping of recovered groundwater generally results in relatively low air emissions that do not require treatment. The evaluation is to be based on the concentration of total volatile organic aromatics (VOAs) in recovered groundwater as determined by EPA Method 602. It shall be assumed that the results of the 602 analysis (BETX) represents 10 percent of the total VOCs. Considering the relatively low effluent standards for most treated groundwater disposal options, it should be assumed that all VOCs measured in groundwater are converted to the air phase. The VOC analytical result shall be used to calculate the daily pounds of VOCs recovered based on the design groundwater recovery rate. If the recovered VOCs (including any other emissions sources from the site remediation) are less than 15 pounds per day, air emissions treatment is not necessary. If the recovered VOCs are 15 pounds per day or greater, air emissions treatment shall be required.

If both soil vapor extraction and air stripping of recovered groundwater are operated on a site, it is generally appropriate to use the air emissions control device on the soil vapor extraction system first. Treating the vacuum extraction air emissions alone will generally reduce total air emissions to less than 15 pounds per day of VOCs. The air emission control shall continue until subsequent samples demonstrate the vapor emissions are less than 15 pounds per day.

Nuisance considerations

Notwithstanding the evaluation process described above, the RAP shall consider the location of the air emissions sources relative to receptors in the vicinity which could result in odor nuisance, or health concerns due to the direct proximity to the emissions source. If necessary, the RAP shall include recommendations for equipment location, additional exhaust stack height or air emissions treatment to address such concerns.

Alternate Air Emissions Evaluation Methods

The pounds/day of VOCs method to determine the need for air emissions treatment is the preferred method. If this evaluation results in a determination that air emissions control equipment is necessary, a supplemental evaluation of ambient air impacts based on plume dispersion modeling may be performed for verification prior to a final decision to provide an air emissions control device. The procedures in Attachment A shall be followed to make this demonstration.

Listed below are the ambient reference concentrations (ARCs) developed by the Division of Air Resources Management (DARM) for some of the petroleum constituents. This table includes both a column for 24 hour ARCs and a column for annual ARCs.

The 24 hour ARC is derived from occupational exposure levels such as the PELs set by OSHA or Threshold Limit Values that are based on the American Conference of Governmental Industrial Hygienists (ACGIH). The DARM has derived an equation to determine the 24 hour ARC values for different petroleum constituents. The equation is: TLV/420 = 24 hr ARC. Please note that these values are only utilized for short term exposures. Any type of air emissions which occur over a longer period of time should be evaluated based on the estimated annual average ambient concentration and compared against the reference values in EPA's Integrated Risk Information System (IRIS) database. Since five years will be the determining factor on whether an air permit is required, the Department will utilize the five year period as a cutoff between the use of a 24 hour ARC or an annual ARC. Any remedial action plan which estimates air emissions over a five year period should use the annual ARC values.

The TSCREEN Model will provide a 1 hour concentration as the default output. This model can also convert to a 24 hour concentration. Therefore, when a Remedial Action Plan proposes an air emission of less than five years, the model output for a 24 hour emission can be compared directly to the table shown below. However, if the Remedial Action Plan estimates air emissions over five years, the TSCREEN model does not convert from a 1 hour average to an annual average. Therefore one must use a conversion factor from a 1 hour average to an annual average and hand calculate these numbers. This conversion factor is 0.08.

This table does not include a 24 hour ARC for MTBE or an annual ARC for naphthalene. One should substitute the value provided and compare this value to that calculated from the TSCREEN

Revised Guidance on Air Emissions from
Petroleum Cleanup Sites
May 17, 1996
Page Six

model. For example, the 24 hour ARC for MTBE should be 3000 ug/m3 and the annual ARC for naphthalene should be 119 ug/m3.

With the exception of naphthalene, the polynuclear aromatic hydrocarbons (PAHs) were not included on this table because: (1) There are only two ARC values available; (2) All of the PAHs are semi-volatile organics with a relatively low Henry's Constant. Therefore, the PAHs emitted to the air should be of a low magnitude; (3) The concentrations of PAHs discovered in the soil or the groundwater are typically less than 1 ppm (1000 ppb).

