Check Sheet

Company Name: JACKSONVILLE ELECTRIC AUTHORITY
Permit Number: General
PSD Number:
Permit Engineer:

Application:

- ☐ Initial Application
  - ☐ Incompleteness Letters
  - ☐ Responses
  - ☐ Waiver of Department Action
  - ☐ Department Response
  - ☐ Other

Cross References:

- ☐ AO 16-78586
- ☐ 48311
- ☐

Intent:

- ☐ Intent to Issue
- ☐ Notice of Intent to Issue
- ☐ Technical Evaluation
- ☐ BACT Determination
- ☐ Unsigned Permit
- Correspondence with:
  - ☐ EPA
  - ☐ Park Services
  - ☐ Other
- ☐ Proof of Publication
  - ☐ Petitions - (Related to extensions, hearings, etc.)
  - ☐ Waiver of Department Action
  - ☐ Other

Final Determination:

- ☐ Final Determination
- ☐ Signed Permit
- ☐ BACT Determination
  - ☐ Other

Post Permit Correspondence:

- ☐ Extensions/Amendments/Modifications
- ☐ Other

In the folder labeled as follows there are documents, listed below, which were not reproduced in this electronic file. That folder can be found in one of the file drawers labeled Supplementary Documents Drawer. Folders in that drawer are arranged alphabetically, then by permit number.

Folder Name: Jacksonville Electric Authority

Permit(s) Numbered:

General

Period during which document was received:		Detailed Description
	1.	NETWORK 90 BROCHURE FROM BAILEY CONTROLS

Jim Pennington
M.S. 5505

st. johns river POWER PARK

SJRO LC 95 580

RECEIVED
JAN 03 1996
BUREAU OF
AIR REGULATION

December 29, 1995

Mr. Ernest Frey
District Manager
Florida Dept. of Environmental Protection
7825 Baymeadows Way, Suite 200B
Jacksonville, FL 32256-7577

DEPARTMENT OF
ENVIRONMENTAL PROTECTION
JAN 2 1996
SITING COORDINATION

RE: St. Johns River Power Park Units 1 & 2 (SJRPP)
1995 Annual Air Emissions Performance Test

Dear Mr. Frey:

In accordance with SJRPP's Condition of Certification I.C.5., please find enclosed the report of the annual stationary source performance test and visible emissions observations for the above referenced facility. The testing was performed in November, 1995, by Total Source Analysis, Inc., for stack particulates, sulfur dioxide (SO_2), nitrogen oxides (NO_x), and visible emissions. In addition, visible emission observations were conducted for SJRPP's limestone and flyash handling systems, limestone day silos and flyash silos. Mr. Mike Dunbar of your office was contacted on December 21, 1995 to request submittal of the report the week of December 25, 1995.

Please contact Jay Worley at (904)751-7729 if you have any questions regarding the annual performance test submittal.

Very truly yours,

Richard Breitmoser, P.E.
Vice President
Environmental, Health & Safety

RB/JW/sj

xc: W. Smith (EPA)
H. Oven (FDEP)
W. Tutt (RESD)

FINAL
COMPLIANCE TEST REPORT
FOR
JACKSONVILLE ELECTRIC
AT
S.J.R.P.P.
UNITS 1 & 2

October 31 - November 7, 1995

95-420-FL

TOTAL SOURCE ANALYSIS, INC.

TOTAL SOURCE ANALYSIS, INC.
ENVIRONMENTAL TESTING CONSULTANTS

November 8, 1995

I, James Tayfel, hereby certify that the emissions tests conducted at the St. Johns River Power Park for Jacksonville Electric Authority was in accordance with procedures established by the USEPA. This report accurately and faithfully presents the data obtained from the tests and the results determined from analysis of this data.

James Tayfel
Crew Chief

I, Carl Vineyard, P.E., hereby attest that all work on this project was completed under my supervision and this report accurately presents the emissions from the unit.

Carl Vineyard, P.E.
Chief Test Engineer

I, Angel Aguiar, P.E., have reviewed the reports for completeness and accuracy.

11/17/95

Angel Aguiar, P.E.
Florida Professional Engineer

510 Dickson • P.O. Box 257 • Wellington, OH 44090 • (216) 647-4444 • Fax (216) 647-5288
599 James Rollo Ct. • P.O. Box 272 • Grain Valley, MO 64029 • (816) 224-6905 • Fax (816) 443-2515
810 Central Ave. • P.O. Box 1170 • Umatilla, FL 32784 • (904) 669-3113 • Fax (904) 669-1965

TABLE OF CONTENTS

INTRODUCTION

INTRODUCTION

This report presents the results of the emissions tests performed on Units 1 and 2 at St. Johns River Power Park for Jacksonville Electric Authority.

The purpose of the tests was to determine the emissions of the units for compliance. The results of the tests can be found in Section II of this report.

The emissions testing was performed by Total Source Analysis, Inc., whose Florida Branch Office is located at 810 N. Central Avenue, Umatilla, Florida 32784.

The tests were performed on November 6-7, 1995. The testing was performed in accordance with the Environmental Protection Agency's Reference methods, as published in the July 1, 1994 Federal Register, - "Standards of Performance for New Stationary Sources", and subsequent revisions.

The testing equipment and sampling procedures are described in Section III of this report. The raw field data and equations used in determining final results are presented in the Appendix as well as the calibration data sheets for the applicable testing equipment. The calculated heat input is presented on the page following.

SUMMARY OF TEST RESULTS

SUMMARY OF TEST RESULTS

The following tables present the final results of the annual compliance tests performed at St. Johns River Power Park, Units 1 & 2, for Jacksonville Electric Authority on November 6-7, 1995.

PARTICULATE

Run No.	Test Date	Location	lbs/hr	lbs/dscf	lbs/MBtu
1	11-07-95	Unit 1	85.67	9.98E-07	0.014
* 2	11-07-95	Unit 1	73.87	8.68E-07	0.012
3	11-07-95	Unit 1	80.62	9.47E-07	0.013
Avg.			**80.05**	**9.37E-07**	**0.013**

Run No.	Test Date	Location	lbs/hr	lbs/dscf	lbs/MBtu
1	11-06-95	Unit 2	55.03	6.43E-07	0.009
* 2	11-06-95	Unit 2	57.15	6.71E-07	0.009
3	11-06-95	Unit 2	50.12	5.98E-07	0.008
Avg.			**54.10**	**6.37E-07**	**0.009**

*NOTE: Run #2 for Unit 1 and Unit 2 were soot-blowing runs.

VISIBLE EMISSIONS TEST RESULTS

DATE	LOCATION	% OPACITY
11-06-95	Ash Silo, Unit 1	0.00%
11-06-95	Ash Silo, Unit 2	0.00%
11-06-95	Ash Silo Combined Units 1 & 2	0.00%
11-06-95	Unit #1 Stack, Soot-Blowing Run	0.19%
11-06-95	Unit #2 Stack, Soot-Blowing Run	4.67%
11-07-95	Limestone Silos Unit 1 & 2 Stacks	0.00%
11-07-95	Limestone Handling Area	1.23%

JACKSONVILLE ELECTRIC AUTHORITY
ST. JOHNS RIVER POWER PARK
UNIT 1 STACK
NOVEMBER 6, 1995

$NO_x/CO_2/SO_2$ EMISSIONS

RUN #	DATE	LOCATION	CO2%	NOX PPMS	NOX LBS/MBTU	SO2 PPMS	SO2 LBS/MBTU
1	11-07-95	UNIT 1	12.19	342.44	.604	132.03	.324
	11-07-95	UNIT 1	12.21	344.79	.602	133.23	.326
	11-07-95	UNIT 1	11.57	323.15	.600	126.53	.327
Avg.			**11.99**	**335.79**	**.602**	**130.60**	**.326**
2	11-07-95	UNIT 1	11.60	321.46	.596	121.70	.314
	11-07-95	UNIT 1	12.44	355.64	.614	132.17	.317
	11-07-95	UNIT 1	12.44	347.92	.601	132.79	.319
Avg.			**12.16**	**341.67**	**.604**	**128.89**	**.317**
3	11-07-95	UNIT 1	12.19	339.62	.599	129.43	.317
	11-07-95	UNIT 1	12.27	328.84	.576	146.78	.357
	11-07-95	UNIT 1	11.90	319.56	.577	121.09	.304
Avg.			**12.12**	**329.34**	**.584**	**132.43**	**.326**

NOTE: Each group of three 21 (twenty one) minute runs constitutes a one hour NO_x and/or SO_2 emissions test.

Total NO_x Emissions Average.....................335.60 ppms
Total NO_x Emissions Average..................... 0.597 lb/mbtu

Total SO_2 Emissions Average.....................130.64 ppms
Total SO_2 Emissions Average..................... 0.323 lb/mbtu

JACKSONVILLE ELECTRIC AUTHORITY
ST. JOHNS RIVER POWER PARK
UNIT 2 STACK
NOVEMBER 6, 1995

$NO_x/CO_2/SO_2$ EMISSIONS

RUN #	DATE	LOCATION	CO2%	NOX PPMS	NOX LBS/MBTU	SO2 PPMS	SO2 LBS/MBTU
1	11-06-95	UNIT 2	12.39	342.55	.594	229.24	.553
	11-06-95	UNIT 2	12.38	372.14	.646	231.68	.559
	11-06-95	UNIT 2	12.23	361.29	.635	232.92	.569
Avg.			**12.33**	**358.66**	**.625**	**231.28**	**.560**
2	11-06-95	UNIT 2	12.25	364.73	.640	230.28	.562
	11-06-95	UNIT 2	12.00	363.08	.650	228.49	.569
	11-06-95	UNIT 2	12.02	364.19	.651	232.41	.578
Avg.			**12.09**	**364.00**	**.647**	**230.39**	**.570**
3	11-06-95	UNIT 2	11.82	347.33	.632	215.83	.546
	11-06-95	UNIT 2	11.82	344.12	.626	217.97	.551
	11-06-95	UNIT 2	11.71	339.02	.622	213.23	.544
Avg.			**11.78**	**343.49**	**.627**	**215.68**	**.547**

NOTE: Each group of three 21 (twenty one) minute runs constitutes a one hour NO_x and/or SO_2 emissions test.

Total NO_x Emissions Average.....................355.38 ppms
Total NO_x Emissions Average..................... 0.633 lb/mbtu

Total SO_2 Emissions Average.....................225.78 ppms
Total SO_2 Emissions Average..................... 0.559 lb/mbtu

The complete results can be found on the computer printouts on the following pages and in the Intermediate Calculations section.

Total Source Analysis, Inc.
Particulate Test Analysis

JEA SJRPP
JACKSONVILLE FLORIDA

95-420
COMPLIANCE

Run Number		1	2	3
Data set		(01)	(02)	(03)
Date		11/6/95	11/6/95	11/6/95
Location		UNIT 1 ST RM-5B	UNIT 1 ST RM-5B	UNIT 1 ST RM-5B
Start time		09:25	11:55	14:20
End time		11:28	14:00	16:26
Barometric Pressure	In. Hg	29.95	29.95	29.95
Static Pressure	In. H2O	-0.50	-0.50	-0.50
Volume of Condensate	Mls	175	187	180
Volume Sampled	DCF	70.577	71.142	69.954
Meter Correction Factor		0.96	0.96	0.96
Square Root of Delta P		1.102	1.105	1.109
Orifice Pressure	In. H2O	1.01	1.02	1.01
Meter Temperature	Deg. F	102	103	102
Flue Temperature	Deg. F	150	156	163
Percent CO2	%	12.80	13.20	13.20
Percent O2	%	6.20	6.00	6.20
Diameter of Nozzle	In	0.180	0.180	0.180
Area of Flue	Sq Ft	471.43	471.43	471.43
Sample Time	Min	120	120	120
Weight Gain	Grams	0.0289	0.0253	0.0272
F Factor	DSCF/MBtu	9780	9780	9780
Absolute Flue Pressure	In. Hg	29.91	29.91	29.91
Corrected Sample Volume	DSCF	63.85	64.25	63.29
Moisture in Flue Gas	%	11.4	12.1	11.8
Molecular Weight	Lb/LbMole	28.89	28.86	28.90
Velocity of Flue Gas	FpS	66.01	66.55	67.13
Volume of Flue Gas	ACFM	1,867,133	1,882,340	1,898,736
Volume of Flue Gas	DSCFM	1,430,717	1,418,084	1,417,885
Dust Concentration	Lb/DSCF	9.98E-07	8.68E-07	9.47E-07
Dust Concentration	Lbs/Hour	85.67	73.87	80.62
Dust Concentration	Grs/ACF	5.45E-03	4.69E-03	5.08E-03
Dust Concentration	Grs/DSCF	6.98E-03	6.07E-03	6.63E-03
Isokinetic Rate	%	99.1	100.6	99.1
Particulate Emissions	Lb/MBtu	0.014	0.012	0.013

Averages:

Stack Temperature		156.3	Percent O2	6.1
Vol Flue Gas	ACFM	1,882,736	DSCFM	1,422,229
Part Emis	Lb/DSCF	9.37E-07	Lb/Hour	80.05
	Grs/ACF	5.08E-03	Grs/DSCF	6.57E-03
	Lbs/MBtu	1.3E-02		

Total Source Analysis, Inc.
Particulate Test Analysis

JEA SJRPP
JACKSONVILLE FLORIDA

95-420
COMPLIANCE

Run Number		1	2	3
Data set		(04)	(05)	(06)
Date		11/7/95	11/7/95	11/7/95
Location		UNIT 2 ST RM-5B	UNIT 2 ST RM-5B	UNIT 2 ST RM-5B
Start time		08:00	11:00	13:25
End time		10:04	13:05	15:30
Barometric Pressure	In. Hg	29.74	29.74	29.74
Static Pressure	In. H2O	-0.68	-0.68	-0.68
Volume of Condensate	Mls	167	186	197
Volume Sampled	DCF	70.439	70.177	69.673
Meter Correction Factor		0.96	0.96	0.96
Square Root of Delta P		1.102	1.109	1.102
Orifice Pressure	In. H2O	0.98	1.00	0.98
Meter Temperature	Deg. F	101	96	92
Flue Temperature	Deg. F	155	155	161
Percent CO2	%	12.60	13.00	12.90
Percent O2	%	6.40	6.20	6.20
Diameter of Nozzle	In	0.180	0.180	0.180
Area of Flue	Sq Ft	471.43	471.43	471.43
Sample Time	Min	120	120	120
Weight Gain	Grams	0.0185	0.0194	0.0173
F Factor	DSCF/MBtu	9780	9780	9780
Absolute Flue Pressure	In. Hg	29.69	29.69	29.69
Corrected Sample Volume	DSCF	63.39	63.72	63.72
Moisture in Flue Gas	%	11.0	12.1	12.7
Molecular Weight	Lb/LbMole	28.92	28.84	28.75
Velocity of Flue Gas	FpS	66.50	67.02	67.02
Volume of Flue Gas	ACFM	1,880,878	1,895,584	1,895,727
Volume of Flue Gas	DSCFM	1,425,357	1,418,960	1,395,572
Dust Concentration	Lb/DSCF	6.43E-07	6.71E-07	5.98E-07
Dust Concentration	Lbs/Hour	55.03	57.15	50.12
Dust Concentration	Grs/ACF	3.48E-03	3.57E-03	3.12E-03
Dust Concentration	Grs/DSCF	4.50E-03	4.69E-03	4.19E-03
Isokinetic Rate	%	98.7	99.7	101.4
Particulate Emissions	Lb/MBtu	0.009	0.009	0.008

Averages:

Stack Temperature		157.0	Percent O2	6.3
Vol Flue Gas	ACFM	1,890,730	DSCFM	1,413,296
Part Emis	Lb/DSCF	6.37E-07	Lb/Hour	54.10
	Grs/ACF	3.4E-03	Grs/DSCF	4.46E-03
	Lbs/MBtu	8.67E-03		

INTERMEDIATE CALCULATIONS

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: NOX
MONITOR SPAN 1000

JEA/SJRPP
95-420-FL

UNIT NO.: UNIT #1 - STACK

RUN NUMBE	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GA BIAS	FINAL UPSCALE GA BIAS	UPSCALE GA DRIFT	CALIBRATION GAS PPM	PERCENT MOISTURE	CORRECTED PPM, DRY BASIS	CORRECTED PPM, WET BASIS
1	375.60	4.50	4.50	0.00	423.70	427.10	0.34	457.00	15.01%	402.93	342.44
2	376.32	4.50	4.00	-0.05	427.10	427.00	-0.01	457.00	15.01%	402.17	341.79
3	374.22	4.00	5.40	0.14	427.00	426.00	-0.10	457.00	19.28%	400.36	323.15
4	372.19	5.40	5.20	-0.02	426.00	426.60	0.06	457.00	19.28%	398.26	321.46
5	388.13	5.20	5.40	0.02	426.60	435.00	0.84	457.00	13.50%	411.17	355.64
6	387.06	5.40	5.60	0.02	435.00	443.00	0.80	457.00	13.50%	402.24	347.92
7	383.03	5.60	5.40	-0.02	443.00	432.00	-1.10	457.00	14.96%	399.38	339.62
8	370.68	5.40	6.30	0.09	432.00	442.00	1.00	457.00	14.96%	386.70	328.84
9	374.04	6.30	6.50	0.02	442.00	439.50	-0.25	457.00	17.39%	386.81	319.56
10	370.53	6.50	6.50	0.00	439.50	432.00	-0.75	457.00	17.39%	387.56	320.18
11	361.36	6.50	6.30	-0.02	432.00	425.00	-0.70	457.00	17.39%	384.31	317.49
12	0.00	6.30	0.00	-0.63	425.00	0.00	-42.50	457.00	ERR	-6.88	ERR

C1

Cgas = (Cavg - Co) * Cma / (Cm - Co)   Eq. 6C-1

where:
Cgas = Effluent gas concentration, dry basis, ppm
Cavg = Average gas concentration indicated by gas analyzer, dry basis, ppm
Co = Average of initial and final system calibration bias check responses for the zero gas, ppm
Cm = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
Cma = Actual concentration of the upscale calibration gas, ppm

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO_2
MONITOR SPAN 20

JEA/SJRPP
95-420-FL

UNIT NO.: UNIT #1 - STACK

RUN NUMBER	AVERAGE MEASURED PERCENT	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GA BIAS	FINAL UPSCALE GA BIAS	UPSCALE GA DRIFT	CALIBRATION GAS PERCENT	PERCENT MOISTURE	CORRECTED PERCENT, DRY BASIS	CORRECTED PERCENT, WET BASIS
1	13.89%	0.10%	0.20%	0.50%	10.50%	10.50%	0.00%	10.80%	15.01%	14.34%	12.19%
2	13.90%	0.20%	0.20%	0.00%	10.50%	10.50%	0.00%	10.80%	15.01%	14.37%	12.21%
3	13.87%	0.20%	0.20%	0.00%	10.50%	10.50%	0.00%	10.80%	19.28%	14.33%	11.57%
4	13.90%	0.20%	0.20%	0.00%	10.50%	10.50%	0.00%	10.80%	19.28%	14.37%	11.59%
5	13.92%	0.20%	0.20%	0.00%	10.50%	10.50%	0.00%	10.80%	13.50%	14.39%	12.44%
6	13.92%	0.20%	0.20%	0.00%	10.50%	10.50%	0.00%	10.80%	13.50%	14.39%	12.44%
7	13.87%	0.20%	0.20%	0.00%	10.50%	10.50%	0.00%	10.80%	14.96%	14.33%	12.19%
8	13.96%	0.20%	0.20%	0.00%	10.50%	10.50%	0.00%	10.80%	14.96%	14.43%	12.27%
9	13.94%	0.20%	0.20%	0.00%	10.50%	10.50%	0.00%	10.80%	17.39%	14.41%	11.90%
10	13.84%	0.20%	0.20%	0.00%	10.50%	10.50%	0.00%	10.80%	17.39%	14.30%	11.82%
11	13.86%	0.20%	0.20%	0.00%	10.50%	10.50%	0.00%	10.80%	17.39%	14.32%	11.83%
12	0.00%	0.20%	0.00%	-1.00%	10.50%	0.00%	-52.50%	10.80%	ERR	-0.21%	ERR