CHEMICALS	24hr ARC ug/m3	annual ARC ug/m3
benzene	7	0.12
1,2-Dicholroethane	95	0.038
1,2-Dibromoethane (EDB)	71	0.0045
MTBE	----	3000
ethylbenzene	1033	1000
naphthalene	119	----
toluene	448	400
xylene	1033	80

JMR/HLR/h

Attachment

ATTACHMENT "A"

MODELING OF AIR EMISSIONS

The Department recommends the use of TSCREEN when determining the appropriate stack height of an air emission and whether air emission controls can be removed from a source of air emissions

Purpose of TSCREEN

TSCREEN is an easy-to-use, interactive, menu-driven, point-source screen model. The purpose of TSCREEN is to quickly and easily screen a point source emission to determine the maximum downwind concentration and the location of this maximum concentration. TSCREEN applies to a continuous point source and includes in the model a built-in worst case meteorology. Worst case meteorology is that combination of wind speeds and stability classes that can physically occur and runs all these cases for the "X" direction. It also uses the standard Gaussian equation, the Briggs plume rise and can consider nearby buildings for downwash, and/or account for fencelines.

Averaging Times

The default averaging time in the TSCREEN model is 1 hour. The maximum concentration can be calculated for additional averaging times selected from the menu. These times include: 15 minutes, 30 minutes, 3 hours, 8 hours, and 24 hours. To associate the ambient reference concentrations (ARC) developed by the Division of Air Resources Management with the results from TSCREEN, one should use the 24 hour averaging time and compare this to the 24 hour ARC.

Model Input

1. Always use 293° K for the ambient air temperature. An estimate should be made of the expected stack exit gas temperature.

2. The flat terrain should be used for sites in Florida.

3. Always use the rural terrain, except if the site is in the center of a large metropolitan area.

4. If a building is within the distance of five times the largest dimension of the building (height, width or length), then the building should be included in the model.

5. If a receptor is within close proximity of the stack (e.g., intake to ventilation system), flagging of this receptor should be included.

6. The receptor height for people standing on the ground should be 0.0.

7. In most cases use a small value (1.0 meter) for the distance to the outside of the site property unless institutional control of site access is possible.

8. The TSCREEN model can only calculate from one source. If there is more than one source one should combine the concentrations and input this data for the more conservative stack (e.g., lower exit temperature, lower velocity, shorter stack), or use the Industrial Source Complex Model.

9. The program will calculate the 1 hour maximum concentration in ug/m3. Use the 24 hour averaging time and compare this result to the ambient reference concentrations provided below. If the results show that the emissions are below ARC at the area of greatest impact, then either the stack

height is appropriate or the air emission control may be discontinued after concurrence from the Department (or local program).

Model Output

The SCREEN model output begins with the times and date that the model was run. Next, there is the model name and version number. Following the model name is the run's title and the user input. Next, the output contains a summary of results showing the maximum concentration and the distance to the maximum. Next, there is a list of concentrations for TSCREEN's automated distances. Finally, there is a listing of the cavity concentrations. Note: cavity concentrations are only listed if the effects of building downwash are being considered. The 24 hour averaging time result is at the end of the model output.

How can TSCREEN be obtained?

TSCREEN can be obtained from the EPA's Support Center for Regulatory Air Models (SCRAM) Bulletin Board System (BBS). The telephone number for access by modem is 919/541-5742.

BEST AVAILABLE COPY

8-24-95

FLORIDA

Department of Environmental Protection

Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

Dwain,
Please advise on method 25A.
Vick

August 23, 1995

Mr. J. O. Vick
Supervisor of Environmental Affairs
Gulf Power Company
Post Office Box 1151
Pensacola, Florida 32520

Dear Mr. Vick:

This is in response to the June 12 Remedial Action Plan (RAP) modification request submitted for your facility, Lansing Smith Generation Plant, Combustion Turbine Area (DEP# 0387-33308), located in Bay County.

We have reviewed the request and have determined that the requested modifications to the RAP are conditionally acceptable and are hereby approved with the following conditions:

1. The As-Built drawings may be submitted eight months after the initiation of the RAP, making the drawings due on or before June 24, 1996.

2. Quarterly effectiveness reports will be required for the first year of remedial action, with reporting thereafter on a semi-annual basis. The first quarter's report will be due on or before January 24, 1996.

3. A bioremediation study will not be required unless bioremediation is deemed necessary after the primary treatment system has been evaluated. If bioremediation is necessary, a plan should be submitted which contains at a minimum, the proposed nutrient mixture, application rate, method of application and the assurances that groundwater and Class II waters of the State will not be impacted.

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

ATTACHMENT C

4. Soil vapor extraction air emissions treatment will not be required as long as confirmation samples of the emissions are collected and it is shown that they meet state ambient air quality standards. The confirmation sampling shall consist of two daily samples from the first two days of extraction, two weekly samples from the first two weeks and one sample collected a month after startup. If the results indicate that emissions meet standards, then the confirmation sampling shall be considered complete. However, if the sampling results are above standards, then the system will have to be shut down and a treatment system installed.

Methods
TO3 or 18

The above modifications amend our May 19, 1995, RAP approval order. Should you have any questions, please contact Darryl Boudreau, Cleanup Section, at (904) 444-8360.

Sincerely,

Thomas W Moody

Thomas W. Moody, P.E.
Waste Management Program
Administrator

TWM:dbg

cc: Steve Bearce, SCS

Department of Environmental Protection

Lawton Chiles
Governor

Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Virginia B. Wetherell
Secretary

Received
5/24/95

Mr. J. O. Vick, Supervisor
Environmental Affairs
Gulf Power Company
Post Office Box 1151
Pensacola, Florida 32520

Dear Mr. Vick:

This is in response to the February 28 Remedial Action Plan (RAP) submitted for your facility, Lansing Smith Generation Plant, Combustion Turbine Area (DEP# 0387-33308), located in Bay County.

We have determined that the actions proposed in the RAP, along with the condition detailed below, provide reasonable assurance that the contaminant concentrations will be reduced to the levels set forth in Chapter 62-770, Florida Administrative Code (FAC). Therefore, pursuant to Rule 62-770.700(3), FAC, the RAP is approved, with the following condition:

Conduct a preliminary study to clarify the final biodegradation phase of remediation and submit a report of the findings to the Department on the first anniversary of the RAP approval.

You are now required to initiate the remedial actions described in the RAP and addendums within two months of receipt of this Order. These remedial actions are to be implemented in accordance with Chapter 62-770, FAC, and shall continue until a cleanup of the contaminated area to the target levels set forth in Rule 62-770.730(5), FAC, is achieved. The effectiveness monitoring program for the groundwater at this site should be conducted as follows:

Sample Source	Parameter**	Frequency	Duration
Recovery Influent	EPA Methods 602 (+ MTBE) & 610	Monthly/ Quarterly	Year One/ Thereafter
Treated Effluent	EPA Methods 602 (+ MTBE) & 610	Weekly/ Monthly/ Quarterly	Month One/ Year One/ Thereafter

Background: MW-15 Downgradient: MW-3*, MW-3D*, MW-14* and MW-16*	EPA Methods 602 (+ MTBE) & 610	Monthly/ Quarterly	Year One/ Thereafter
Downgradient: MW-9A	EPA Methods 602 (+ MTBE) & 610	Annual	During Remediation
MW-1,2,3,3D,4,7,7A, 8,8A,9,9A,10,11,12 13,14,15 & 16	GroundWater Elevations Depth and Total Volume of Free Product	Monthly/ Quarterly	Year One/ Thereafter

*Replacement wells after soil excavation
**Equivalent methods listed in Rule 62-770.600(8)(b) are acceptable.
Water quality should be sampled after free product has been eliminated.

The soil effectiveness monitoring should be conducted as follows:

<u>Sample Source</u>	<u>Parameters</u>	<u>Frequency</u>	<u>Duration</u>
Vapor Effluent	**EPA Method TO3 or 18**	**Monthly**	**Two Month Minimum**
Soils	**OVA Headspace Analysis**	**Quarterly**	**During Remediation**

The soil remediation must continue until the clean soil criteria in the enclosed Petroleum Cleanup Program Guidelines ESS-4 and ESS-5 are met.

The results of the above analyses should be submitted to the Department in the form of quarterly reports. The reports should include water levels, total volume of recovered groundwater, downtime for recovery wells, laboratory reports with the chain of custody and applicable summary tables and maps.