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \qquad \text{EQ. 6C-1}$$

where:

C_{gas} = Effluent gas concentration, dry basis, ppm
C_{avg} = Average gas concentration indicated by gas analyzer, dry basis, ppm
C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm
C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
C_{ma} = Actual concentration of the upscale calibration gas, ppm

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: SO2
MONITOR SPAN 300

JEA/SJRPP
95-420-FL

UNIT NO.: UNIT #1 - STACK

RUN NUMBE	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GA BIAS	FINAL UPSCALE GA BIAS	UPSCALE GA DRIFT	CALIBRATION GAS PPM	PERCENT MOISTURE	CORRECTED PPM, DRY BASIS	CORRECTED PPM, WET BASIS
1	156.93	2.10	10.00	2.63	220.00	217.50	-0.83	219.00	15.01%	155.35	132.03
2	158.84	10.00	12.20	0.73	217.50	217.50	0.00	219.00	15.01%	156.76	133.23
3	158.43	12.20	12.40	0.07	217.50	215.40	-0.70	219.00	19.28%	156.76	126.53
4	151.89	12.40	12.00	-0.13	215.40	214.80	-0.20	219.00	19.28%	150.77	121.70
5	153.47	12.00	11.30	-0.23	214.80	215.00	0.07	219.00	13.50%	152.81	132.17
6	152.33	11.30	11.20	-0.03	215.00	210.00	-1.67	219.00	13.50%	153.52	132.79
7	148.99	11.20	11.00	-0.07	210.00	209.00	-0.33	219.00	14.96%	152.21	129.43
8	166.92	11.00	11.20	0.07	209.00	208.60	-0.13	219.00	14.96%	172.61	146.78
9	143.68	11.20	11.80	0.20	208.60	209.40	0.27	219.00	17.39%	146.57	121.09
10	142.72	11.80	11.40	-0.13	209.40	210.20	0.27	219.00	17.39%	144.88	119.69
11	139.47	11.40	11.20	-0.07	210.20	207.30	-0.97	219.00	17.39%	142.16	117.44
12	0.00	11.20	0.00	-3.73	207.30	0.00	-69.10	219.00	ERR	-12.51	ERR

C3

Cgas = (Cavg - Co) * Cma / (Cm - Co)   Eq. 6C-1

where:
Cgas = Effluent gas concentration, dry basis, ppm
Cavg = Average gas concentration indicated by gas analyzer, dry basis, ppm
Co = Average of initial and final system calibration bias check responses for the zero gas, ppm
Cm = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
Cma = Actual concentration of the upscale calibration gas, ppm

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: NOX
MONITOR SPAN 1000

JEA/SJRPP
95-420-FL

UNIT NO.: TWO

RUN NUMBE	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GA BIAS	FINAL UPSCALE GA BIAS	UPSCALE GA DRIFT	CALIBRATION GAS PPM	PERCENT MOISTURE	CORRECTED PPM, DRY BASIS	CORRECTED PPM, WET BASIS
1	361.37	4.40	5.40	0.10	429.50	420.20	-0.93	457.00	11.70%	387.92	342.55
2	390.68	5.40	5.50	0.01	420.20	426.20	0.60	457.00	11.70%	421.42	372.14
3	386.49	5.50	5.00	-0.05	426.20	426.01	-0.02	457.00	12.73%	413.98	361.29
4	388.12	5.00	4.80	-0.02	426.01	421.90	-0.41	457.00	12.73%	417.92	364.73
5	390.17	4.80	5.40	0.06	421.90	422.40	0.05	457.00	13.95%	421.96	363.08
6	390.96	5.40	5.55	0.01	422.40	421.00	-0.14	457.00	13.95%	423.25	364.19
7	377.59	5.55	5.90	0.04	421.00	422.80	0.18	457.00	14.94%	408.34	347.33
8	375.01	5.90	5.90	0.00	422.80	422.90	0.01	457.00	14.94%	404.56	344.12
9	375.78	5.90	8.20	0.23	422.90	422.90	0.00	457.00	16.34%	405.22	339.02
10	376.81	8.20	6.33	-0.19	422.90	422.00	-0.09	457.00	16.34%	406.76	340.32
11	0.00	6.33	0.00	-0.63	422.00	0.00	-42.20	457.00	ERR	-6.96	ERR
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	457.00	ERR	ERR	ERR

$$Cgas = (Cavg - Co) * Cma / (Cm - Co) \qquad \text{Eq. 6C-1}$$

where:

Cgas = Effluent gas concentration, dry basis, ppm
Cavg = Average gas concentration indicated by gas analyzer, dry basis, ppm
Co = Average of initial and final system calibration bias check responses for the zero gas, ppm
Cm = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
Cma = Actual concentration of the upscale calibration gas, ppm

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: CO_2 | JEA/SJRPP
MONITOR SPAN 20 | 95-420-FL | UNIT NO.: TWO

RUN NUMBER	AVERAGE MEASURED PERCENT	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GA BIAS	FINAL UPSCALE GA BIAS	UPSCALE GA DRIFT	CALIBRATION GAS PERCENT	PERCENT MOISTURE	CORRECTED PERCENT, DRY BASIS	CORRECTED PERCENT, WET BASIS
1	13.70%	0.30%	0.20%	-0.50%	10.60%	10.60%	0.00%	10.80%	11.70%	14.03%	12.39%
2	13.70%	0.20%	0.20%	0.00%	10.60%	10.60%	0.00%	10.80%	11.70%	14.02%	12.38%
3	13.69%	0.20%	0.20%	0.00%	10.60%	10.60%	0.00%	10.80%	12.73%	14.01%	12.23%
4	13.72%	0.20%	0.20%	0.00%	10.60%	10.60%	0.00%	10.80%	12.73%	14.04%	12.25%
5	13.63%	0.20%	0.20%	0.00%	10.60%	10.60%	0.00%	10.80%	13.95%	13.95%	12.00%
6	13.65%	0.20%	0.20%	0.00%	10.60%	10.60%	0.00%	10.80%	13.95%	13.97%	12.02%
7	13.58%	0.20%	0.20%	0.00%	10.60%	10.60%	0.00%	10.80%	14.94%	13.89%	11.82%
8	13.57%	0.20%	0.30%	0.50%	10.60%	10.60%	0.00%	10.80%	14.94%	13.90%	11.82%
9	13.65%	0.30%	0.30%	0.00%	10.60%	10.60%	0.00%	10.80%	16.34%	14.00%	11.71%
10	13.68%	0.30%	0.30%	0.00%	10.60%	10.60%	0.00%	10.80%	16.34%	14.03%	11.74%
11	0.00%	0.30%	0.00%	-1.50%	10.60%	0.00%	-53.00%	10.80%	ERR	-0.31%	ERR
12	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.80%	ERR	ERR	ERR

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \qquad \text{EQ. 6C-1}$$

where:
Cgas = Effluent gas concentration, dry basis, ppm
Cavg = Average gas concentration indicated by gas analyzer, dry basis, ppm
Co = Average of initial and final system calibration bias check responses for the zero gas, ppm
Cm = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
Cma = Actual concentration of the upscale calibration gas, ppm

SAMPLING SYSTEM BIAS CHECK AND MEASURED VALUE CORRECTION

POLLUTANT: SO2
MONITOR SPAN 300

JEA/SJRPP
95-420-FL

UNIT NO.: TWO

RUN NUMBE	AVERAGE MEASURED PPM	INITIAL ZERO GAS BIAS	FINAL ZERO GAS BIAS	ZERO GAS DRIFT	INITIAL UPSCALE GA BIAS	FINAL UPSCALE GA BIAS	UPSCALE GA DRIFT	CALIBRATION GAS PPM	PERCENT MOISTURE	CORRECTED PPM, DRY BASIS	CORRECTED PPM, WET BASIS
1	247.34	2.30	4.60	0.77	208.60	209.80	0.40	219.00	11.70%	259.60	229.24
2	249.38	4.60	6.20	0.53	209.80	208.30	-0.50	219.00	11.70%	262.37	231.68
3	252.62	6.20	6.20	0.00	208.30	208.50	0.07	219.00	12.73%	266.89	232.92
4	251.11	6.20	8.30	0.70	208.50	210.80	0.77	219.00	12.73%	263.86	230.28
5	253.92	8.30	7.50	-0.27	210.80	210.80	0.00	219.00	13.95%	265.54	228.49
6	256.76	7.50	8.00	0.17	210.80	208.50	-0.77	219.00	13.95%	270.10	232.41
7	242.32	8.00	8.20	0.07	208.50	212.00	1.17	219.00	14.94%	253.74	215.83
8	245.89	8.20	8.50	0.10	212.00	210.70	-0.43	219.00	14.94%	256.26	217.97
9	248.47	8.50	8.52	0.01	210.70	218.70	2.67	219.00	16.34%	254.87	213.23
10	245.51	8.52	7.90	-0.21	218.70	226.60	2.63	219.00	16.34%	242.35	202.76
11	0.00	7.90	0.00	-2.63	226.60	0.00	-75.53	219.00	ERR	-7.91	ERR
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	219.00	ERR	ERR	ERR

$$C_{gas} = (C_{avg} - C_o) * C_{ma} / (C_m - C_o) \quad \text{Eq. 6C-1}$$

where:

Cgas = Effluent gas concentration, dry basis, ppm
Cavg = Average gas concentration indicated by gas analyzer, dry basis, ppm
Co = Average of initial and final system calibration bias check responses for the zero gas, ppm
Cm = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm
Cma = Actual concentration of the upscale calibration gas, ppm

SAMPLING AND ANALYTICAL PROCEDURES

TESTING EQUIPMENT - EPA METHOD 5B SAMPLING TRAIN

An Anderson Corporation Stack Sampler (Model 201415) was used at the sampling locations(s). The particulate sampling train consisted basically of a glass or stainless steel probe; a variable-heat-controlled filter oven with a calibrated Type K (Chromel/Alumel) thermocouple located at the impinger outlet; a 1/4-hp shaft sealed carbon vane vacuum pump assembly with a vacuum gauge; a control unit with an elapse time indicator, a temperature selector switch, a temperature indicator (potentiometer), temperature controllers, an inclined draft gauge, a calibrated dry gas meter, and a calibrated orifice; and an umbilical with various interconnecting hoses, fitting and valves. An appropriately sized stainless-steel nozzle, a calibrated Type K temperature sensor, a static pressure tube, a calibrated S type pitot tube and a variable-heat-controlled stainless-steel liner with a calibrated Type K (Chromel/Alumel) thermocouple are integral parts of the probe assembly.

The vacuum pump was used to control gas sampling rates. The control unit was used to control probe and oven temperatures. The control unit was also used to monitor elapsed sampling times, temperatures, velocities, static pressure, gas sampling rates and sampled gas volume.

Integrated Gas Sampling Train

Flue gas was collected at the sampling location(s) for analysis with an integrated gas sampling train. The sampling train consisted basically of a Mann-made polystyrene gas filter drying tube; a Thomas 1/20-hp sealed-head diaphragm vacuum pump, and tygon tubing with various interconnecting fittings and valves.

Analyzer (Orsat)

Flue gas concentrations were determined with a Gas Analyzer (Orsat) which measures the percentage of carbon dioxide, the percentage of oxygen and percentage of carbon monoxide to the nearest tenth of a percent.

Programmable Calculator

A Hewlett Packard, Model 32SII, programmable calculator was used to determine the isokinetic sampling rate at each sampling point.

Barometer

The barometric pressure (actual station pressure) was determined from a calibrated Aneroid barometer located near the test site which read directly in inches of mercury to the nearest hundredth of an inch.

SAMPLING PROCEDURES - EPA REFERENCE METHOD 5B (PARTICULATE)

Prior to the field testing, the following procedures were performed: All instruments were checked and calibrated. Gelman Spectro Grade, glass-fiber-mat filters with 99.9 percent retention of 0.3-micron particles were individually numbered, placed in similarly numbered glass petri dishes, oven dried at 320 degrees Fahrenheit for two to three hours, cooled in a desiccator and individually weighed on a Mettler analytical balance (Model H54AR) to the nearest 0.1-milligram, and weighed a minimum of every six hours until two consecutive weights within ±0.5 milligrams were obtained. Several 250 milliliter crucibles were desiccated for a minimum of 24 hours and weighed in the same manner as the filters and petri dishes. Also, several 200-gram quantities of Type 6-16 mesh indicating silica gel were weighed on an Ohaus beam balance and placed into separate airtight polypropylene storage bottles.

The number of sampling points and positions of the points in the flue at the sampling location(s), and the sampling time at each point were determined prior to the particulate testing. The sampling procedures were performed in accordance with the Environment Protection Agency's Reference Method 5B, "Determination of Particulate Emissions from Stationary Sources" in the July 1, 1994 Federal Register, "Standards of Performance for New Stationary Sources" and subsequent revisions.

Before each test run, a particulate sampling train was prepared in part at the sampling location(s) in the following manner: An appropriately sized sampling nozzle was installed onto the inlet of the sampling probe and capped. The probe was then dimensioned and marked with glass-cloth tape at increments that corresponded with the predetermined sampling positions in the flue. A standard impinger assembly was prepared by adding 100 milliliters of distilled water, to each of the first two glass impingers. The third glass impinger was left dry and the fourth was filled with approximately 250 grams of type 6-16 mesh indicating silica gel. The entire impinger assembly was then placed in an ice bath. A disc filter was removed from its petri dish and placed inside a filter holder. The filter holder was then placed inside a filter oven and assembled to the sampling probe outlet and the impinger unit inlet. Next, an umbilical and sampling hoses were connected to the sampling probe, filter oven, impinger unit, vacuum pump and the control unit, accordingly. The probe and oven were then heated to and held at temperatures between 300 and 340 degrees Fahrenheit. The inclined draft gauges were checked and zeroed.

As soon as the probe and oven temperatures had stabilized the entire sampling train assembly was leak-checked at a minimum of 15 inches of mercury vacuum for one minute and the leakage rate recorded. A leakage rate of less than .02 cfm and no vacuum loss was considered acceptable.

After the particulate sampling train had been assembled, as previously described, the particulate sampling was performed.

The sampling nozzle, probe and filter holder were washed with nanograde acetone. The acetone washing and acetone blank were collected in labeled polypropylene sample bottles and retained for later evaporation, desiccation and weighing.

Flue gas concentrations (percentage of CO_2, percentage of O_2, and percentage of CO) were determined by taking several orsat samples of the gas collected, simultaneously with the particulate sampling throughout the test run, by an integrated gas sampling train. The integrated gas sample was collected from the discharge of the particulate control unit. The sampling train was set at a predetermined constant flow rate to obtain an adequate sample. The concentrations for each test run were recorded on a field test form.

Prior to the particulate sampling, a preliminary temperature and velocity traverse, orsat analysis and calculations were performed to determine a correct nozzle and orifice size, and the factors that would be used in calculating the isokinetic sampling rate for each sampling point. Knowing the actual pressure differential across the pitot tube used, the isokinetic sampling rate was calculated at each sampling point using a Hewlett Packard, Model 32SII, Programmable Calculator.

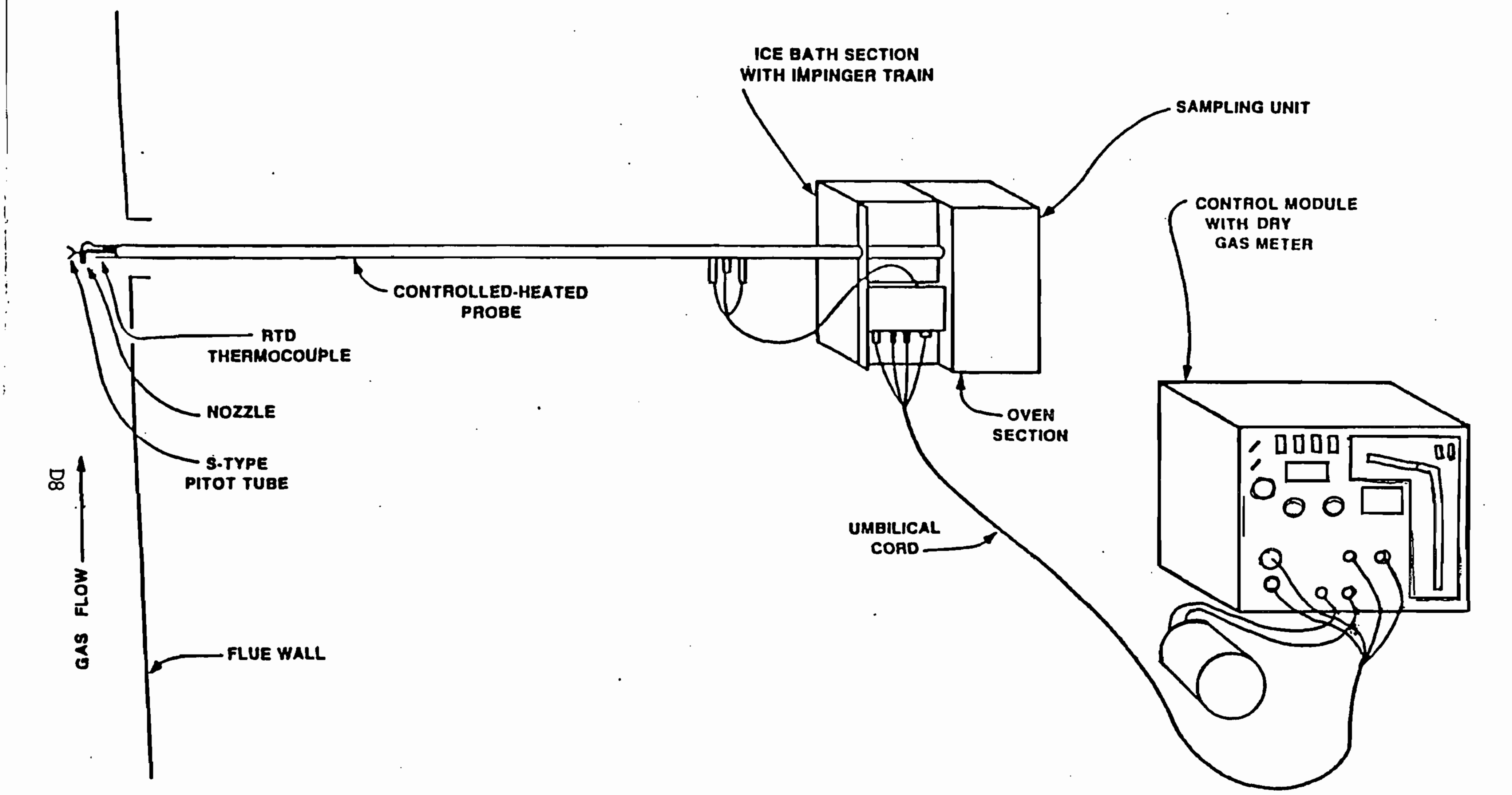
Three test runs were performed at the sampling location(s). The sampling data for each test run was recorded on a field test form during each of the sampling periods.