You are also required to submit record drawings ("as-built" drawings) of the treatment systems within four months of receipt of this Order. These drawings must be sealed by a professional engineer.

Gulf Power Company
500 Bayfront Parkway
Post Office Box 1151
Pensacola, FL 32520-1151
Telephone 904 444-6111

~~MLG~~
~~JOV~~
~~M Hadley~~
~~GDW~~(last)
ENB 10-5-6.
Air Op
Re

Gulf Power
the southern electric system

August 10, 1995

Mr. Ed K. Middleswart
Florida Department of Environmental Protection
Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Dear Mr. Middleswart:

RE: PLANT SMITH ENERGY RECOVERY OF OIL CONTAMINATED SOILS

Pursuant to my conversation with Bob Kriegel of your staff on August 7, 1995 and our previous correspondences regarding the energy recovery of oil contaminated soils at Gulf Power facilities, Gulf Power is preparing to burn for energy recovery and disposal purposes approximately 90 cubic yards of contaminated soil from a cleanup of the area near the Lansing Smith Used Oil Tank. The amount of "on-specification" used oil involved in the spill is approximately 853 gallons and displays no hazardous characteristics under the Resource Conservation and Recovery Act (RCRA) or under the used oil rules.

Upon my conversation with Bob Kriegel and our previous discussions, there seems to be no prohibition from Plant Smith recovering energy from this material and using incineration as a method of disposal.

In the interim, the contaminated soil will be maintained in a manner to minimize any further environmental contamination.

If you have any questions or need further information on Gulf Power Company's energy recovery or oil contaminated soils, please call me at (904) 444-6527.

Sincerely,

Dwain Waters

G. Dwain Waters
Air Programs Coordinator

See Distribution List

DISTRIBUTION LIST

<u>Gulf Power Company</u>
Mr. M. L. Gilchrist
Mr. J. O. Vick
Mr. M. Markey
Mr. S. H. Houston
Mr. J. A. Babbitt

Post Office Box 1151
Pensacola, FL 32520
Telephone 904 444-6111

~~MLG~~
~~JAT~~
~~JOV~~
Gulf Power ~~GDW~~
The Southern Electric System

August 24, 1993

Mr. Ed K. Middleswart, P.E.
Florida Department of Environmental Protection
Northwest District
160 Governmental Center
Pensacola, Florida 32501-5794

Dear Mr. Middleswart:

OIL CONTAMINATED MATERIALS

On August 18, 1993, Andy Allen of your staff and I discussed current regulations covering energy recovery of oil contaminated soils. Pursuant to those discussions, I agreed to document to the department Gulf's current understanding of recycling requirements and overview our present practices.

Recently, Gulf Power has made several notifications to the waste and air sections of FDEP regarding energy recovery operations concerning oil contaminated soils at Plants Smith and Scholz. Florida regulations currently exempt operations of this type for electric utility sources as long as the material is considered non-hazardous and the material is handled in a responsible manner. In lieu of continuing the process of making courteous notifications, the Department and Gulf have reached an agreement that no further notification is needed for small de-minus operations. Operations involving major cleanup operations will continue to be noticed by Gulf for monitoring purposes. For example, Gulf Power is preparing a Contamination Assessment Report (CAR) for a situation at Plant Smith. Energy recovery of this type of material will be managed on a case by case basis as part of an approved cleanup plan.

If you have any questions or need further information, please call me at (904) 444-6527.

Sincerely,

Dwain Waters

G. Dwain Waters
Senior Environmental Affairs Specialist

cc: <u>Florida Department of Environmental Protection</u>
Mike Kennedy

<u>Gulf Power Company</u>
M. L. Gilchrist
J. A. Tucker
J. O. Vick

EVS 12

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

PHASE I ACID RAIN PERMIT

Issued to: Gulf Power Company-Lansing Smith
Operated by: Gulf Power Company
Effective: January 1, 1995 to December 31, 1999

Summary of Previous Actions

This page will be replaced to document new EPA actions each time a new action is taken by the Agency. The following actions have been taken:

1. Draft permit, including SO_2 compliance plan, issued for public comment (See page 1)	November 4, 1994
2. SO_2 portion of permit finalized and issued	December 27, 1994
3. Permit revised to activate the conditional SO_2 Substitution Plan for Units 1 and 2, issued as an administrative amendment (See page 3 and 4)	February 14, 1995
4. Permit revised to include a draft nitrogen oxides Emissions Averaging Plan for Units 1 and 2, issued for public comment on the NO_x portion only, consistent with 40 CFR part 76 (as promulgated on April 13, 1995) (see page 3(a) and 4(a) and the NO_x compliance plan)	September 21, 1995

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
345 COURTLAND STREET N.E.
ATLANTA GEORGIA 30365

Plant Name: Lansing Smith
State: Florida
ORIS Code: 0643

Present Action

5. Permit revised to deactivate and terminate the SO_2 substitution plan for Units 1 and 2 and to terminate the NO_x averaging plan for Units 1 and 2, issued as an administrative amendment
(See page 3, 3(a), 4, and 4(a) and the SO_2 and NO_x compliance plans)

Bruce P. Miller for   12/14/95

Signature   *Date*

Winston A. Smith
Director, Air, Pesticides and Toxics Management Division
U.S. Environmental Protection Agency, Region 4
345 Courtland Street, N.E.
Atlanta, Georgia 30365
Telephone: (404) 347-3043   Facsimile: (404) 347-5207

Plant Name: Lansing Smith
State: Florida
ORIS Code: 0643
Boiler ID#: 0001

Phase I SO_2 Allowance Allocation

	1995	1996	1997	1998	1999
Table 1 *40 CFR 73.10*	N/A	N/A	N/A	N/A	N/A
Phase I Extension *40 CFR 72.42*	N/A	N/A	N/A	N/A	N/A
Substitution *40 CFR 72.41*	N/A	N/A	N/A	N/A	N/A
Reduced Utilization *40 CFR 72.43*	N/A	N/A	N/A	N/A	N/A

Comments, notes and justifications regarding permit decisions, and changes made to the permit application forms during the review process:

See changes made to the Permit Application form on Statement of Basis, page 2.

Consistent with the Partial Settlement Agreement in Environmental Defense Fund v. Carol M. Browner, No. 93-1203 (executed on May 4, 1994):

1. EPA approves the termination of a substitution plan for this unit for 1995-1999 in which it was designated as a substitution unit for Gulf Power Company-Crist Unit 7, a Phase I unit. In this plan, Lansing Smith Unit 2, Crist Unit 4 and Unit 5, and Scholz Unit 1 and Unit 2 were also designated as substitution units by the Phase I unit.

R. SCOTT DAVIS	R. Scott Davis	12-11-95
Permit Reviewer	*Signature*	*Date*

Statement of Basis. Part B

Plant Name: Lansing Smith
State: Florida
ORIS Code: 0643
Boiler ID#: 0001

NO_x Compliance Plan

R. SCOTT DAVIS	R. Scott Davis	12-11-95
Permit Reviewer	*Signature*	*Date*

Statement of Basis. Part B

Plant Name: Lansing Smith
State: Florida
ORIS Code: 0643
Boiler ID#: 0002

Phase I SO_2 Allowance Allocation

	1995	1996	1997	1998	1999
Table 1 *40 CFR 73.10*	N/A	N/A	N/A	N/A	N/A
Phase I Extension *40 CFR 72.42*	N/A	N/A	N/A	N/A	N/A
Substitution *40 CFR 72.41*	N/A	N/A	N/A	N/A	N/A
Reduced Utilization *40 CFR 72.43*	N/A	N/A	N/A	N/A	N/A

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1. EPA approves the termination of a substitution plan for this unit for 1995-1999 in which it was designated as a substitution unit for Gulf Power Company-Crist Unit 7, a Phase I unit. In this plan, Lansing Smith Unit 1, Crist Unit 4 and Unit 5, and Scholz Unit 1 and Unit 2 were also designated as substitution units by the Phase I unit.

R. SCOTT DAVIS	R. Scott Davis	12-11-95
Permit Reviewer	*Signature*	*Date*

Statement of Basis. Part B

Plant Name: Lansing Smith
State: Florida
ORIS Code: 0643
Boiler ID#: 0002

NO_x Compliance Plan

R. SCOTT DAVIS R. Scott Davis 12-11-95
Permit Reviewer *Signature* *Date*

Phase II Permit Application

For more information, see instructions and refer to 40 CFR 72.30 and 72.31 and Chapter 62-214, F.A.C.