After the completion of a test run, the following procedures were performed: A final leak-check was performed at highest vacuum during the test for one minute and the leakage rate recorded. The flue gas moisture collected in the first three impingers was measured and recorded. The moisture laden silica gel in the fourth impinger was transferred to an appropriately marked, airtight polypropylene bottle and retained for later weighing. The weight gain of the silica gel moisture collection was added to the measured moisture condensed for that test run. The sample nozzle, probe and filter holder were capped and taken to a clean area for sample recovery. At the recovery area, the disc filter was carefully removed from the filter holder and transferred to its petri dish for later weighing.

ANALYTICAL PROCEDURES - EPA REFERENCE METHOD 5B (PARTICULATE)

After the field testing was completed, the following procedures were performed: Each silica gel moisture collection was weighed in its storage bottle on an Ohaus beam balance with sensitivity of 0.1-gram. Each disc filter and petri dish was oven dried at 320 degrees Fahrenheit for six hours and cooled in a desiccator for two hours before weighing. Each acetone washing and acetone blank was transferred from its sample bottle to a preweighed crucible for evaporation. When the acetone in a crucible had completely evaporated, it was oven dried at 320 degrees Fahrenheit for six hours and transferred to a desiccator for further drying at room temperature. Each acetone blank collected was used to determine the amount of residual weight each crucible retained due to acetone impurities. Each disc filter and petri dish, acetone washing and acetone blank was weighed on a Mettler analytical balance (Model H54AR) with a sensitivity of 0.1-milligram.

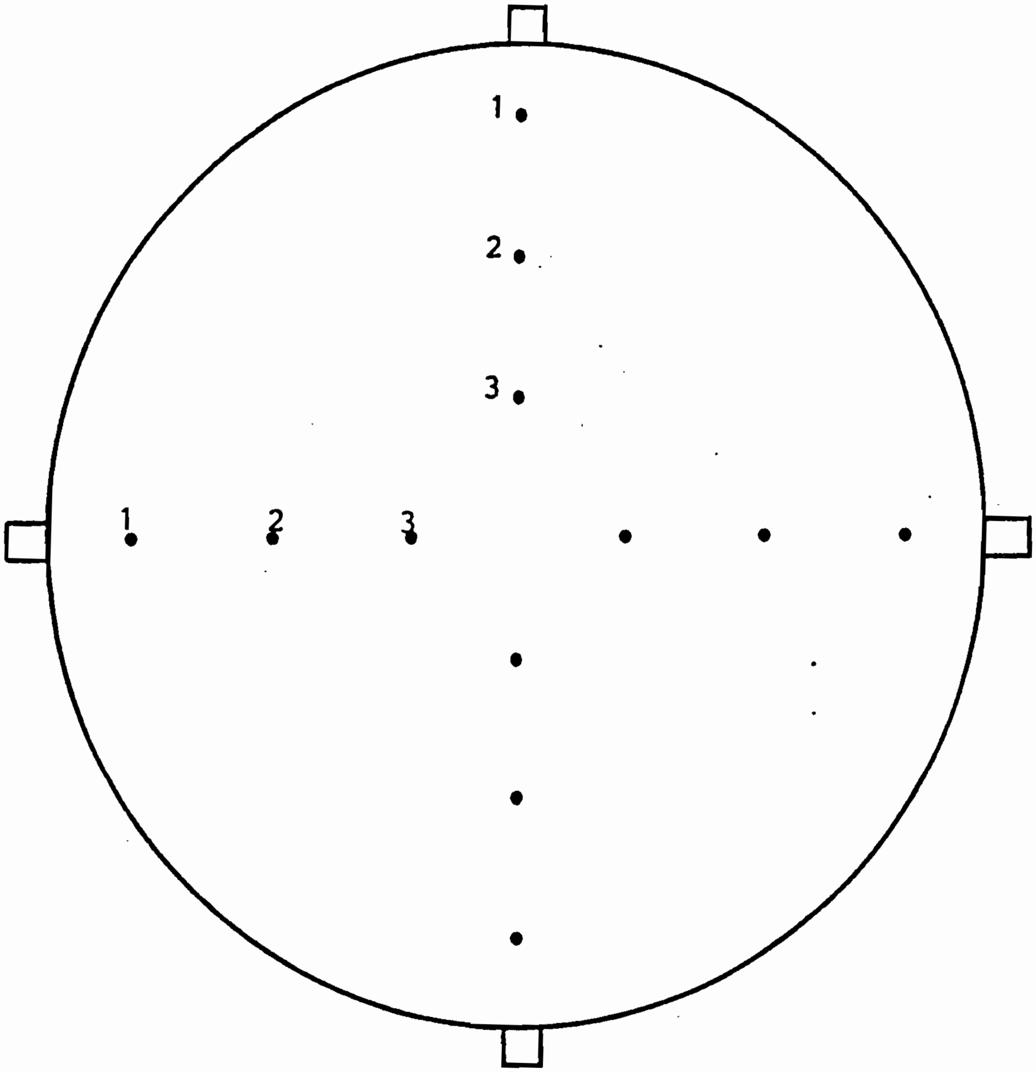
All test instruments were recalibrated to determine the deviation percentage.



Total Source Analysis, Inc.
Environmental Testing Consultants

TYPICAL SAMPLING TRAIN

JEA-SJRPP UNIT 1&2
PARTICULATE SAMPLE POINTS



POINTS	DISTANCE FROM INSIDE WALL
1	12 7/8"
2	3' 6 7/8"
3	7' 3 "

DIAMETER STACK 24' 6"

CROSS SECTION AREA 471.43 FT^2

Port Length = 19"

NOT TO SCALE

D9

Total Source Analysis, Inc.
Environmental Testing Consultants

Exhibit

STACK TEST POINT LOCATIONS

METHOD 9 - VISUAL DETERMINATION OF OPACITY OF EMISSIONS FROM STATIONARY SOURCES

Many stationary sources discharge visible emissions into the atmosphere; these emissions are usually plume shaped. This method involves the determination of plume opacity by our qualified observers. The method includes procedures for training and certification of observers, and procedures used in the field for determination of plume opacity. The appearance of the plume as viewed by an observer depended upon a number of variables, some of which could be controlled and some of which could not be controlled in the field. Variables which could be controlled to an extent to which they no longer exerted a significant influence upon plume appearance included: Angles of the observer with respect to the plume; angle of the observer with respect to the sun; point of observation of attached and detached steam plume; and angle of the observer with respect to the plume emitted from a rectangular stack with a large length to width ratio. The method includes specific criteria applicable to these variables.

Other variables which could not be controlled in the field were luminescence and color contrast between the plume and the background against which the plume was viewed. These variables exerted an influence upon the appearance of the plume as viewed by the observer, and could affect the ability of the observer to accurately assign opacity values to the observed plumes.

The plume is most visible and presents the greatest apparent opacity when viewed against a contrasting background. It follows from this that the opacity of a plume, viewed under conditions where a contrasting background is present, could be assigned with the greatest degree of accuracy. However, the potential for a positive error is also the greatest when a plume is viewed under such contrasting conditions. Under conditions presenting a less contrasting background, the apparent opacity of plume is less and approaches zero as the color and luminescence contrast decrease toward zero. As a result, significant negative bias and negative errors could be made when a plume is viewed under less contrasting conditions. A negative bias decreases rather than increases the possibility that a plant operator will be cited for a violation of opacity standards due to observer error.

PROCEDURES

The observer used the following procedures for visually determining the opacity of emissions:

Position

The qualified observer stood at a distance sufficient to provide a clear view of the emissions with the sun oriented in the 140 degree sector to his back.

Consistent with maintaining the above requirement, the observer made his observations from a position such that his line of vision was approximately perpendicular to the plume direction, and when observing opacity of emissions from rectangular outlets (e.g. roof monitors, open baghouses, noncircular stacks), approximately perpendicular to the longer axis of the outlet. The observer's line of sight did not include more than one plume at a time when multiple stacks were involved, and in any case the observer made his observations with his line of sight perpendicular to the longer axis of such a set of multiple stacks (e.g. stub stacks on baghouses).

Field Records

The observer recorded the name of the plant, emission location, type of facility, observer's name and affiliation, and the date on a field data sheet. The time, estimated distance to the emission location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), and plume background were recorded on a field data sheet at the time opacity readings were initiated and completed.

Observations

Opacity observations were made at the point of greatest opacity in that portion of the plume where condensed water vapor was not present. The observer did not look continuously at the plume, but instead observed the plume momentarily at 15-second intervals.

Attached Steam Plumes

When condensed water vapor was present within the plume as it emerged from the emission outlet, opacity observations were made beyond the point in the plume at which condensed water vapor was no longer visible. The observer recorded the approximate distance from the emissions outlet to the point in the plume at which the observations were made.

Detached Steam Plumes

When water vapor in the plume condensed and became visible at a distinct distance from the emission outlet, the opacity of emissions was evaluated at the emission outlet prior to the condensation of water vapor and the formation of the steam plume.

Recording Observations

Opacity observations were recorded to the nearest 5 percent at 15-second intervals on an observational record sheet. A minimum of 24 observations were recorded. Each momentary observations recorded was deemed to represent the average opacity of emissions for a 15-second period.

Data Reduction

Opacity was determined as an average of 24 consecutive observations recorded at 15-second intervals. The observations recorded on the record sheet were divided into sets of 24 consecutive observations. Sets needed may not be consecutive in time and in no case were two sets overlapped.

Each set of 24 observations was calculated to an average by summing the opacity of the 24 observations and dividing this sum by 24.

Information: This information was taken from the "Code of Federal Regulations", Parts of 53 to 80, Revised edition, July 1, 1993.

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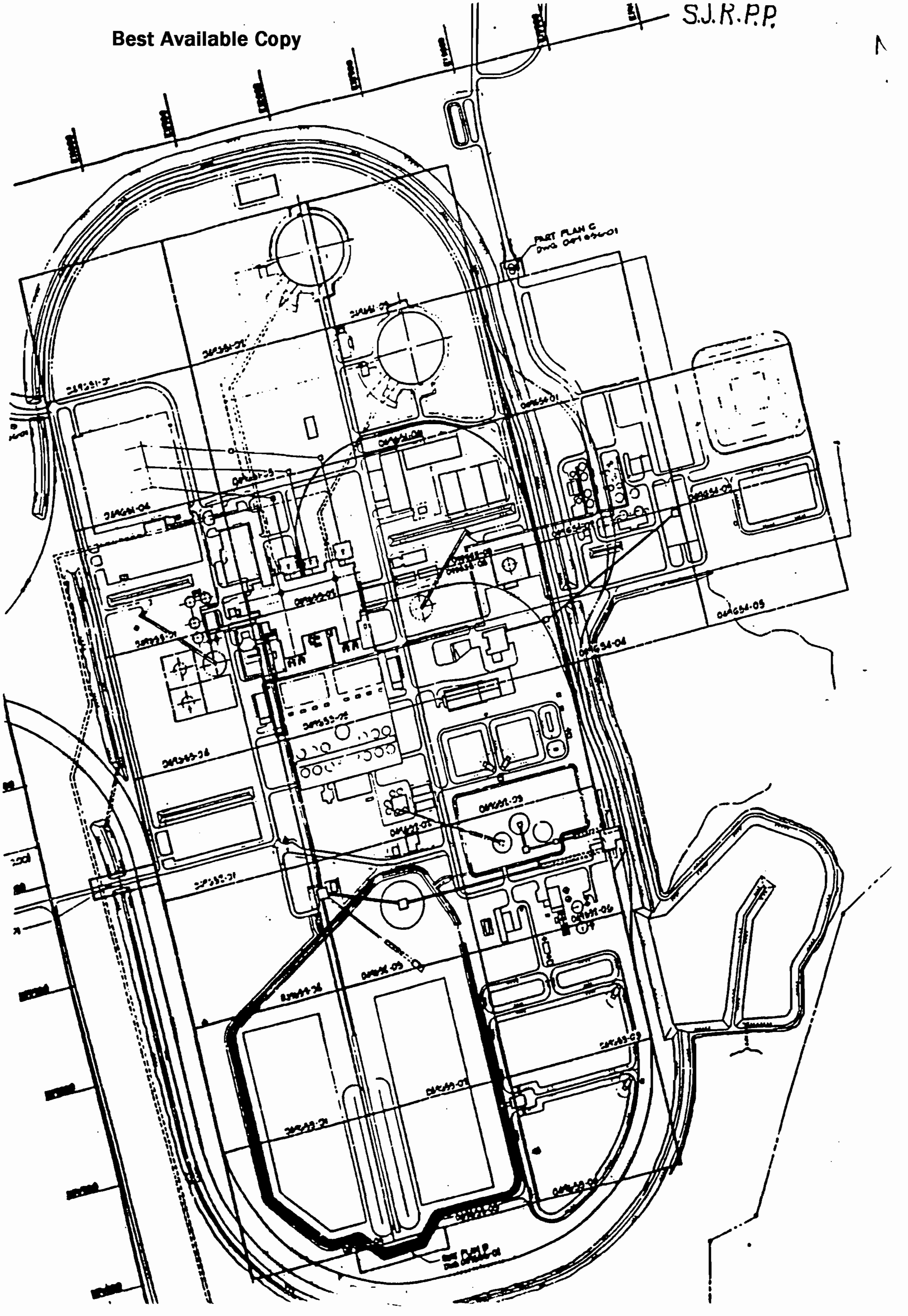


VISIBLE EMISSIONS EVALUATION

This is to certify that

James L. Tayfel

did complete a course in the methods of determining opacity of visible emissions from sources as specified by Federal Reference Method 9 conducted by Eastern Technical Associates of Raleigh, North Carolina.

Joseph Guffey
Course Moderator

West Palm Beach
Location

January 10, 1995
Date

© GOES 445

LITHO.IN U.S.A.

VISIBLE EMISSIONS EVALUATOR

This is to certify that

James Saylor

met the specifications of Federal Reference Method 9 and qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, North Carolina. This certificate is valid for six months from date of issue.

Thomas Rose
President

248967
Certificate Number

Vice President

Jacksonville
Location

David B. Savage, Jr.
Program Manager

June 7, 1995
Date of Issue

TESTING EQUIPMENT EPA TEST METHOD 6C (SO_2)
(Instrumental Analyzer Procedure)
Principle: A gas sample is continuously extracted from a stack, and a portion of the sample is conveyed to an instrumental chemiluminescent analyzer for determination of SO_2 concentration.

1. Sampling Train
   1. A Thermo Environmental Instruments Monitor, Model 43H, Source Monitor together with a Thermo Electron Conditioning System along with a Molytek Strip Chart Recorder together with sample probe, sample line, calibration valve assembly, moisture removal system, particulate filter, sample pump, sample flow rate control and sample gas manifold make up the sampling system.

2. Measurement System Performance Specifications
   1. Analyzer Calibration Error: Less than ±2 percent of the span for the zero, mid-range, and high-range calibration gases.

   2. Sampling System Bias: Less than ±5 percent of the span for the zero, and mid or high range calibration gases.

   3. Zero Drift: Less than ±3 percent of the span over the period of each run.

   4. Calibration Drift: Less than ±3 percent of the span over the period of each run.

3. Calibration Gases The calibration gases for the SO_2 analyzer are SO_2 in nitrogen.

   1. High-Range Gas: Concentration equivalent to 80 to 100

percent of the span.

2. Mid-Range Gas: Concentration equivalent to 40 to 60 percent of the span.

3. Zero Gas: Concentration of less than 0.25 percent of the span. Purified ambient air is used for the zero gas by passing air through a charcoal filter, or through one or more impingers containing a solution of 3 percent H_2O_2.

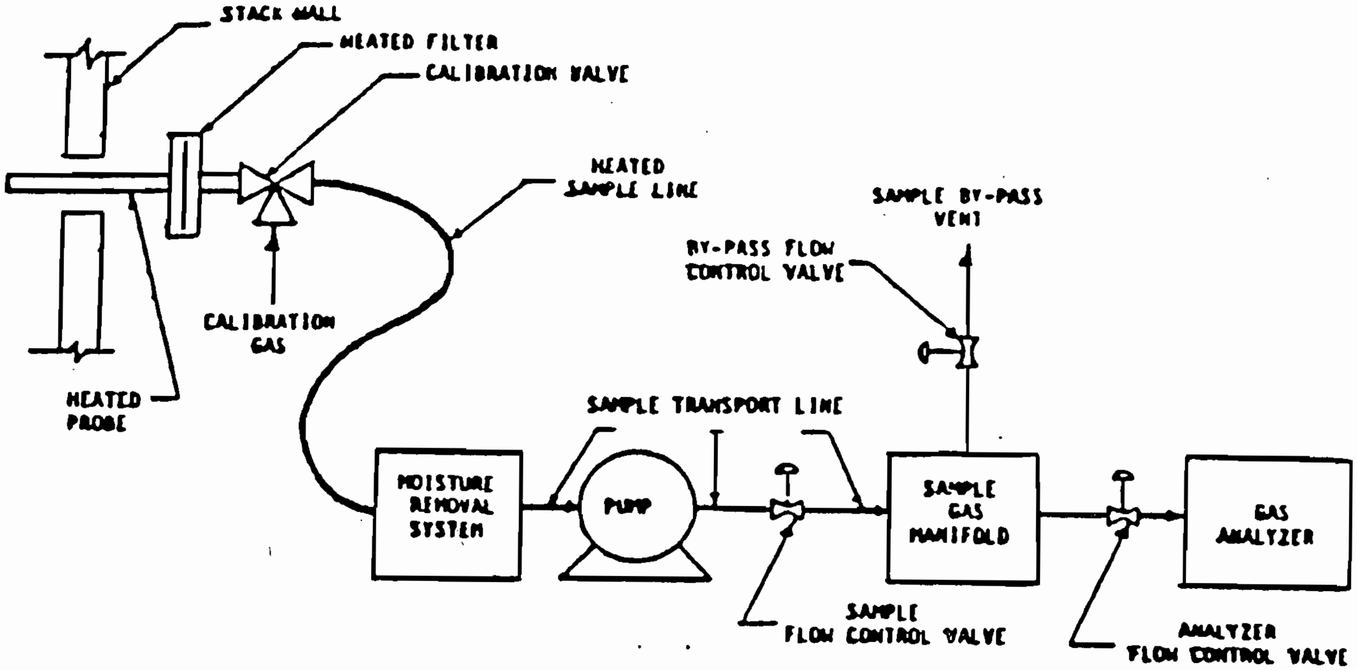
4. Calibration Gas Concentration Verification:
Calibration gases that are analyzed following the Environmental Protection Agency Traceability Protocol Number 1. A certification from the gas manufacturer that Protocol Number 1 was followed is included.