This submission is: ☒ New ☐ Revised

STEP 1
Identify the source by plant name, State, and ORIS code from NADB

Lansing Smith Plant Name	FL State	643 ORIS Code

STEP 2
Enter the boiler ID# from NADB for each affected unit, and indicate whether a repowering plan is being submitted for the unit by entering "yes" or "no" at column c. For new units, enter the requested information in columns d and e

	Compliance Plan			
a	b	c	d	e
Boiler ID#	Unit Will Hold Allowances in Accordance with 40 CFR 72.9(c)(1)	Repowering Plan	New Units Commence Operation Date	New Units Monitor Certification Deadline
1	Yes	No		
2	Yes	No		
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			
	Yes			

STEP 3
Check the box if the response in column c of Step 2 is "Yes" for any unit

☐ For each unit that will be repowered, the Repowering Extension Plan form is included and the Repowering Technology Petition form has been submitted or will be submitted by June 1, 1997.

Pl. Name (from Step 1)

STEP 4
Read the standard requirements and certification, enter the name of the designated representative, and sign and date

Standard Requirements

Permit Requirements.

(1) The designated representative of each Acid Rain source and each Acid Rain unit at the source shall:
(i) Submit a complete Acid Rain part application (including a compliance plan) under 40 CFR part 72, Rules 62-214.320 and 330, F.A.C. in accordance with the deadlines specified in Rule 62-214.320, F.A.C.; and
(ii) Submit in a timely manner any supplemental information that the permitting authority determines is necessary in order to review an Acid Rain part application and issue or deny an Acid Rain permit;
(2) The owners and operators of each Acid Rain source and each Acid Rain unit at the source shall:
(i) Operate the unit in compliance with a complete Acid Rain part application or a superseding Acid Rain part issued by the permitting authority; and
(ii) Have an Acid Rain Part.

Monitoring Requirements.

(1) The owners and operators and, to the extent applicable, designated representative of each Acid Rain source and each Acid Rain unit at the source shall comply with the monitoring requirements as provided in 40 CFR part 75, and Rule 62-214.420, F.A.C.
(2) The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the unit with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program.
(3) The requirements of 40 CFR part 75 shall not affect the responsibility of the owners and operators to monitor emissions of other pollutants or other emissions characteristics at the unit under other applicable requirements of the Act and other provisions of the operating permit for the source.

Sulfur Dioxide Requirements.

(1) The owners and operators of each source and each Acid Rain unit at the source shall:
(i) Hold allowances, as of the allowance transfer deadline, in the unit's compliance subaccount (after deductions under 40 CFR 73.34(c)) not less than the total annual emissions of sulfur dioxide for the previous calendar year from the unit; and
(ii) Comply with the applicable Acid Rain emissions limitations for sulfur dioxide.
(2) Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act.
(3) An Acid Rain unit shall be subject to the requirements under paragraph (1) of the sulfur dioxide requirements as follows:
(i) Starting January 1, 2000, an Acid Rain unit under 40 CFR 72.6(a)(2); or
(ii) Starting on the later of January 1, 2000 or the deadline for monitor certification under 40 CFR part 75, an Acid Rain unit under 40 CFR 72.6(a)(3).
(4) Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program.
(5) An allowance shall not be deducted in order to comply with the requirements under paragraph (1)(i) of the sulfur dioxide requirements prior to the calendar year for which the allowance was allocated.
(6) An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or the written exemption under 40 CFR 72.7 and 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization.
(7) An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right.

Nitrogen Oxides Requirements. The owners and operators of the source and each Acid Rain unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides.

Excess Emissions Requirements.

(1) The designated representative of an Acid Rain unit that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77.
(2) The owners and operators of an Acid Rain unit that has excess emissions in any calendar year shall:
(i) Pay without demand the penalty required, and pay upon demand the interest on that penalty, as required by 40 CFR part 77; and
(ii) Comply with the terms of an approved offset plan, as required by 40 CFR part 77.

Recordkeeping and Reporting Requirements.

(1) Unless otherwise provided, the owners and operators of the source and each Acid Rain unit at the source shall keep on site at the source each of the following documents for a period of 5 years from the date the document is created. This period may be extended for cause, at any time prior to the end of 5 years, in writing by the Administrator or permitting authority:
(i) The certificate of representation for the designated representative for the source and each Acid Rain unit at the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with Rule 62-214.350, F.A.C.; provided that the certificate and documents shall be retained on site at the source beyond such 5-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative;
(ii) All emissions monitoring information, in accordance with 40 CFR part 75;
(iii) Copies of all reports, compliance certifications, and other submissions and all records made or required under the Acid Rain Program; and,

Plant Name (from Step 1)

Recordkeeping and Reporting Requirements (cont.)

(iv) Copies of all documents used to complete an Acid Rain part application and any other submission under the Acid Rain Program or to demonstrate compliance with the requirements of the Acid Rain Program.

(2) The designated representative of an Acid Rain source and each Acid Rain unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR part 72 subpart I and 40 CFR part 75.

Liability.

(1) Any person who knowingly violates any requirement or prohibition of the Acid Rain Program, a complete Acid Rain part application, an Acid Rain part, or a written exemption under 40 CFR 72.7 or 72.8, including any requirement for the payment of any penalty owed to the United States, shall be subject to enforcement pursuant to section 113(c) of the Act.
(2) Any person who knowingly makes a false, material statement in any record, submission, or report under the Acid Rain Program shall be subject to criminal enforcement pursuant to section 113(c) of the Act and 18 U.S.C. 1001.
(3) No permit revision shall excuse any violation of the requirements of the Acid Rain Program that occurs prior to the date that the revision takes effect.
(4) Each Acid Rain source and each Acid Rain unit shall meet the requirements of the Acid Rain Program.
(5) Any provision of the Acid Rain Program that applies to an Acid Rain source (including a provision applicable to the designated representative of an Acid Rain source) shall also apply to the owners and operators of such source and of the Acid Rain units at the source.
(6) Any provision of the Acid Rain Program that applies to an Acid Rain unit (including a provision applicable to the designated representative of an Acid Rain unit) shall also apply to the owners and operators of such unit. Except as provided under 40 CFR 72.44 (Phase II repowering extension plans), and except with regard to the requirements applicable to units with a common stack under 40 CFR part 75 (including 40 CFR 75.16, 75.17, and 75.18), the owners and operators and the designated representative of one Acid Rain unit shall not be liable for any violation by any other Acid Rain unit of which they are not owners or operators or the designated representative and that is located at a source of which they are not owners or operators or the designated representative.
(7) Each violation of a provision of 40 CFR parts 72, 73, 75, 77, and 78 by an Acid Rain source or Acid Rain unit, or by an owner or operator or designated representative of such source or unit, shall be a separate violation of the Act.

Effect on Other Authorities. No provision of the Acid Rain Program, an Acid Rain part application, an Acid Rain part, or a written exemption under 40 CFR 72.7 or 72.8 shall be construed as:

(1) Except as expressly provided in title IV of the Act, exempting or excluding the owners and operators and, to the extent applicable, the designated representative of an Acid Rain source or Acid Rain unit from compliance with any other provision of the Act, including the provisions of title I of the Act relating to applicable National Ambient Air Quality Standards or State Implementation Plans;
(2) Limiting the number of allowances a unit can hold; *provided*, that the number of allowances held by the unit shall not affect the source's obligation to comply with any other provisions of the Act;
(3) Requiring a change of any kind in any State law regulating electric utility rates and charges, affecting any State law regarding such State regulation, or limiting such State regulation, including any prudence review requirements under such State law;
(4) Modifying the Federal Power Act or affecting the authority of the Federal Energy Regulatory Commission under the Federal Power Act; or,
(5) Interfering with or impairing any program for competitive bidding for power supply in a State in which such program is established.