5. Measurement System Preparation
The measurement system was assembled by following the manufacturer's written instructions for preparing and preconditioning the gas analyzer and, as applicable, the other system components. The calibration gases were introduced and all necessary adjustments to calibrate the analyzer and the data recorder were performed.

6. Analyzer Calibration Error:
   1. The analyzer calibration error check is conducted by introducing calibration gases to the measurement system at any point upstream of the gas analyzer as follows: After the measurement system is prepared for use, the zero, mid-range, and the high-range gases are introduced to the analyzer. During this check, no adjustments to the system are made except those necessary to achieve the correct calibration gas flow rate at the analyzer. The analyzer calibration error check is considered invalid if the gas concentration displayed by

the analyzer exceeds ±2 percent of the span for any of the calibration gases.

2. Sampling System Bias Check:
The sampling system bias check was performed by introducing calibration gases at the calibration valve installed at the outlet of the sampling probe. A zero gas and either the mid-range or high-range gas, whichever most closely approximates the effluent concentrations, is used for this check as follows: The upscale calibration gas is introduced and recorded. During the sampling system bias check, the system is operated at the normal sampling rate, no adjustments to the measurement system, other than those necessary to achieve proper calibration gas flow rates at the analyzer, are made. Alternately, introduce the zero and upscale gases until a stable response is achieved. The tester determined the measurement system response time by observing the times required to achieve a stable response for both the zero and upscale gases. Note the longer of the two times as the response time. The sampling system bias check shall be considered invalid if the difference between the gas concentrations displayed by the measurement system for the analyzer calibration error check and for the sampling system bias check exceeds ±5 percent of the span for either the zero or upscale calibration gas.



Measurement System Schematic

TESTING EQUIPMENT EPA TEST METHOD 7E (NO_X)

(Instrumental Analyzer Procedure)

Principle: A gas sample is continuously extracted from a stack, and a portion of the sample is conveyed to an instrumental chemiluminescent analyzer for determination of NO_X concentration.

1. Sampling Train
   1. A Thermal Electron Model 10A (Figure A-2) Chemiluminescent NO-NO_X Gas Analyzer along with a Molytek Strip Chart Recorder together with sample probe, sample line, calibration valve assembly, moisture removal system, particulate filter, sample pump, sample flow rate control and sample gas manifold make up the sampling system.

2. Measurement System Performance Specifications
   1. Analyzer Calibration Error: Less than ±2 percent of the span for the zero, mid-range, and high-range calibration gases.

   2. Sampling System Bias: Less than ±5 percent of the span for the zero, and mid or high range calibration gases.

   3. Zero Drift: Less than ±3 percent of the span over the period of each run.

   4. Calibration Drift: Less than ±3 percent of the span over the period of each run.

3. <u>Calibration Gases</u> The calibration gases for the NO_x analyzer are NO in nitrogen.

1. High-range Gas: Concentration equivalent to 80 to 100 percent of the span.

2. Mid-Range Gas: Concentration equivalent to 40 to 60 percent of the span.

3. Zero Gas: Concentration of less than 0.25 percent of the span. Purified ambient air is used for the zero gas by passing air through a charcoal filter, or through one or more impingers containing a solution of 3 percent H_2O_2.

4. <u>Calibration Gas Concentration Verification:</u>
Calibration gases that are analyzed following the Environmental Protection Agency Traceability Protocol Number 1. A certification from the gas manufacturer that Protocol Number 1 was followed will be included in the test report and available in the field during the test.

5. <u>Measurement System Preparation:</u>
The measurement system was assembled by following the manufacturer's written instructions for preparing and preconditioning the gas analyzer and, as applicable, the other system components. The calibration gases were introduced and all necessary adjustments to calibrate the analyzer and the data recorder were performed.

6. Analyzer Calibration Error:

1. The analyzer calibration error check is conducted by introducing calibration gases to the measurement system at any point upstream of the gas analyzer as follows: After the measurement system is prepared for use, the zero, mid-range, and the high-range gases are introduced to the analyzer. During this check, no adjustments to the system are made except those necessary to achieve the correct calibration gas flow rate at the analyzer. The analyzer calibration error check is considered invalid if the gas concentration displayed by the analyzer exceeds ±2 percent of the span for any of the calibration gases.

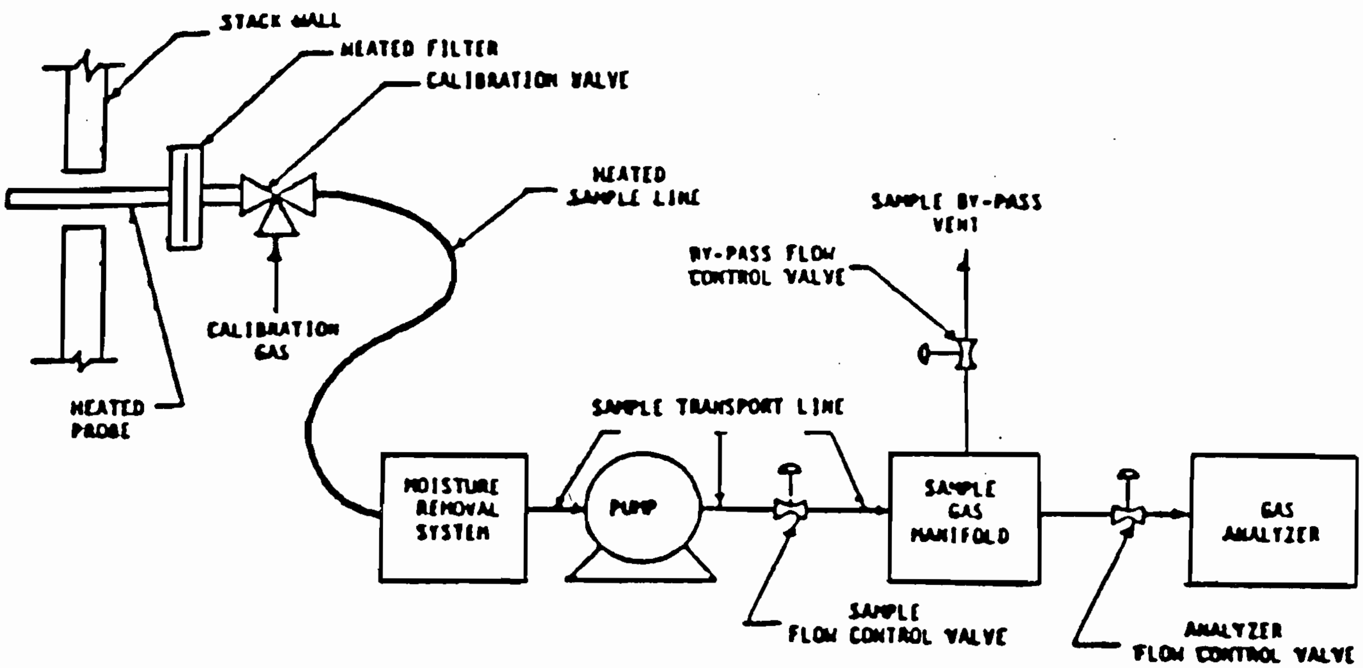
2. Sampling System Bias Check:

The sampling system bias check was performed by introducing calibration gases at the calibration valve installed at the outlet of the sampling probe. A zero gas and either the mid-range or high-range gas, whichever most closely approximates the effluent concentrations, is used for this check as follows: The upscale calibration gas is introduced and the gas concentration recorded. The zero gas is introduced and recorded. During the sampling system bias check, the system is operated at the normal sampling rate, no adjustments to the measurement system, other than those necessary to achieve proper calibration gas flow rates at the analyzer, are made. Alternately, introduce the zero and upscale gases until a stable response is achieved. The tester determined the measurement system response time by observing the times required to achieve a stable response for both the zero and upscale gases.

Note the longer of the two times as the response time. The sampling system bias check shall be considered invalid if the difference between the gas concentrations displayed by the measurement system for the analyzer calibration error check and for the sampling system bias check exceeds ±5 percent of the span for either the zero or upscale calibration gas.

7. <u>Sample Collection:</u>

1. The sampling probe was positioned at the first measurement point, and sampling began at the same rate as used during the system calibration drift test. A constant sampling rate was maintained (i.e., ±10 percent) during the entire run. The sampling time per run was the same as the total time required to perform a run using Method 7, plus twice the system response time. For each run, those measurements obtained after twice the response time of the measurement system had elapsed were used to determine the average effluent concentration.



Measurement System Schematic

METHOD 3A

DETERMINATION OF OXYGEN AND CARBON DIOXIDE CONCENTRATIONS IN EMISSIONS FROM STATIONARY SOURCES (INSTRUMENTAL ANALYZER PROCEDURE)

1. APPLICABILITY AND PRINCIPLE

1.1 Applicability. This method is applicable to the determination of oxygen (O_2) and carbon dioxide (CO_2) concentrations in emissions from stationary sources.

1.2 Principle. A sample is continuously extracted from the effluent stream: a portion of the sample stream is conveyed to an instrumental analyzer(s) for determination of O_2 and/or CO_2 concentration(s). Performance specifications and test procedures are provided to ensure reliable data.

2. RANGE AND SENSITIVITY

Same as in Method 6C, Sections 2.1 and 2.2, except that the span of the monitoring system shall be selected such that the average O_2 and CO_2 concentration is not less than 20 percent of the span.

3. DEFINITIONS

3.1 Measurement System. The total equipment required for the determination of the O_2 or CO_2 concentration. The measurement system consists of the same major subsystems as defined in Method 6C, Sections 3.1.1, 3.1.2, and 3.1.3.

3.2 Span, Calibration gas, Analyzer Calibration Error, Sampling System Bias, Zero Drift, Calibration Drift, Response time, and Calibration Curve. Same as Method 6C, Sections 3.2 through 3.8, and 3.10.

3.3 Interference Response. The output response of the measurement system to a component in the sample gas, other than the gas component being measured.

4. MEASUREMENT SYSTEM PERFORMANCE SPECIFICATIONS

Same as Method 6C, Sections 4.1 through 4.4.

5. APPARATUS AND REAGENTS

5.1 Measurement System. Any measurement system for O_2 or CO_2 that meets the specifications of this method. A schematic of an acceptable measurement system is shown in Figure 6C-1 of Method 6C. The essential components of the measurement system are described below:

5.1.1 Sample Probe. A leak-free probe, of sufficient length to traverse the sample points.

5.1.2 Sample Line. Tubing, to transport the sample gas from the probe to the moisture removal system. A heated sample line is not required systems that measure the O_2 or CO_2 concentration on a dry basis, or transport dry gases.

5.1.3 Sample Transport Line. Calibration Value Assembly, Moisture Removal System, Particulate Filter, Sample Pump, Sample Flow Rate Control, Sample Gas Manifold, and Data Recorder. Same as Method 6C, Sections 5.1.3 through 5.1.9, and 5.1.11, except that the requirements to use stainless steel, Teflon, and nonreactive gas filter do not apply.

5.1.4 Gas Analyzer. A Teledyne Model 326RA oxygen analyzer or Fuji ZFU/730 single beam infrared carbon dioxide analyzer; EPA approved. The analyzer shall meet the applicable performance specifications of Section 4. A means of controlling the analyzer flow rate and a device for determining proper sample flow rate (e.g., precision rotameter, pressure gauge downstream of all flow controls, etc.) shall be provided at the analyzer. The requirements for measuring and controlling the analyzer flow rate are not applicable if data are presented that demonstrate the analyzer is insensitive to flow variations over the range encountered during the test.

5.2 Calibration Gases. The calibration gases for CO_2 analyzers shall be CO_2 in N_2 or CO_2 in air. Alternatively, CO_2/SO_2, O_2/SO_2, or $O_2/CO_2/SO_2$ gas mixtures in N_2 may be used. Three calibration gases, as specified in Section 5.3.1 through 5.3.3 of Method 6C, shall be used. For O_2 monitors that cannot analyze zero gas, a calibration gas concentration equivalent to less than 10 percent of the span may be used in place of zero gas.

6. MEASUREMENT SYSTEM PERFORMANCE TEST PROCEDURES

Perform the following procedures before measurement of emissions (Section 7).

6.1 <u>Calibration Concentration Verification.</u> Follow Section 6.1 of Method 6C, except if calibration gas analysis is required, use Method 3 and change the acceptance criteria for agreement among Method 3 results to 5 percent (or 0.2 percent by volume, whichever is greater).

6.2 <u>Interference Response.</u> Conduct an interference response test of the analyzer prior to its initial use in the field. Thereafter, recheck the measurement system if changes are made in the instrumentation that could alter the interference response (e.g., changes in the type of gas detector). Conduct the interference response in accordance with Section 5.4 of Method 20.

6.3 <u>Measurement System Preparation.</u> Analyzer Calibration Error, and Sampling System Bias Check. Follow Sections 6.2 through 6.4 of Method 6C.

7. EMISSION TEST PROCEDURE

7.1 <u>Selection of Sampling Site and Sampling Points.</u> Select a measurement site and sampling points using the same criteria that are applicable to tests performed using Method 3.

7.2 Sample Collection. Position the sampling probe at the first measurement point, and begin sampling at the same rate as used during the sampling system bias check. Maintain constant rate sampling (i.e., ±10 percent) during the entire run. The sampling time per run shall be the same as for tests conducted using Method 3 plus twice the system response time. For each run, use only those measurements obtained after twice the response time of the measurement system has elapsed to determine the average effluent concentration.

7.3 Zero and Calibration Drift Test. Follow Section 7.4 of Method 6C.

8. QUALITY CONTROL PROCEDURES

The following quality control procedures are recommended when the results of this method are used for an emission rate correction factor, or excess air determination. The tester should select one of the following options for validating measurement results:

8.1 If both O_2 and CO_2 are measured using Method 3A, the procedures described in Section 4.4 of Method 3 should be followed to validate O_2 and CO_2 measurement results.

8.2 If only O_2 is measured using Method 3A, measurements of the sample stream CO_2 concentration should be obtained at the sample by-pass vent discharge using an Orsat or Fyrite analyzer, or equivalent. Duplicate samples should be obtained concurrent with at least one run. Average the duplicate Orsat or Fyrite analysis results for each run. Use the average CO_2 values for comparison with the O_2 measurements in accordance with the procedures described in Section 4.4 of Method 3.

8.3 If only CO_2 is measured using Method 3A, concurrent measurements of the sample stream CO_2 concentration should be obtained using an Orsat or Fyrite analyzer as described in Section 8.2. For each run, differences greater than 0.5 percent between the Method 3A results and the average of the duplicate Fyrite analysis should be investigated.

9. EMISSION CALCULATION

For all CO_2 analyzers, and for O_2 analyzers that can be calibrated with zero gas, follow Section 8 of Method 6C, except express all concentrations as percent, rather than ppm.

For O_2 analyzers that use a low-level calibration gas in place of a zero gas, calculate the effluent gas concentration using Equation 3A-1.

NOTE: See Section 9 for appropriate equation.

$$C_{gas} = \frac{C_{ma} - C_{oa}}{C_{ma} - C_{o}} (C - C_{m}) + C_{ma} \qquad \text{Equation 3A-1}$$

$$C_{gas} = (\bar{C} - C_{o}) \frac{C_{ma}}{C_{m} - C_{o}} \qquad \text{Equation 6C-1}$$

Where:

C_{gas} = Effluent gas concentration, dry basis, ppm.

$\bar{C}$ = Average gas concentration indicated by gas analyzer, dry basis, ppm.

C_{o} = Average of initial and final system calibration bias check responses for the zero gas, ppm.

C_{m} = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm.

C_{ma} = Actual concentration of the upscale calibration gas, ppm.

APPENDIX

SAMPLE CALCULATIONS

NOMENCLATURE

acf	= actual cubic feet
acfm	= actual cubic feet per minute
A	= effective area of flue in square feet
acm	= actual cubic meters
acmm	= actual cubic meters per minute
A_n	= inside area of sampling nozzle in square feet
B_{ws}	= water vapor in gas stream, proportion by volume
%C	= percent carbon by weight, dry basis
%CO	= percent carbon monoxide by volume, dry basis
$\%CO_2$	= percent carbon dioxide by volume, dry basis
C_p	= pitot tube coeffecient
D_I	= dust loading per heat input in pounds (grams) per million Btu (calories) per Fr constant
D_I'	= dust loading per heat input in pounds (grams) per million Btu (calories) per Fr calculated
dscf	= dry standard cubic feet
dscfh	= dry standard cubic feet per hour
dscm	= dry standard cubic meters
dscmh	= dry standard cubic meters per hour
fps	= feet per second
F_r	= ratio factor of dry flue gas volume to heat value of combusted fuel in dry standard cubic feet (meters) per million Btu (calories)
gms	= grams
gm-mole	= gram-mole
grs	= grains
ΔH	= orifice pressure drop in inches water, average
%H	= percent hydrogen by weight, dry basis
H_c	= heat of combustion in Btu per pound, dry basis
hr	= hour
%I	= percent isokinetic
in. Hg	= inches mercury
lbs	= pounds
lb-mole	= pound-mole
%M	= percent moisture by volume
mmBtu	= million Btu
mmcal	= million calories
mm Hg	= millimeters mercury
mps	= meters per second
M_s	= molecular weight in pounds (gram) per pound (gram) mole (wet basis)
%N	= percent nitrogen by weight, dry basis
$\%N_2$	= percent nitrogen by difference, dry basis
%O	= percent oxygen by difference, dry basis
$\%O_2$	= percent oxygen by volume, dry basis
P_b	= barometric pressure in inches mercury
P_{std}	= standard absolute pressure (29.92 in Hg)
P_s	= absolute pressure in flue in inches (millimeters) mercury
P_f	= static pressure in flue in inches water, average
$\sqrt{\Delta P}$	= square root of velocity head in inches water, average
%S	= percent sulfur by weight, dry basis
scf	= standard cubic feet
scm	= standard cubic meters
T_{std}	= absolute temperature of air in degrees Rankine at standard conditions (528 degrees)
T_S	= absolute temperature of flue gas in degrees Rankin, average
T_m	= absolute temperature at meter in degrees Rankine, average
V_S	= velocity of flue gas in feet (meters) per second
V_I	= volume of condensate through the impingers in milliliters
V_{lc}	= volume of liquid collected in condenser in milliliters plus weight of liquid absorbed in silica gel in grams indicated as milliliters
V_m	= volume of metered gas measured at meter conditions in cubic feet (meters)
V_{ms}	= volume of metered gas corrected to dry standard conditions in cubic feet (meters)
V_o	= volume of flue gas at actual conditions in cubic feet (meters) per minute
Q_{sd}	= volume of flue gas corrected to dry standard conditions in cubic feet (meters) per hour
V_t	= total volume of flue gas sampled at actual conditions in cubic feet (meters)
V_w	= volume of water vapor in metered gas corrected to standard conditions in cubic feet (meters)
V_{wc}	= volume of water condensed in impingers corrected to standard conditions
V_{wsg}	= volume of water collected in silica gel corrected to standard conditions
W_a	= total weight of dust collected per unit volume in grains (grams) per actual cubic feet (meters)
W_d	= total weight of dust collected per unit volume in pounds (grams) per dry standard cubic feet (meters)
W_g	= total weight of dust collected in grams
W_h	= total weight of dust collected per unit volume in pounds (grams) per hour, dry basis
W_p	= total weight of dust collected in pounds
W_s	= total weight of dust collected per unit volume in grains (grams) per dry standard cubic feet (meters)
W_{sg}	= impinger silica gel weight gain in grams
Y	= metered gas volume correction factor
Θ	= total elapsed sampling time in minutes