Certification

I am authorized to make this submission on behalf of the owners and operators of the Acid Rain source or Acid Rain units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name M. L. Gilchrist

Signature

Date 12/8/95

STEP 5 (optional)
Enter the source AIRS and FINDS identification numbers, if known

AIRS

FINDS

United States
Environmental Protection Agency
Acid Rain Program

OMB No 2060-022
Expires 6-30-3

EPA

Certificate of Representation

Page

For more information, see instructions and refer to 40 CFR 72.24

This submission is: ☐ New ☒ Revised

STEP 1
Identify the source by plant name, State, and ORIS code from NADB

Plant Name Smith Electric Generating Plant
State FL
ORIS Code 643

STEP 2
Enter requested information for the designated representative

Name Frederick D. Kuester

Address
2992 West Beach Boulevard
P. O. Box 4079
Gulfport, MS 39502

Phone Number (601) 65-5964
Fax Number (601) 865-5873

STEP 3
Enter requested information for the alternate designated representative (optional)

Name M. L. Gilchrist

Address
Gulf Power Company
P. O. Box 1151
Pensacola, FL 32520-0328

Phone Number (904) 444-6236
Fax Number (904) 444-6705

STEP 4
Complete Step 5, read the certifications and sign and date

I certify that I was selected as the designated representative or alternate designated representative, as applicable, by an agreement binding on the owners and operators of the affected source and each affected unit at the source.

I certify that I have given notice of the agreement, selecting me as the designated representative or alternate designated representative, as applicable for the affected source and each affected unit at the source identified in this certificate of representation, daily for a period of one week in a newspaper of general circulation in the area where the source is located or in a State publication designed to give general public notice.

I certify that I have all necessary authority to carry out my duties and responsibilities under the Acid Rain Program on behalf of the owners and operators of the affected source and of each affected unit at the sour
and that each such owner and operator shall be fully bound by my actions, inactions, or submissions.

I certify that I shall abide by any fiduciary responsibilities imposed by the agreement by which I was selecte
as designated representative or alternate designated representative, as applicable.

I certify that the owners and operators of the affected source and of each affected unit at the source shall
bound by any order issued to me by the Administrator, the permitting authority, or a court regarding the source or unit.

Where there are multiple holders of a legal or equitable title to, or a leasehold interest in, an affected unit. o
where a utility or industrial customer purchases power from an affected unit under life-of-the-unit, firm pow
contractual arrangements, I certify that:

> I have given a written notice of my selection as the designated representative or alternate designated representative, as applicable, and of the agreement by which I was selected to each owner and operator of the affected source and of each affected unit at the source; and
>
> Allowances and the proceeds of transactions involving allowances will be deemed to be held or distributed in proportion to each holder's legal, equitable, leasehold, or contractual reservation or entitlement or, if such multiple holders have expressly provided for a different distribution of allowances
> contract, that allowances and the proceeds of transactions involving allowances will be deemed to be he
> or distributed in accordance with the contract.

The agreement by which I was selected as the alternate designated representative includes a procedure for the owners and operators of the source and affected units at the source to authorize the alternate designat
representative to act in lieu of the designated representative.

BEST AVAILABLE COPY

Certificate · Page

Page 2 of

Smith Electric Generating Plant
Plant Name (from Step 1)

Certification

I am authorized to make this submission on behalf of the owners and operators of the affected source or affected units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonmen

Signature (designated representative)	Date 12/21/94
Signature (alternate)	Date 12/21/94

STEP 5
Provide the name of every owner and operator of the source and each affected unit at the source. Identify the units they own and/or operate by boiler ID# from NADB. For owners only, identify each state or local utility regulatory authority with jurisdiction over each owner

Name Gulf Power Company ☒ Owner ☒ Operator

ID# 1	ID# 2	ID#	ID#	ID#	ID#	ID#
ID#	ID#	ID#	ID#	ID#	ID#	ID#

Regulatory Authorities Florida Public Service Commission

Name ☐ Owner ☐ Operator

ID#	ID#	ID#	ID#	ID#	ID#	ID#
ID#	ID#	ID#	ID#	ID#	ID#	ID#

Regulatory Authorities

Name ☐ Owner ☐ Operator

ID#	ID#	ID#	ID#	ID#	ID#	ID#
ID#	ID#	ID#	ID#	ID#	ID#	ID#

Regulatory Authorities

Name ☐ Owner

ID#	ID#	ID#	ID#	ID#	ID#	ID#
ID#	ID#	ID#	ID#	ID#	ID#	ID#