(1) ABSOLUTE FLUE PRESSURE (in. Hg)

$$P_s = (\pm P_f \div 13.6) + P_b$$

(2) WATER VAPOR VOLUME IN METERED GAS CORRECTED TO STANDARD CONDITIONS (scf)

$$V_{wc} = .04707 \times V_l \qquad V_{wsg} = .04715 \times W_{sg}$$

$$V_w = V_{wc} + V_{wsg}$$

(3) METERED GAS VOLUME CORRECTED TO STANDARD CONDITIONS (scf)

$$V_{ms} = 17.64 \times Y \times V_m \frac{P_b + (\Delta H/13.6)}{T_m}$$

(4) PERCENT MOISTURE IN FLUE GAS

$$B_{ws} = \frac{V_w}{(V_{ms} + V_w)} \qquad \%M = B_{ws} \times 100$$

(5) AVERAGE RESULTS OF FLUE GAS ANALYSIS

$$\%N_2 \text{ dry} = 100 - (\%CO_2 + \%O_2 + \%CO)$$

(6) APPROXIMATE MOLECULAR WEIGHT OF FLUE GAS (WET BASIS) (lb/lb-mole)

$$M_s = (18 \times B_{ws}) + \Big((.440\,(\%CO_2) + .320\,(\%O_2) + .280\,(\%N_2 + \%CO)\Big) \times (1 - B_{ws})$$

(7) GAS VELOCITY IN FLUE (fps)

$$V_s = 85.49 \times C_p \times (\sqrt{\Delta P}\ )\text{ avg.} \sqrt{\frac{T_s}{P_s \times M_s}}$$

(8) FLUE GAS VOLUME AT ACTUAL CONDITIONS (acfm)

$$V_o = V_s \times A \times 60$$

(9) FLUE GAS VOLUME CORRECTED TO DRY STANDARD CONDITIONS (dscfh)

$$Q_{sd} = \frac{T_{std}}{29.92} \times \frac{P_s}{T_s} \times V_o \times (1 - B_{ws}) \times 60$$

(10) TOTAL FLUE GAS VOLUME SAMPLED AT ACTUAL CONDITIONS (acf)

$$V_t = \left[V_m \times Y \times \frac{T_s}{T_m} \times \left(\frac{P_b + (\Delta H/13.6)}{P_s}\right)\right] + \left(0.00267 \times V_{lc} \times \frac{T_s}{P_s}\right)$$

(11) DUST CONCENTRATION FOR INDIRECT HEATING UNIT ACTUAL CONDITIONS AND STANDARD CONDITIONS

$W_g = \text{gms}$

$W_p = 0.002205 \times W_g$ (lb)

$W_d = \dfrac{V_p}{V_{ms}}$ (lb/dscf)

$W_h = W_d \times Q_{sd}$ (lb/hr dry)

$W_a = \dfrac{7000 \times W_p}{V_t}$ (gr/acf)

$W_s = 7000 \times W_d$ (gr/dscf)

$D_l = \dfrac{9780 \times 20.9 \times W_d}{(20.9 - \%O_2)}$ (lb/mmBtu with constant 9780Fr)

$F_r = \dfrac{10^6 \times [(3.64 \times \%H) + (1.53 \times \%C) + (0.57 \times \%S) + (0.14 \times \%N) - (0.46 \times \%O)]}{H_c}$ (dscf/mmBtu)

$D_l' = \dfrac{20.9 \times W_d \times F_r}{(20.9 - \%O_2)}$ (lb/mmBtu with calculated F_r)

(12) PERCENT OF ISOKINETIC SAMPLING

$$\%I = \frac{1.667 \times T_s \times \left\{0.00267 \times V_{lc} + \left[\dfrac{V_m \times Y}{T_m} \times \left(P_b + \Delta H/13.6\right)\right]\right\}}{\Theta \times V_s \times P_s \times A_n}$$

NO_x CALCULATION

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lb/dscf = $1.194 \times 10^{-7} \times$ PPM

lb/mmBtu = lb/dscf x F Factor x $\dfrac{20.9}{(20.9 - \%O_2)}$

lb/hour = lb/dcsf x dscfm x 60 min./hr.

SAMPLE CALCULATION

______ lb/dscf = 1.194×10^{-7} x ______ PPM

______ lb/mmBtu = ______ lb/dscf x ______ x $\dfrac{20.9}{(20.9 - \_\_\_\_)}$

______ lb/hr = ______ lb/dscf x ______ dscfm x 60

SO_2 CALCULATION

$$\text{lb/dscf} = 1.660 \times 10^{-7} \times \text{PPM}$$

$$\text{lb/MBtu} = \text{lb/dscf} \times \text{F Factor} \times \frac{20.9}{(20.9 - \%O_2)}$$

$$\text{lb/hour} = \text{lb/dscf} \times \text{dscfm} \times 60\ \text{min./hr.}$$

TSA FIELD DATA SHEETS

Particulate Field Data Sheet

Client: ST. JOHNS POWER PLANT	Date: 11-6-95	Page 1 Of 2

Project No.: 95-420-FL	Operator: A/ BRADLEY
Sampling Location: UNIT 1 STACK	Run No.: 1
Filter No.: 95-045	Acetone No.:
Condensate: 146	Silica Gel: 28.9
Barometric Pressure: 29.95	Static Pressure: -.50
Probe Number: A-10-1-FL	
Nozzle Diameter: .180	Nozzle Number: 2-2
Pitot Coefficient: .834	Pitot Number:
Meter Corr. Factor: .96	Meter-Orifice: RAC #2 2.903
Sample Pt. Time: 10 MIN.	Assumed % Moisture: 12
Leak Test Before: .006 AT 10"	After: .005 AT 12"

Orsat Analysis

CO_2	$+O_2$	O_2	CO
12.8	19.0	6.2	
12.8	19.0	6.2	

Sample Point	ΔP	$\sqrt{\Delta P}$	ΔH	Stack	Probe	Imp. Out	Oven	Meter In	Meter Out	Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
				Temperature °F							
START 0925											990.266
A1	1.3	1.140	1.04	148	315	66	335	94	94	1.0	996.12
2	1.2	1.095	.96	147	318	66	337	99	94	1.0	1.88
3	1.1	1.049	.89	142	313	63	340	104	95	1.0	7.31
B1	1.3	1.140	1.06	146	315	64	331	103	96	1.0	13.59
2	1.3	1.140	1.08	151	321	63	328	108	97	1.0	19.52
3	1.1	1.049	.91	150	328	63	334	110	98	1.0	25.23
C1	1.3	1.140	1.09	148	325	63	328	107	98	1.0	31.41
2	1.2	1.095	1.01	148	332	64	319	109	99	1.0	37.30
3	1.10	1.049	.93	150	328	64	324	111	100	1.0	42.91
D1	1.3	1.140	1.09	152	321	65	320	110	100	1.0	49.11
2	1.3	1.140	1.09	156	315	65	324	112	101	1.0	55.20
3	1.1	1.049	.93	159	320	65	317	113	101	1.0	60.843
STOP 11:28											
											70.577
		1.102	1.01	150			A: 102				

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before N/A After N/A

Client		Date	Page	Of
ST. JOHNS POWER PARK		11-6-95	1	2

Project No.	95-420-F1
Operator	A I BRADIBY
Sampling Location	UNIT 1 STACK
Run No.	2
Filter No.	95-042
Acetone No.	
Condensate	150
Silica Gel	37.0
Barometric Pressure	29.95
Static Pressure	-.50
Probe Number	A-10-1-F1
Nozzle Diameter	.180
Nozzle Number	0-2
Pitot Coefficient	.834
Pitot Number	
Meter Corr. Factor	.96
Meter-Orifice	RAC #2 2.903
Sample Pt. Time	10 min
Assumed % Moisture	12%
Leak Test Before	.002 AT 10"
Leak Test After	.000 AT 10"

Orsat Analysis

CO_2	$+O_2$	O_2	CO
13.2	19.2	6.0	
13.2	19.2	6.0	

Sample Point	ΔP	√ΔP	ΔH	Temperature °F Stack	Probe	Imp. Out	Oven	Meter In	Meter Out	Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
11:55											61.256
D1	1.3	1.140	1.09	166	314	63	330	98	99	1.0	67.33
2	1.3	1.140	1.08	163	320	63	332	103	98	1.0	73.44
3	1.1	1.049	.90	159	318	62	335	107	98	1.0	79.06
C1	1.3	1.140	1.07	152	324	62	328	109	99	1.0	85.13
2	1.4	1.183	1.17	152	325	63	324	110	99	1.0	91.52
3	1.1	1.049	.92	150	329	62	321	111	100	1.0	97.16
B1	1.3	1.140	1.09	150	332	63	316	107	100	1.0	103.22
2	1.2	1.095	1.00	154	326	64	321	109	100	1.0	109.13
3	1.0	1.000	.83	152	330	64	314	108	100	1.0	114.57
A1	1.3	1.140	1.09	156	325	64	319	107	101	1.0	120.54
2	1.3	1.140	1.09	156	329	65	315	108	100	1.0	126.64
3	1.1	1.049	.92	188	332	65	318	108	100	1.0	132.398
STOP 1400											
		1.105	1.02	156				103			71.142

Pitot Tube Leak Check: Before O.K After OK

Integrated Bag Leak Check: Before NA After NA

F2

TSA

Particulate Field Data Sheet

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Client: ST. JOHNS POWER PARK		Date: 11-6-95	Page 1 Of 2
Project No.: 95-420-01	Operator: A / BRADLEY		Orsat Analysis
Sampling Location: UNIT 1 STACK	Run No.: 3		
Filter No.: 95-41	Acetone No.:	Condensate: 142 SILICA GEL 38.4	
Barometric Pressure: 29.95	Static Pressure: -.50	Probe Number: A-10-1-F1	
Nozzle Diameter: .180	Nozzle Number: 2-2	Pitot Coefficient: .834	Pitot Number:
Meter Corr. Factor: .96	Meter-Orifice: RAC #2 2.903		
Sample Pt. Time: 10 min.	Assumed % Moisture: 12%	Leak Test Before: .008 AT 8"	After: .008 AT 10"

CO_2	$+O_2$	O_2	CO
13.2	19.4	6.2	
13.2	19.4	6.2	

Sample Point	ΔP	√ΔP	ΔH	Stack °F	Probe °F	Imp. Out °F	Oven °F	Meter In °F	Meter Out °F	Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
1420											132.752
A1	1.3	1.140	1.09	169	324	65	330	97	96	1.0	138.84
2	1.4	1.183	1.14	165	328	65	332	100	96	1.0	145.10
3	1.1	1.049	.90	165	325	64	326	105	96	1.0	150.73
B1	1.3	1.140	1.09	163	330	64	324	107	97	1.0	156.23
2	1.3	1.140	1.09	161	321	64	320	108	98	1.0	161.75
3	1.1	1.049	.90	164	325	63	317	108	98	1.0	167.45
C1	1.3	1.140	1.06	163	329	63	321	105	98	1.0	173.55
2	1.2	1.095	.98	162	334	62	318	106	98	1.0	179.38
3	1.1	1.049	.90	163	327	63	311	107	98	1.0	184.98
D1	1.4	1.183	1.14	162	331	64	316	107	98	1.0	191.32
2	1.3	1.140	1.06	161	328	64	317	108	98	1.0	197.40
3	1.0	1.000	.81	160	322	64	320	109	98	1.0	202.706
STOP 1626											
		1.109	1.01	163				102			69.954

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before NA After NA

Client: SURPP			Date: 11-7-95	1	2
Project No.: 95-420-F1	Operator: A I BRADLEY		Orsat Analysis		
Sampling Location: UNIT 2 STACK	Run No.: 1				

Filter No.	Acetone No.	Condensate	Silica Gel
95-059		134	22.6

Barometric Pressure	Static Pressure	Probe Number	Pitot Number
29.74	-.68	A-10-1-F1	

Nozzle Diameter	Nozzle Number	Pitot Coefficient	Meter Corr. Factor	Meter-Orifice
.180	2-2	.834	.96	RAC#2 2.903

Orsat Analysis

CO_2	$+O_2$	O_2	CO
12.6	19.0	6.4	
12.6	19.0	6.4	

Sample Pt. Time	Assumed % Moisture	Leak Test Before	Leak Test After
10 MIN	12%	.005 AT 10"	.003 AT 5"

Sample Point	ΔP	$\sqrt{\Delta P}$	ΔH	Temperature °F Stack	Probe	Imp. Out	Oven	Meter In	Meter Out	Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
START 0800											203.049
A1	1.4	1.183	1.12	160	312	60	315	97	96	0	209.42
2	1.3	1.140	1.04	157	318	60	332	100	96	0	215.44
3	1.1	1.049	.88	155	321	60	328	105	97	0	220.91
B1	1.3	1.140	1.04	156	324	59	324	103	97	0	226.90
2	1.2	1.095	.97	153	329	61	320	106	97	0	232.68
3	1.1	1.049	.89	152	323	61	325	107	98	0	238.28
C1	1.2	1.095	.97	153	319	61	328	107	98	0	244.05
2	1.2	1.095	.97	151	325	62	332	107	98	0	249.81
3	1.1	1.049	.89	151	317	62	330	107	98	0	255.40
D1	1.4	1.183	1.14	152	313	63	324	105	98	0	261.65
2	1.3	1.140	1.06	154	319	63	321	106	98	0	268.04
3	1.0	1.000	.81	161	322	63	320	108	98	0	273.488
STOP 1004											
		1.102	.96	155				101			
											70.439

Pitot Tube Leak Check: Before O.K After O.K

Integrated Bag Leak Check: Before N/A After N/A

TSA

Particulate Field Data Sheet

Client	Date	Page	Of
SJRPP	11-7-93	1	2

Project No.	Operator	Run No.
95-420-F1	A. BRADLEY	2

Sampling Location: UNIT 2 STACK

Filter No.	Acetone No.	Condensate	Silica Gel
95-046		160	26.3

Barometric Pressure	Static Pressure	Probe Number
29.74	-.68	A-10-1-F1

Nozzle Diameter	Nozzle Number	Pitot Coefficient	Pitot Number
.180	2-2	.834	

Meter Corr. Factor	Meter-Orifice
.96	RAC#2 2.903

Orsat Analysis

CO_2	$+O_2$	O_2	CO
13.0	19.2	6.2	
13.0	19.2	6.2	

Sample Pt. Time	Assumed % Moisture	Leak Test Before	Leak Test After
10 min.	12 %	.006 AT 8"	.005 AT 5"

Sample Point	ΔP	√ΔP	ΔH	Temperature °F Stack	Probe	Imp. Out	Oven	Meter In	Meter Out	Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
START 11:00											273.714
D1	1.3	1.140	1.06	157	310	63	329	98	97	0	279.70
2	1.4	1.183	1.14	153	317	63	332	97	91	0	285.91
3	1.1	1.049	.88	155	324	62	327	99	91	0	291.47
C1	1.3	1.140	1.05	154	328	62	325	100	91	0	297.53
2	1.3	1.140	1.05	154	321	63	321	101	91	0	303.58
3	1.1	1.049	.88	152	317	63	324	103	91	0	309.07
B1	1.4	1.183	1.13	154	323	64	320	100	91	0	315.32
2	1.3	1.140	1.05	154	318	64	320	104	94	0	321.30
3	1.1	1.049	.88	155	315	64	319	103	94	0	326.74
A1	1.3	1.140	1.05	153	321	65	323	99	94	0	332.73
2	1.2	1.095	.97	158	316	65	321	98	93	0	338.56
3	1.0	1.000	.80	164	320	65	316	99	93	0	343.891
STOP 1305											
		1.109	1.00	155				96			70.177

Pitot Tube Leak Check: Before OK After OK

Integrated Bag Leak Check: Before N/A After N/A

Client	Date	Page 1 of 2
SURPP	11-7-95	

Project No.	Operator
95-420-04	AI BRADLEY

Sampling Location	Run No.
UNIT 2 STACK	3

Filter No.	Acetone No.	Condensate	Silica
95-047		176	21.1

Barometric Pressure	Static Pressure	Probe Number
29.74	-.68	A-10-1-F1

Nozzle Diameter	Nozzle Number	Pitot Coefficient	Pitot Number
.180	2-2	.834	

Meter Corr. Factor	Meter-Orifice
.96	RAC #2 2.903

Sample Pt. Time	Assumed % Moisture	Leak Test Before	Leak Test After
10 min.	12%	.006 AT 6"	.004 AT 10"

Orsat Analysis

CO_2	$+O_2$	O_2	CO
12.9	19.1	6.2	
12.9	19.1	6.2	

Sample Point	ΔP	√ΔP	ΔH	Stack (°F)	Probe (°F)	Imp. Out (°F)	Oven (°F)	Meter In (°F)	Meter Out (°F)	Vac. Pr (in. HG)	Dry Gas Meter Reading in Cu. Ft.
START 1325											344.163
A1	1.3	1.140	1.05	171	319	64	323	90	89	0	350.10
2	1.2	1.095	.97	164	324	64	320	93	89	0	355.93
3	1.1	1.049	.88	160	328	64	325	94	88	0	361.45
B1	1.4	1.183	1.13	160	321	64	321	96	88	0	367.74
2	1.3	1.140	1.05	160	326	65	317	97	89	0	373.62
3	1.1	1.049	.88	159	319	65	322	97	90	0	379.16
C1	1.3	1.140	1.05	160	321	65	328	96	90	0	385.18
2	1.2	1.095	.97	160	316	64	331	96	90	0	390.91
3	1.1	1.049	.88	158	320	64	335	97	90	0	396.46
D1	1.3	1.140	1.05	159	324	64	330	96	90	0	402.51
2	1.3	1.140	1.05	160	327	63	327	97	90	0	408.43
3	1.0	1.000	.80	158	321	63	324	97	90	0	413.836
STOP 1530											
		1.102	.98	161				92			
											(69.673)

Pitot Tube Leak Check: Before O.K. After OK

Integrated Bag Leak Check: Before N/A After N/A

Visible Emissions Evaluation Data Sheet

Client JEA
Project No. 95-420 FL
Plant Name St. John River Power Park
Location Ash Silo Unit 1
Type of Facility Power Gen.

Observer J. Tayfel
Date 11-6-95
Observation began 1045
ended 1145

Source Identification
(Stack, Duct, etc.) 3 rec. stacks side by side

Observer Location
(Diagram on back of sheet)
Distance from Observer to source ~ 160 yds
Height of Source (above ground) ~ 100 ft

Weather Conditions
Wind Direction out of East
Wind Speed ~ 2 to 5 mph
Temperature ~ 72°
Position of Sun East / South East
Sky Condition partly cloudy
(clear, overcast, %clouds, color of clouds, etc.)

Plume Description
Color Clear
Background Blue / Gray
Type (wet or dry)* dry Dist.

Comments Fugitive Emissions

Observers Signature
James Tayfel

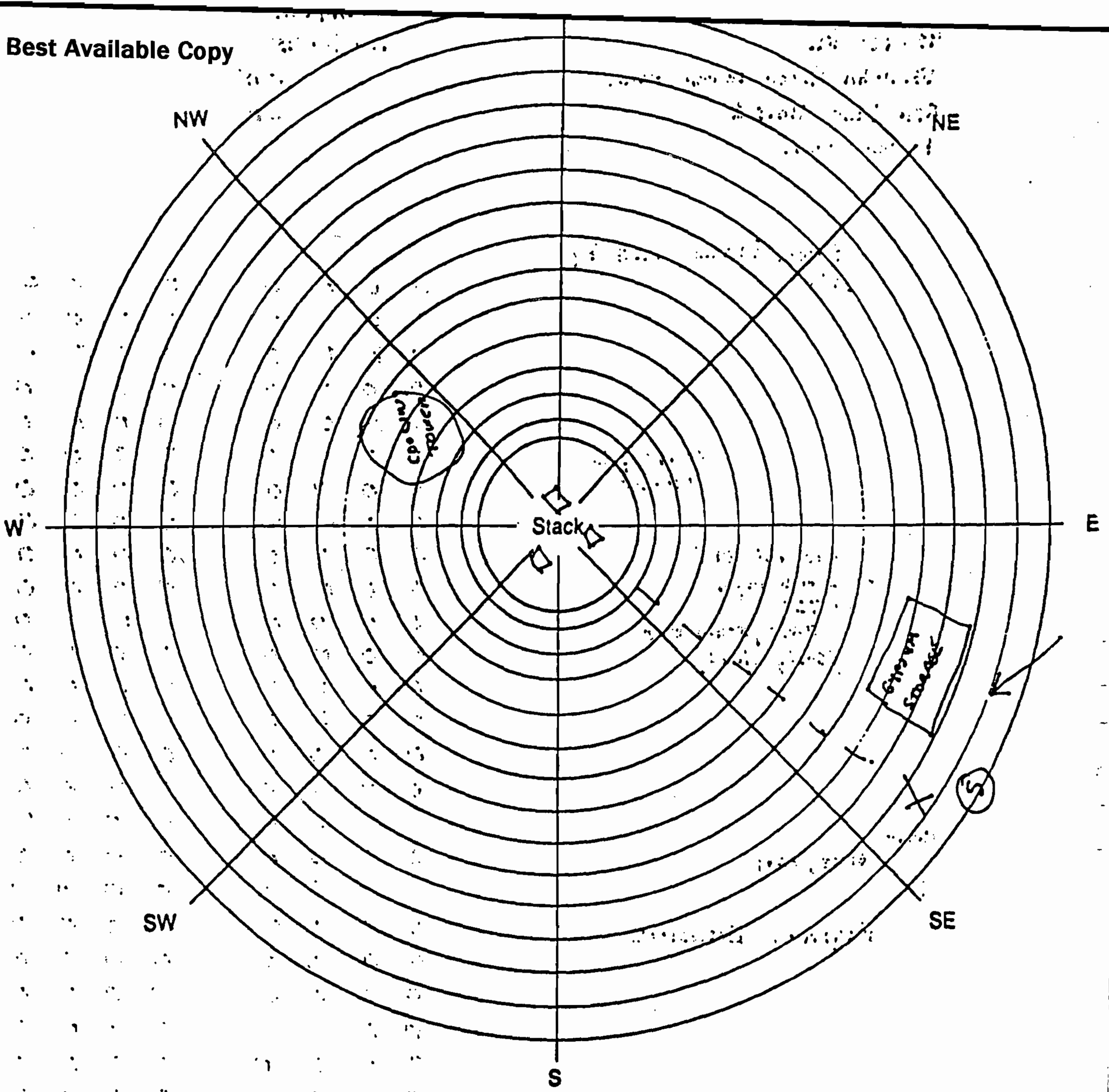
Date of Last EPA Method 9 Examination
July 7 1995

Examination Passed in EPA Region
Jacksonville, FL.

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

*If wet, distance (ft.) from plume outlet to point in plume where observations made

TSA



LOCATE THE FOLLOWING ON THE DIAGRAM

1. The stack configuration with the stack under observation in the center
2. Observer's position using X to indicate position.
3. Arrow pointing direction wind is blowing.
4. Dotted line between observer and plume indicating observers line of sight when making readings.
5. Circle with S in center to indicate sun location.
6. Any large structures or significant topographical features.

NOTE: Stack configuration is not proportional to distances in feet from stack in the diagram.

Total Source A[illegible]ysis, Inc.
Enviromental Testin[illegible] [illegible]onsultants

Visible Emissions Evaluation Data Sheet

Client JEA

Observer J. Tayfel

Project No. 95-420 FL

Date 11-6-95

Plant Name St. John River Power Park

Observation began 14~~35~~ 40

Location Ash Silo Unit 2

ended 15~~37~~ 40

Type of Facility Power Gen.

Source Identification
(Stack, Duct, etc.) 3 ~~dia~~ rec. stacks side by side

Observer Location
(Diagram on back of sheet)
Distance from Observer to source ~ 550 ft
Height of Source (above ground) ~ 100 ft

Weather Conditions
Wind Direction out of East
Wind Speed 2 to 5 mph
Temperature ~ 71°
Position of Sun S/SW
Sky Condition partly cloudy
(clear, overcast, %clouds, color of clouds, etc.)

Plume Description
Color Clear
Background Blue/Gray
Type (wet or dry)* Dist.

Comments Fugitive Emissions

Observers Signature
James Tayfel

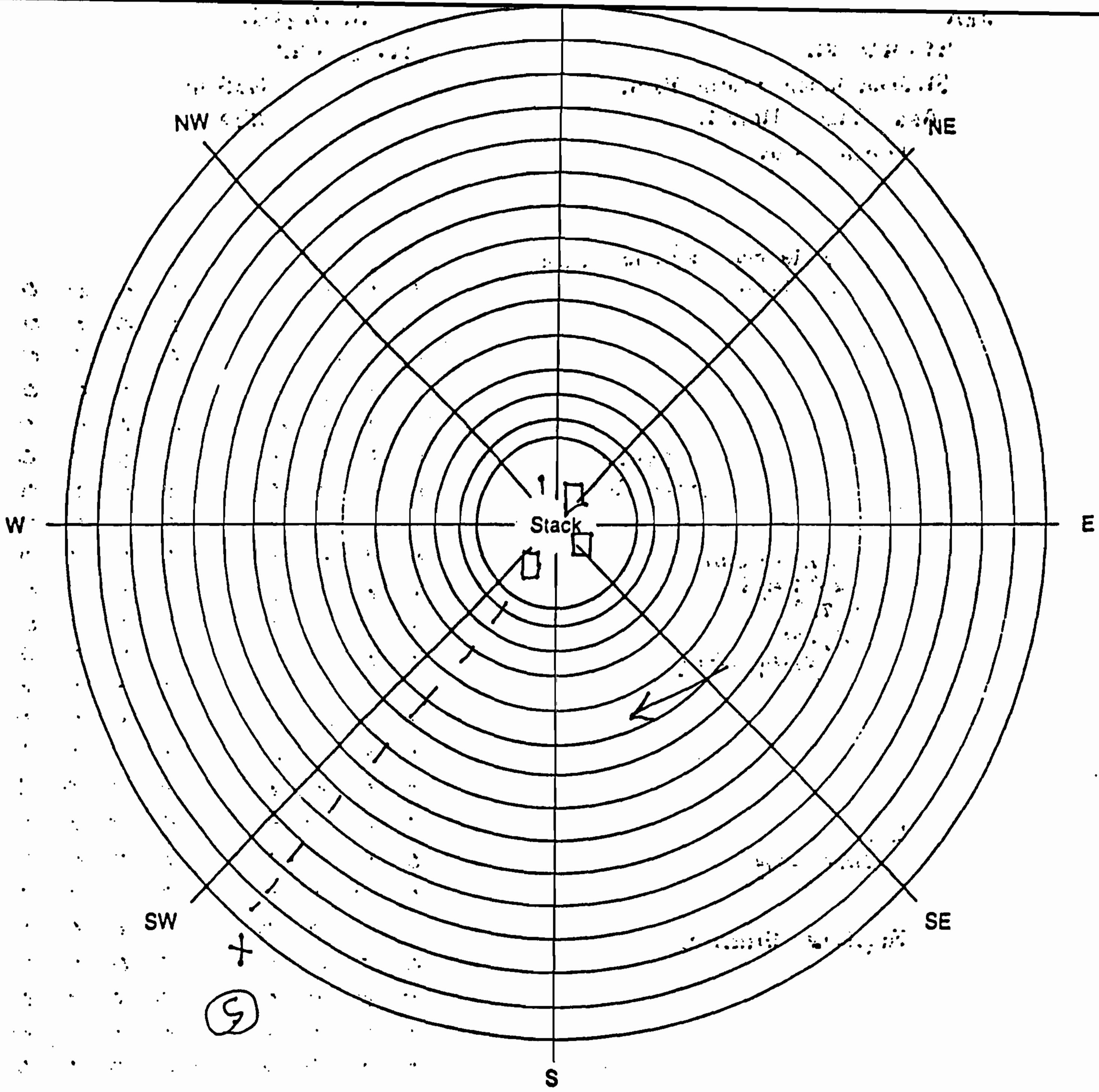
Date of Last EPA Method 9 Examination
July 7, 1995

Examination Passed in EPA Region
Jacksonville, FL.

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

*If wet, distance (ft.) from plume outlet to point in plume where observations made

TSA



LOCATE THE FOLLOWING ON THE DIAGRAM

1. The stack configuration with the stack under observation in the center
2. Observer's position using X to indicate position.
3. Arrow pointing direction wind is blowing.
4. Dotted line between observer and plume indicating observers line of sight when making readings.
5. Circle with S in center to indicate sun location.
6. Any large structures or significant topographical features.

NOTE: Stack configuration is not proportional to distances in feet from stack in the diagram.

F10

Total Source A[illegible]ysis, Inc.
Environmental Testin[illegible] [illegible]onsultants

Visible Emissions Evaluation Data Sheet

Client: JEA
Project No. 95-420 FL
Plant Name: St. John River Power Park
Location: ASH Silo Combined Unit 1 and 2
Type of Facility: Power Gen.

Observer: J. Tayfel
Date: 11-6-95
Observation began: 1540
ended: 1640

Source Identification
(Stack, Duct, etc.) 6 rec. STACKS, SIDE BY SIDE

Observer Location
(Diagram on back of sheet)
Distance from Observer to source: ~ 550 ft
Height of Source (above ground): ~ 100 ft

Weather Conditions
Wind Direction: OUT OF EAST
Wind Speed: 2 TO 5 mph
Temperature: ~ 70°
Position of Sun: SW
Sky Condition: Scattered clouds
(clear, overcast, %clouds, color of clouds, etc.)

Plume Description
Color: Clear
Background: Blue/GRey
Type (wet or dry*) dry Dist.

Comments: Fugitive Emissions

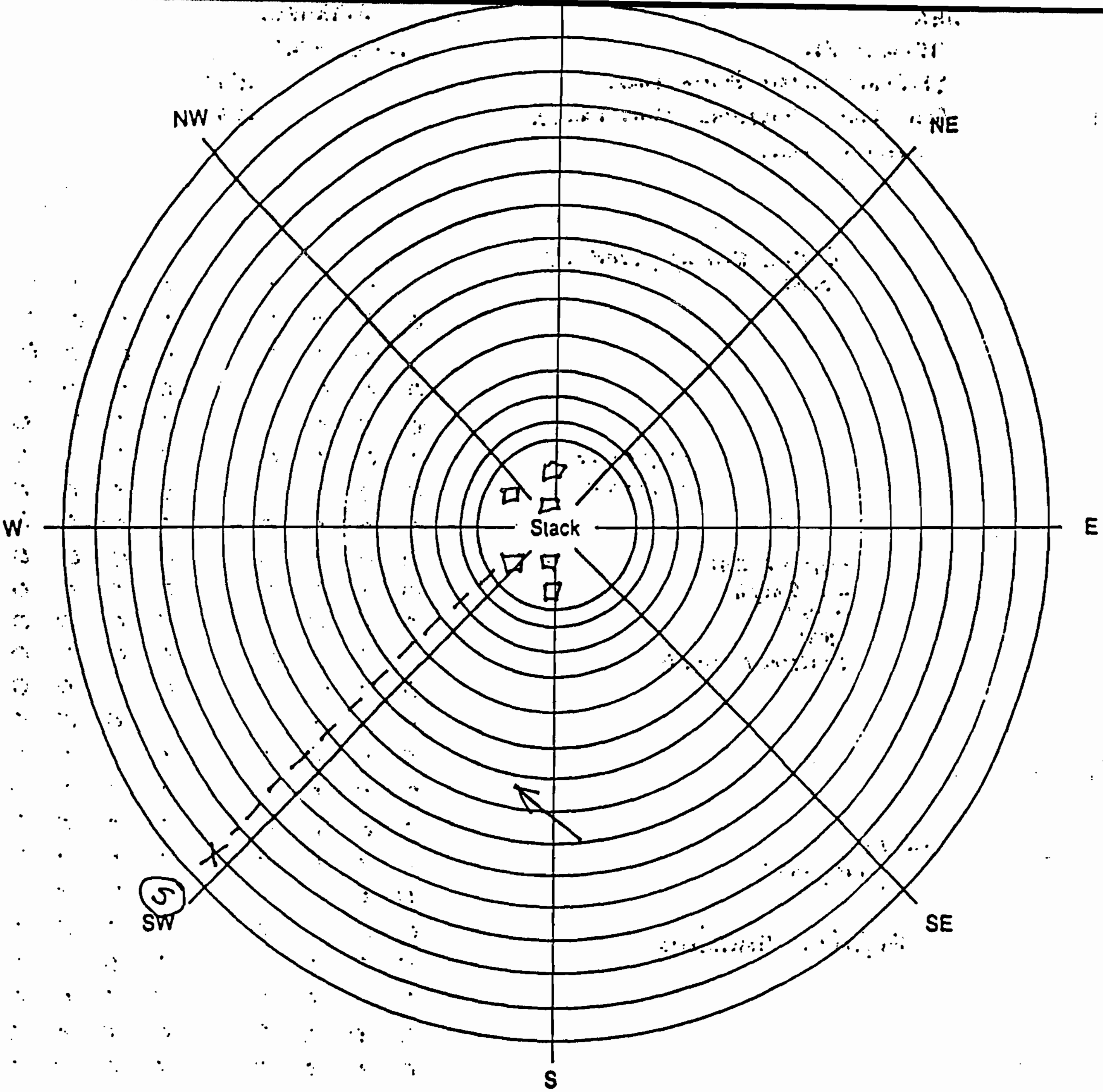
Min.	0	15	30	45	Min.	0	15	30	45
	Seconds					Seconds			
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41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

Observers Signature: James Tayfel

Date of Last EPA Method 9 Examination: July 7, 1995

Examination Passed in EPA Region: Jacksonville, FL.

*If wet, distance (ft.) from plume outlet to point in plume where observations made



LOCATE THE FOLLOWING ON THE DIAGRAM

1. The stack configuration with the stack under observation in the center
2. Observer's position using X to indicate position.
3. Arrow pointing direction wind is blowing.
4. Dotted line between observer and plume indicating observers line of sight when making readings.
5. Circle with S in center to indicate sun location.
6. Any large structures or significant topographical features.

NOTE: Stack configuration is not proportional to distances in feet from stack in the diagram.

F12

Total Source A ysis, Inc.
Enviromental Testi , onsultants

Visible Emissions Evaluation Data Sheet

Client JEA.
Project No. 95-420 FL
Plant Name St. John River Power Park
Location Unit 1 Stack
Type of Facility Power Gen.

Observer J. Tayfel
Date 11-6-95
Observation began 1230
ended 1330

Source Identification (Stack, Duct, etc.) Stack Unit 1

Observer Location
(Diagram on back of sheet)
Distance from Observer to source ~ ~1500 ft
Height of Source (above ground) ~ 580 ft.

Weather Conditions
Wind Direction E/SE
Wind Speed 2 to 5 mph
Temperature ~ 77°
Position of Sun South
Sky Condition Cloudy ~ 80%
(clear, overcast, %clouds, color of clouds, etc.)

Plume Description
Color Clear
Background grey / Blue
Type (wet or dry) wet Dist.

Comments Run#2 of Particulate, Soot Blow Run.

Observers Signature James Tayfel

Date of Last EPA Method 9 Examination
July 7, 1995

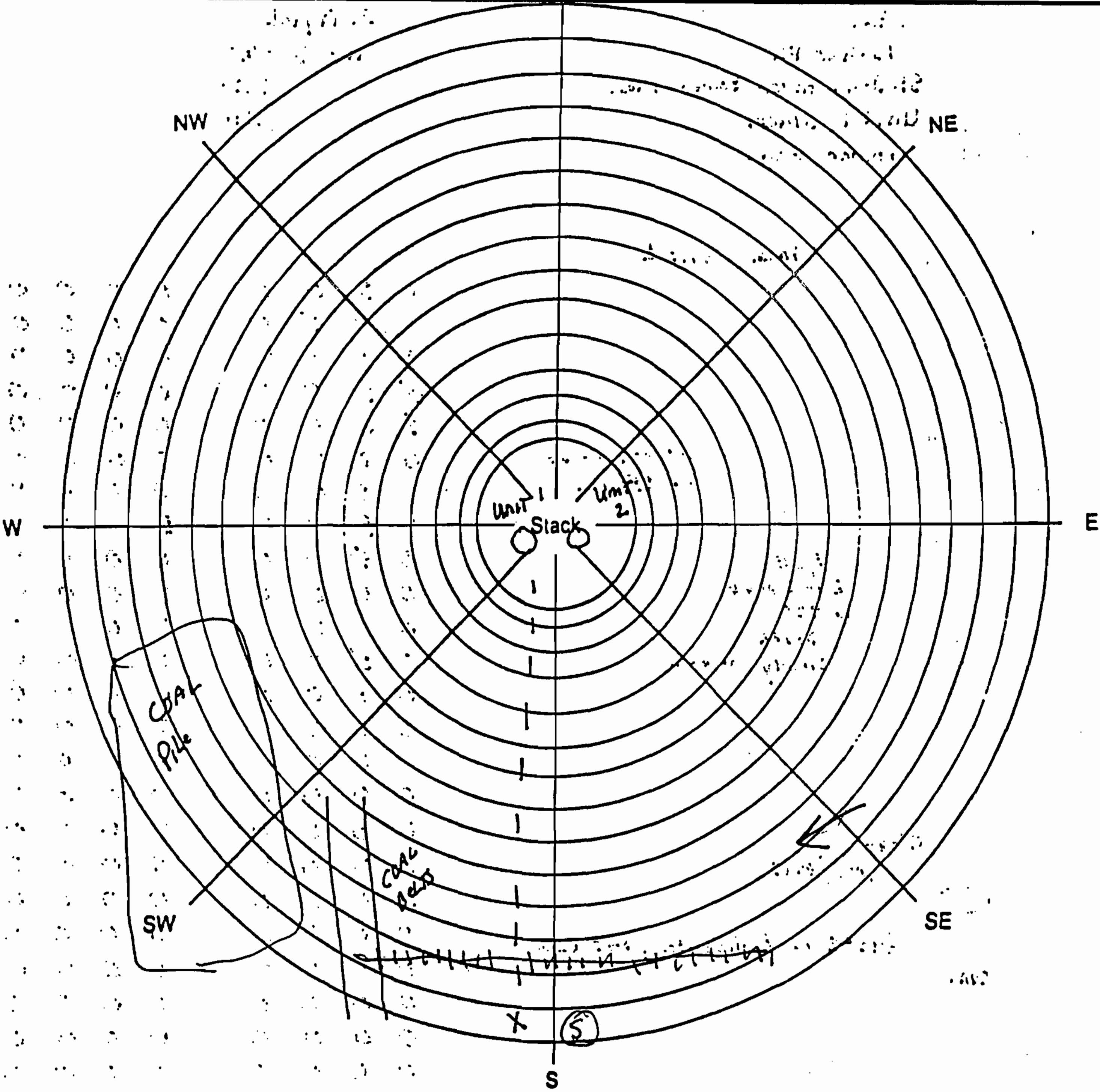
Examination Passed in EPA Region
Jacksonville, FL.

Min.	0	15	30	45	Min.	0	15	30	45
0	0	5	0	0	30	0	0	0	0
1	0	0	5	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	5	5	0	0	33	0	0	0	0
4	5	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	5	0	0	37	5	0	0	0
8	0	5	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	5	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
	Avg. % = .3333					Avg. % = .0416			

*If wet, distance (ft.) from plume outlet to point in plume where observations made

Avg. % = .1875

TSA



LOCATE THE FOLLOWING ON THE DIAGRAM

1. The stack configuration with the stack under observation in the center
2. Observer's position using X to indicate position.
3. Arrow pointing direction wind is blowing.
4. Dotted line between observer and plume indicating observers line of sight when making readings.
5. Circle with S in center to indicate sun location.
6. Any large structures or significant topographical features.

NOTE: Stack configuration is not proportional to distances in feet from stack in the diagram:

Visible Emissions Evaluation Data Sheet

Client: JEA
Observer: J. Tayfel
Project No.: 95-420 FL
Date: 11-7-95
Plant Name: St. John River Power Park
Observation began: 1115
Location: Unit 2 Stack
ended: 1215
Type of Facility: Power Gen.

Source Identification (Stack, Duct, etc.): Unit 2 Stack

Observer Location
(Diagram on back of sheet)
Distance from Observer to source: ~1500ft
Height of Source (above ground): ~500 ft.

Weather Conditions
Wind Direction: out of W
Wind Speed: 2 to 5 mph
Temperature: ~80°
Position of Sun:
Sky Condition (clear, overcast, %clouds, color of clouds, etc.): Partly Cloudy

Plume Description
Color: wht
Background: BLUE
Type (wet or dry): Dist.

Comments: Run 2 of Particulate Soot Blow Run

Observers Signature: James Tayfel

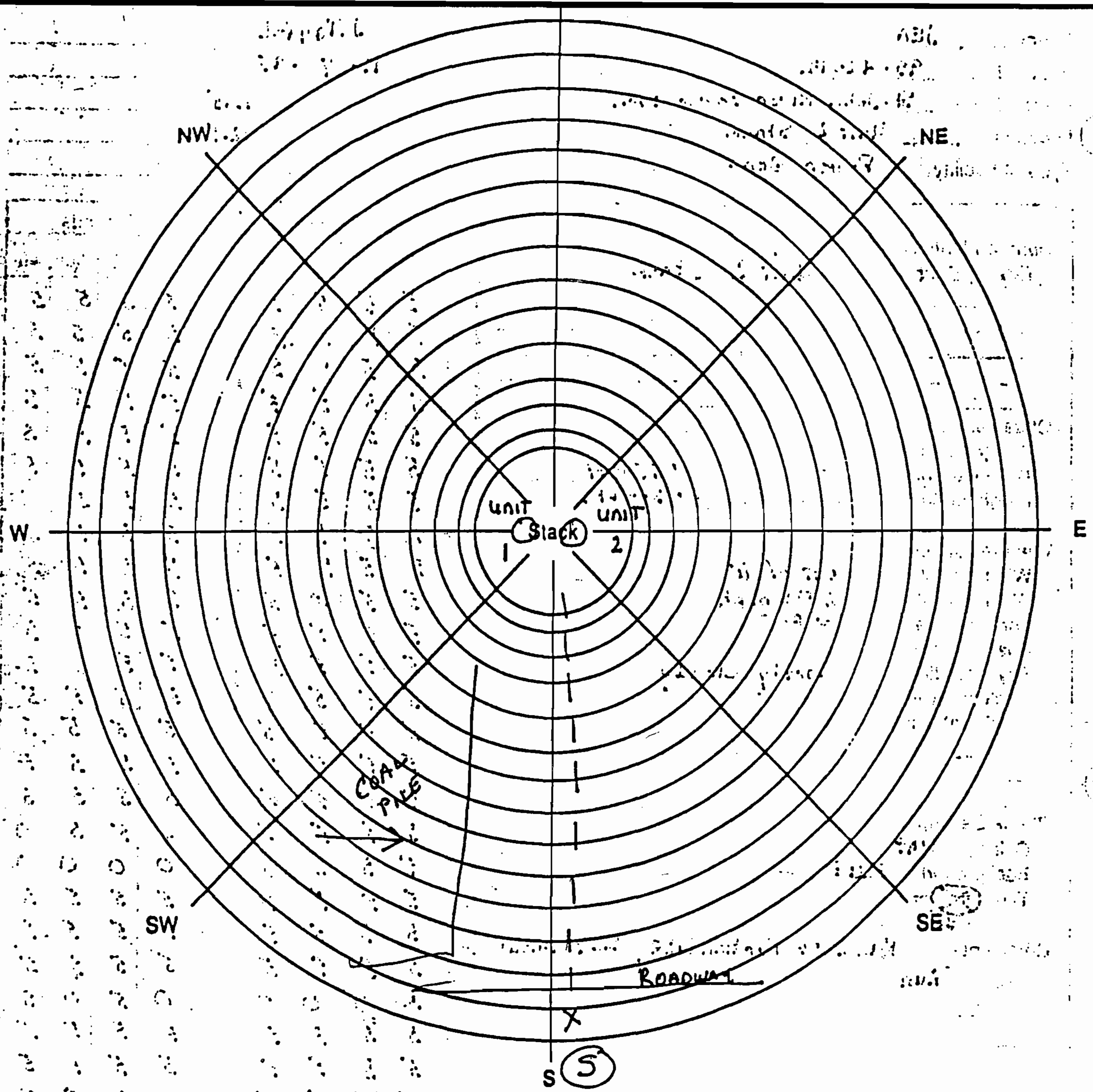
Date of Last EPA Method 9 Examination: July 7, 1995

Examination Passed in EPA Region: Jacksonville, FL

Min.	0	15	30	45	Min.	0	15	30	45
0	5	5	5	5	30	5	5	5	5
1	5	5	5	5	31	5	5	5	5
2	5	5	5	5	32	5	5	5	5
3	5	5	5	5	33	5	5	5	5
4	5	5	5	5	34	5	5	5	5
5	5	5	5	5	35	5	5	5	5
6	5	5	5	5	36	5	5	5	0
7	10	5	5	5	37	5	5	5	5
8	5	5	5	5	38	5	5	5	5
9	5	5	10	5	39	5	5	5	5
10	5	5	5	5	40	5	5	0	5
11	5	5	5	5	41	5	5	5	5
12	5	5	5	0	42	5	5	5	5
13	5	5	5	5	43	5	5	5	5
14	5	5	5	5	44	5	5	5	5
15	5	5	5	5	45	5	5	5	5
16	5	5	5	5	46	5	5	5	0
17	5	5	5	5	47	0	0	0	0
18	5	5	5	5	48	5	5	5	5
19	5	5	5	5	49	5	5	5	5
20	5	5	5	5	50	5	5	5	5
21	5	0	0	0	51	0	5	0	5
22	5	5	5	5	52	5	5	5	5
23	5	5	5	5	53	5	5	5	5
24	5	5	5	5	54	5	5	5	5
25	0	0	5	5	55	5	5	5	5
26	5	0	0	5	56	5	5	5	5
27	5	5	5	5	57	5	0	5	5
28	5	5	5	5	58	5	5	5	5
29	5	5	5	5	59	5	5	5	5
	Avg.% = 4.75					Avg.% = 4.58			

Avg.% = 4.67

*If wet, distance (ft.) from plume outlet to point in plume where observations made



LOCATE THE FOLLOWING ON THE DIAGRAM

1. The stack configuration with the stack under observation in the center
2. Observer's position using X to indicate position.
3. Arrow pointing direction wind is blowing.
4. Dotted line between observer and plume indicating observers line of sight when making readings.
5. Circle with S in center to indicate sun location.
6. Any large structures or significant topographical features.

NOTE: Stack configuration is not proportional to distances in feet from stack in the diagram.

F16

Total Source Analysis, Inc.
Environ... Testing Consultants

Visible Emissions Evaluation Data Sheet

Client: JEA
Project No.: 95-420 FL
Plant Name: St. John River Power Park
Location: Limestone Silo
Type of Facility: Power Gen.

Observer: J. Tayfel
Date: 11-7-95
Observation began: 1430
ended: 1530

Source Identification (Stack, Duct, etc.): SILOS AND STACKS

Observer Location (Diagram on back of sheet)
Distance from Observer to source: ~ 450 ft
Height of Source (above ground): ~ 150 ft

Weather Conditions
Wind Direction: out of W
Wind Speed: Temp
Temperature: ~ 84°
Position of Sun: out of SW
Sky Condition (clear, overcast, %clouds, color of clouds, etc.): SCATTERED CLOUDS

Plume Description
Color: Clear
Background: Blue / Grey
Type (wet or dry): dry
Dist.:

Comments: Normal Operating Conditions

Observers Signature: James Tayfel

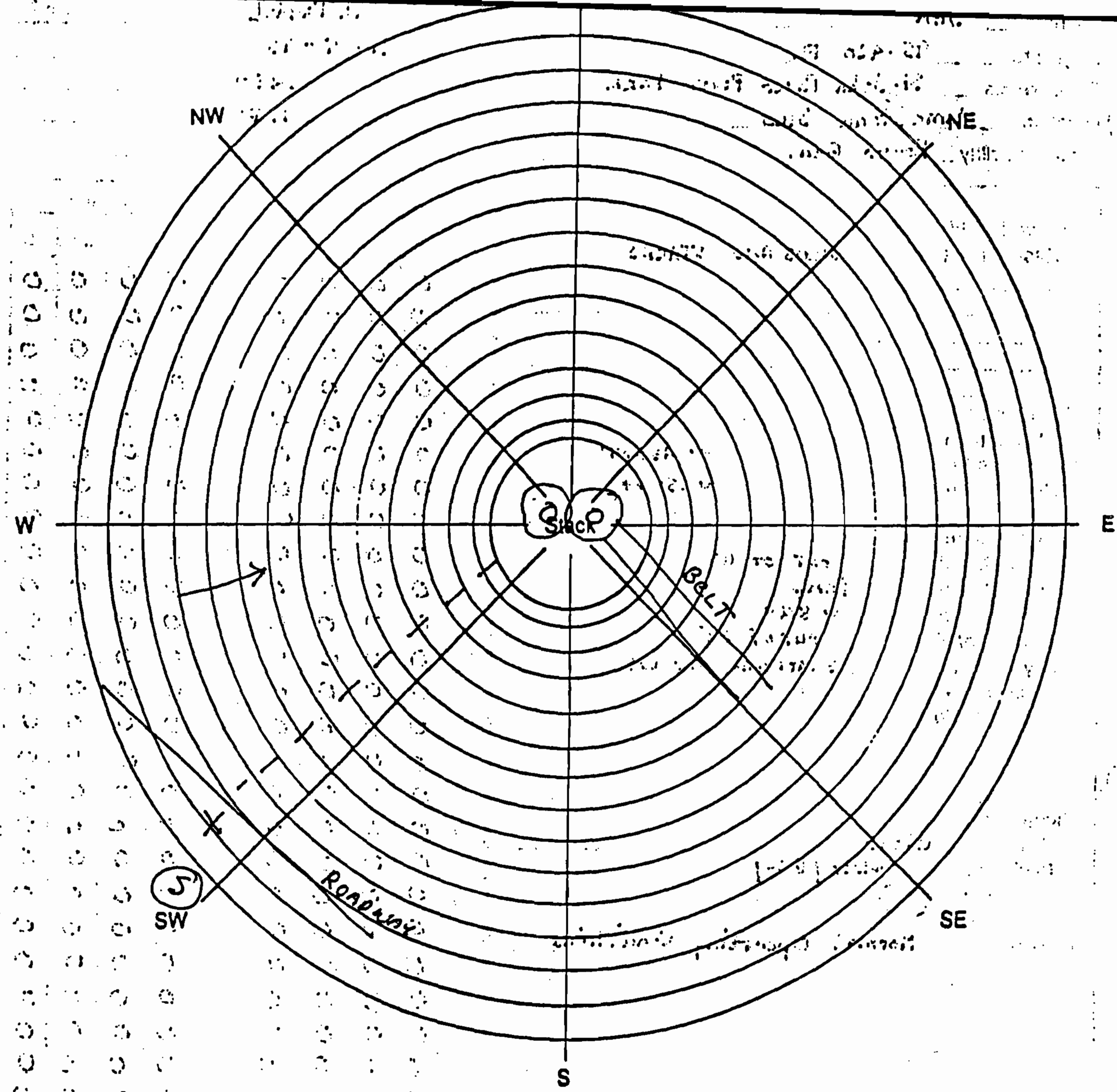
Date of Last EPA Method 9 Examination: July 7, 1995

Examination Passed in EPA Region: Jacksonville, FL.

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

*If wet, distance (ft.) from plume outlet to point in plume where observations made

TSA



LOCATE THE FOLLOWING ON THE DIAGRAM

1. The stack configuration with the stack under observation in the center
2. Observer's position using X to indicate position.
3. Arrow pointing direction wind is blowing.
4. Dotted line between observer and plume indicating observers line of sight when making readings.
5. Circle with S in center to indicate sun location.
6. Any large structures or significant topographical features.

NOTE: Stack configuration is not proportional to distances in feet from stack in the diagram.

TSA
Total Source Analysis, Inc.
Envirom [illegible]sting Consultants

Visible Emissions Evaluation Data Sheet

Client: J.E.A / SJRPP.

Project No.: 95-420-SL

Plant Name: St. Johns River Power Park

Location: Limestone Handling Area.

Type of Facility: Power Generation

Observer: Alvaro Castro

Date: 11/16/95

Observation began: 10:00 am.

ended: 11:00 am.

Source Identification (Stack, Duct, etc.): Limestone Pile (Limestone Handling Area)

Observer Location (Diagram on back of sheet)

Distance from Observer to source: ~ 100 ft.

Height of Source (above ground): ~ 10 ft

Weather Conditions

Wind Direction: N.W.

Wind Speed: ~ 0-5 mph.

Temperature: ~ 66°F R.H. 48%

Position of Sun: SE

Sky Condition (clear, overcast, %clouds, color of clouds, etc.): 20% clouds white clouds.

Plume Description

Color: clear.

Background: Blue / white

Type (wet or dry): dry. Dist.

Comments: Normal operating conditions

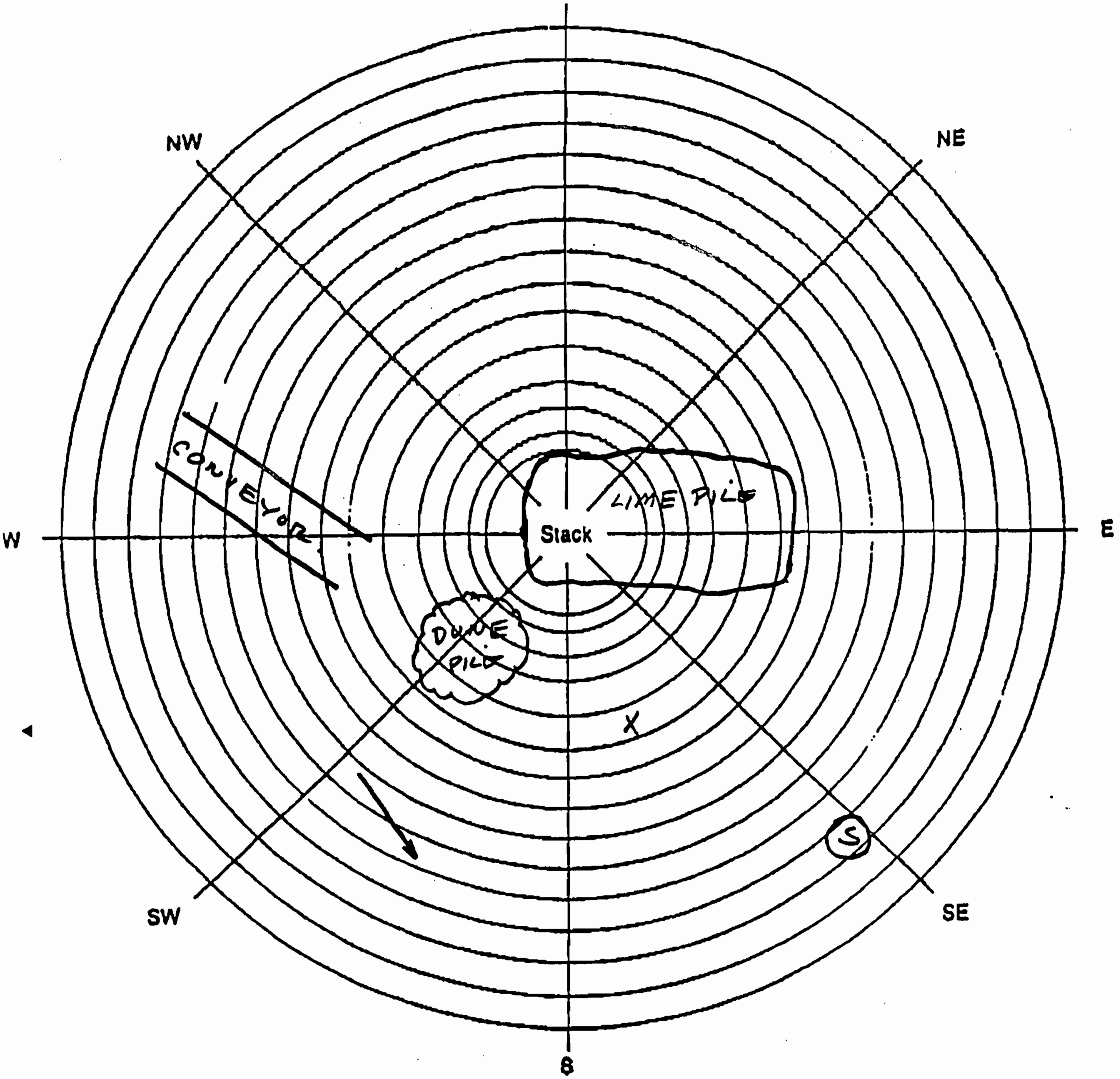
Observers Signature: Alvaro Castro

Date of Last EPA Method 9 Examination: June 8, 1995

Examination Passed in EPA Region: Jacksonville, FL.

Min.	0	15	30	45	Min.	0	15	30	45
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	5
2	5	5	5	5	32	0	5	0	0
3	5	5	0	0	33	0	0	0	0
4	0	0	0	5	34	5	5	5	5
5	5	0	0	0	35	0	0	0	0
6	0	0	0	0	36	5	5	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	5	5	5	5	40	5	5	5	5
11	5	0	0	0	41	5	5	5	5
12	0	0	5	0	42	5	5	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	5	5	5	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	5	5	5	5	48	0	0	5	5
19	5	5	0	0	49	5	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	5	5	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	5	5	5	5
26	0	0	0	0	56	0	0	0	0
27	5	5	5	5	57	0	0	0	0
28	5	0	0	0	58	5	5	5	5
29	0	0	0	0	59	0	0	0	0
	Avg. % = 1.125					Avg. % = 1.333			

*If wet, distance (ft.) from plume outlet to point in plume where observations made



LOCATE THE FOLLOWING ON THE DIAGRAM

1. The stack configuration with the stack under observation in the center
2. Observer's position using X to indicate position.
3. Arrow pointing direction wind is blowing.
4. Dotted line between observer and plume indicating observers line of sight when making readings.
5. Circle with S in center to indicate sun location.
6. Any large structures or significant topographical features.

NOTE: Stack configuration is not proportional to distances in feet from stack in the diagram.

VISIBLE EMISSIONS EVALUATION

This is to certify that

Alonso Castro

did complete a course in the methods of determining opacity of visible emissions from sources as specified by Federal Reference Method 9 conducted by Eastern Technical Associates of Raleigh, North Carolina.

[illegible]

Course Moderator

Jacksonville

Location

June 6, 1995

Date

Best Available Copy

F22

VISIBLE EMISSIONS EVALUATOR

Thi[illegible] that

[illegible]astro

met the specifications of Fe[illegible] 9 and qualified as a visible emissions evaluator. Maxim[illegible]d black smoke did not exceed 7.5% opacity and no sing[illegible] ex[illegible]city was incurred during the certification test conduc[illegible] Eas[illegible]ciates of Raleigh, North Carolina. This certifica[illegible]of issue.

Thomas [illegible]
Presid[illegible]

[illegible]48963
[illegible]ificate Number

[illegible]
[illegible] President

Jacksonville
Location

David B. Savage, Jr.
Program Manager

June 8, 1995
Date of Issue

CONGRATULATIONS,

Here is the wallet card signifying your successful certification at the recent Florida Department of Environmental Regulation Smoke School conducted by Eastern Technical Associates.

Your certificate is valid for six (6) months. To keep your certification current, you must recertify on or before the expiration date on the card.
Please mark your calendar accordingly.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

ALVARO CASTRO, has completed the STATE OF FLORIDA visible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9

THIS CERTIFICATE EXPIRES Dec 8, 1995

CERTIFICATE OFFICER

BEARER'S SIGNATURE

EDWARD HUCK

FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

F23

TSA TEST DATA SHEETS

Client :J.E.A. S.J.R.P.P.
Site :0000
Unit :~~1 AND~~ 2
Project :95-420
Comment : Run # 1 Unit # 1 Stack.
Test Date :11/7/95 Time :08:00 thru 08:25:09 Page

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
08:00:17	377.45	160.23	13.82
08:01:17	374.38	164.43	13.99
08:02:17	377.74	163.32	13.83
08:03:17	375.46	164.26	13.98
08:04:17	380.30	150.12	13.69
08:05:17	374.22	160.36	14.00
08:06:17	375.15	158.05	13.85
08:07:17	384.61	157.12	13.77
08:08:17	373.35	157.80	14.11
08:09:17	365.03	158.66	13.84
08:10:17	377.17	152.76	13.71
08:11:17	375.36	156.19	14.01
08:12:17	374.59	155.51	13.93
08:13:17	377.87	154.91	13.91
08:14:17	381.64	154.29	13.87
08:15:17	374.80	152.25	13.82
08:16:17	379.83	156.04	13.87
08:17:17	373.04	157.42	13.94
08:18:16	374.72	155.56	13.91
08:19:16	372.20	156.68	14.02
08:20:16	372.66	156.18	13.84
08:21:16	375.90	155.63	13.93
08:22:16	367.10	157.21	13.97
08:23:16	375.49	154.41	13.79
08:24:16	379.83	154.38	13.84
08:25:09	375.77	156.63	13.95
Averages for 26 Points	375.60	156.93	13.89

Unit : 1

Best Available Copy

Project : 95-420

Comment : Run 2 stacks

Test Date : 11/7/95 Time : 08:45 thru 09:10:15

Page 1

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
08:45:54	379.97	164.69	13.86
08:46:54	369.31	165.61	14.08
08:47:54	368.95	161.31	13.86
08:48:54	374.44	163.25	14.00
08:49:54	376.96	160.43	13.93
08:50:54	381.61	157.28	13.75
08:51:54	378.63	157.98	13.85
08:52:54	377.05	161.64	14.04
08:53:54	374.13	157.53	13.74
08:54:54	377.38	159.24	13.88
08:55:54	376.68	158.53	13.91
08:56:54	382.74	156.48	13.88
08:57:54	367.69	160.16	14.06
08:58:54	375.70	157.08	13.96
08:59:54	374.89	157.25	13.82
09:00:53	371.38	158.51	13.92
09:01:53	376.24	160.26	13.98
09:02:53	369.00	159.33	13.95
09:03:53	385.38	156.70	13.73
09:04:53	377.15	160.57	14.07
09:05:53	378.97	155.73	13.93
09:06:53	377.50	158.93	13.96
09:07:53	380.62	158.84	13.99
09:08:53	377.32	153.89	13.77
09:09:53	377.65	154.44	13.77
09:10:15	377.10	154.19	13.76
Averages for 26 Points	376.32	158.84	13.90

Client :J.E.A. S.J.R.P.P.
Site :0000
Unit :1 ~~AND 2~~
Project :95-420
Comment : Run #3 Stack.
Test Date :11/7/95 Time :09:30 thru 09:55:02 Page

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
09:30:47	371.72	158.99	13.81
09:31:47	376.09	157.64	13.73
09:32:47	372.13	161.29	13.88
09:33:47	376.29	160.56	13.87
09:34:47	371.01	160.40	13.95
09:35:47	375.66	159.72	13.90
09:36:47	367.94	160.32	13.90
09:37:46	376.55	158.55	13.86
09:38:46	381.79	156.40	13.69
09:39:46	369.55	158.18	13.96
09:40:46	369.84	156.62	13.87
09:41:46	369.31	157.91	13.89
09:42:46	373.67	154.43	13.76
09:43:46	374.08	157.45	13.93
09:44:46	372.09	161.12	14.10
09:45:46	380.77	158.06	13.80
09:46:46	377.04	157.86	13.89
09:47:46	372.65	159.49	13.96
09:48:46	373.60	156.69	13.86
09:49:46	376.69	159.82	13.90
09:50:46	369.28	162.59	14.19
09:51:46	379.31	156.79	13.79
09:52:46	379.03	158.37	13.86
09:53:46	376.20	158.06	14.00
09:54:46	373.03	156.71	13.75
09:55:02	374.44	155.36	13.71
Averages for 26 Points	374.22	158.43	13.87

Unit :1 ~~AND~~ 2
Project :95-420
Comment : Run# 4 Stack
Test Date :11/7/95 Time :10:25 thru 10:50:02

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Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
10:25:41	367.45	152.51	14.01
10:26:41	372.79	151.95	13.88
10:27:41	376.63	148.49	13.82
10:28:41	373.55	151.01	14.05
10:29:41	366.93	154.60	14.03
10:30:41	369.94	152.30	13.93
10:31:41	372.77	149.67	13.81
10:32:40	367.43	146.90	13.80
10:33:40	372.61	151.28	13.97
10:34:40	366.55	151.11	13.89
10:35:40	377.11	148.24	14.00
10:36:40	362.03	152.73	13.94
10:37:40	380.05	147.74	13.68
10:38:40	380.51	149.32	13.97
10:39:40	379.85	154.16	14.01
10:40:40	381.86	148.49	13.66
10:41:40	369.97	149.30	13.93
10:42:40	375.66	150.43	13.83
10:43:40	371.85	157.00	14.17
10:44:40	371.25	153.51	13.81
10:45:40	372.29	155.05	13.93
10:46:40	366.00	156.63	13.90
10:47:40	374.96	154.74	13.89
10:48:40	367.87	155.50	13.95
10:49:40	366.76	153.51	13.83
10:50:02	372.39	153.17	13.83
Averages for 26 Points	372.19	151.89	13.90

Client :J.E.A. S.J.R.P.P.
Site :0000
Unit :1 ~~AND 2~~
Project :95-420
Comment : Run #5 Stack
Test Date :11/7/95 Time :11:05 thru 11:30:07 Page

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
11:05:55	384.98	159.60	14.06
11:06:55	393.39	156.61	14.08
11:07:55	385.98	153.80	13.91
11:08:55	395.89	148.94	13.56
11:09:55	389.20	153.49	14.01
11:10:55	382.13	155.12	14.07
11:11:55	382.80	152.87	13.90
11:12:55	394.07	154.06	13.97
11:13:55	395.35	152.50	13.98
11:14:55	386.70	153.10	13.94
11:15:55	391.61	153.49	13.98
11:16:55	396.69	152.58	13.80
11:17:55	393.38	153.34	13.93
11:18:54	387.82	153.44	13.87
11:19:54	385.20	151.95	13.86
11:20:54	386.01	156.30	14.03
11:21:54	383.96	150.45	13.73
11:22:54	390.08	152.08	13.83
11:23:54	385.92	155.18	14.01
11:24:54	382.66	156.66	14.09
11:25:54	389.69	153.78	13.98
11:26:54	381.93	155.57	14.07
11:27:54	380.50	152.09	13.76
11:28:54	391.06	149.90	13.80
11:29:54	387.39	152.27	14.00
11:30:07	387.16	151.10	13.87
Averages for 26 Points	388.13	153.47	13.92

Unit :1 ~~AND 2~~
Project :95-420
Comment : Run# 6 Stack
Test Date :11/7/95 Time :11:45 thru 12:10:02

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Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
11:45:26	364.28	156.82	14.12
11:46:26	374.96	152.96	13.87
11:47:26	382.98	152.78	13.74
11:48:26	383.68	155.08	13.98
11:49:26	383.24	153.65	13.95
11:50:26	378.05	155.42	13.91
11:51:26	381.36	150.15	13.74
11:52:26	387.14	152.17	13.99
11:53:26	385.48	154.17	13.91
11:54:26	400.77	150.69	13.91
11:55:26	394.79	152.81	14.02
11:56:26	397.46	147.79	13.63
11:57:25	384.53	153.87	14.00
11:58:25	388.01	150.87	13.91
11:59:25	382.51	153.98	14.10
12:00:25	395.87	148.78	13.63
12:01:25	392.88	152.78	13.99
12:02:25	385.71	151.54	13.92
12:03:25	394.48	152.46	13.95
12:04:25	384.80	154.19	14.02
12:05:25	386.51	151.96	13.89
12:06:25	389.22	150.87	13.93
12:07:25	384.84	151.76	13.97
12:08:25	400.04	148.01	13.79
12:09:25	391.65	152.50	14.00
12:10:02	388.47	152.76	14.12
Averages for 26 Points	387.06	152.33	13.92

Client :J.E.A. S.J.R.P.P.
Site :0000
Unit :1 ~~AND 2~~
Project :95-420
Comment : Run# 7 Stack
Test Date :11/7/95 Time :12:25 thru 12:50:05

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Page

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
12:25:19	383.53	153.18	13.96
12:26:19	392.77	145.15	13.56
12:27:19	390.53	150.85	13.95
12:28:19	384.32	147.53	13.81
12:29:19	390.70	149.09	13.85
12:30:19	389.30	149.75	13.88
12:31:19	390.32	150.87	13.98
12:32:19	392.31	149.03	13.92
12:33:19	380.38	147.14	13.78
12:34:19	380.37	149.39	13.95
12:35:19	386.58	150.42	13.99
12:36:19	387.07	148.22	13.88
12:37:18	383.59	147.70	13.94
12:38:18	386.92	144.72	13.70
12:39:18	386.29	147.25	14.00
12:40:18	383.21	151.30	14.16
12:41:18	373.74	145.32	13.66
12:42:18	370.96	149.65	13.87
12:43:18	373.57	150.99	14.06
12:44:18	375.23	150.23	13.84
12:45:18	378.10	148.46	13.87
12:46:18	384.92	148.08	13.79
12:47:18	377.36	149.69	13.92
12:48:18	380.14	149.86	13.88
12:49:18	376.90	149.29	13.80
12:50:05	379.68	150.66	13.86
Averages for 26 Points	383.03	148.99	13.87

Unit :1 AND 2
Project :95-420
Comment : Run 8 Stack
Test Date :11/7/95 Time :13:00 thru 13:25

Best Available Copy

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
13:00:53	371.95	150.36	13.88
13:01:53	373.16	146.64	13.77
13:02:53	372.94	155.48	13.90
13:03:53	372.46	165.25	13.93
13:04:53	362.09	167.85	14.07
13:05:53	368.16	165.50	13.92
13:06:53	369.41	171.21	14.18
13:07:53	364.85	167.17	13.88
13:08:53	367.16	168.53	14.07
13:09:53	365.90	169.95	13.99
13:10:53	369.18	163.74	13.73
13:11:53	371.25	164.05	13.92
13:12:53	369.79	167.35	13.96
13:13:53	371.02	168.09	14.09
13:14:53	373.55	167.18	13.95
13:15:53	372.65	168.52	13.95
13:16:53	368.29	167.54	13.85
13:17:53	371.21	168.74	13.83
13:18:52	373.46	169.53	13.97
13:19:52	376.90	170.21	13.87
13:20:52	377.22	169.98	13.91
13:21:52	374.96	176.64	14.31
13:22:52	365.86	175.59	14.23
13:23:52	373.80	171.92	13.86
13:24:52	369.97	176.00	14.15
Averages for 25 Points	370.68	166.92	13.96

Client :J.E.A. S.J.R.P.P.
Site :0000
Unit :1 ~~AND~~ 2
Project :95-420
Comment : Run #-9 stack,
Test Date :11/7/95 Time :13:45 thru 14:10:00 Page

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
13:45:04	379.05	137.47	13.72
13:46:04	373.07	141.97	13.95
13:47:04	360.57	145.09	14.19
13:48:04	378.08	139.19	13.76
13:49:04	377.23	146.91	14.13
13:50:04	373.26	143.48	13.81
13:51:04	380.49	141.86	13.88
13:52:04	372.57	143.83	13.83
13:53:04	380.41	144.27	13.88
13:54:03	371.41	144.09	14.09
13:55:03	374.83	145.06	14.00
13:56:03	369.05	138.26	13.90
13:57:03	377.35	141.00	13.71
13:58:03	371.43	145.19	14.02
13:59:03	372.60	143.03	13.84
14:00:03	365.03	145.57	13.99
14:01:03	370.70	145.66	14.14
14:02:03	375.93	145.06	13.96
14:03:03	368.93	146.73	13.98
14:04:03	373.55	142.06	13.84
14:05:03	370.85	144.23	13.84
14:06:03	374.83	145.36	14.07
14:07:03	374.01	145.68	13.99
14:08:03	381.01	143.31	13.82
14:09:03	383.19	144.69	14.05
14:10:00	375.68	146.63	14.09
Averages for 26 Points	374.04	143.68	13.94

Unit :1 AND 2
Project :95-420
Comment : Run # 10 Stack.
Test Date :11/7/95 Time :14:22 thru 14:47

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
14:22:59	378.99	153.28	13.72
14:23:59	369.34	149.50	13.73
14:24:59	368.24	153.82	13.94
14:25:59	376.83	152.19	13.90
14:26:59	374.39	152.10	13.88
14:27:59	365.29	153.13	14.08
14:28:59	365.47	148.98	13.72
14:29:59	372.56	145.95	13.70
14:30:59	361.63	149.83	13.93
14:31:59	370.04	138.67	13.52
14:32:59	364.11	142.11	13.94
14:33:59	367.65	144.05	13.99
14:34:59	375.87	139.76	13.75
14:35:59	368.45	142.31	14.12
14:36:59	367.48	140.23	13.85
14:37:59	367.14	134.63	13.69
14:38:59	360.42	133.90	13.72
14:39:59	368.74	136.25	13.84
14:40:59	366.89	134.46	13.83
14:41:59	369.05	140.52	14.12
14:42:59	379.48	133.47	13.59
14:43:59	371.20	135.64	13.87
14:44:59	380.47	137.03	13.93
14:45:58	376.39	138.41	13.84
14:46:58	377.25	137.97	13.87
Averages for 25 Points	370.53	142.72	13.84

Client :J.E.A. S.J.R.P.P.
Site :0000
Unit :1 ~~AND 2~~
Project :95-420
Comment : Run # 11. stack
Test Date :11/7/95 Time :15:00 thru 15:25

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Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
15:00:38	363.61	138.04	13.92
15:01:38	373.10	137.03	13.66
15:02:38	370.05	132.57	13.59
15:03:38	359.14	137.29	14.02
15:04:38	365.72	135.72	13.81
15:05:38	367.38	136.74	13.79
15:06:38	373.77	135.73	13.78
15:07:38	363.35	143.61	14.14
15:08:38	365.10	137.46	13.77
15:09:38	359.14	138.00	13.93
15:10:38	351.09	139.82	14.14
15:11:38	351.87	140.49	13.88
15:12:38	360.18	136.62	13.68
15:13:38	361.35	138.10	13.86
15:14:38	357.79	139.10	13.91
15:15:38	364.98	139.69	13.95
15:16:37	355.69	138.66	13.72
15:17:37	362.71	142.40	14.00
15:18:37	365.79	140.34	13.75
15:19:37	360.30	141.39	13.82
15:20:37	351.30	142.32	13.94
15:21:37	362.40	141.79	13.83
15:22:37	358.18	145.13	14.00
15:23:37	355.15	145.58	13.87
15:24:37	355.07	143.34	13.77
Averages for 25 Points	361.36	139.47	13.86

Client :J.E.A. S.J.R.P.P.
Site :0000
Unit :~~1 AND~~ 2
Project :95-420
Comment : Run #1 Stack
Test Date :11/6/95 Time :08:35 thru 09:00:24

Time	1032 NOX PPm	1031 SO2 PPm	1030 O2 %	1029 CO2 %
08:35:08	356.08	246.05	5.45	13.88
08:36:08	349.70	243.39	5.32	13.62
08:37:08	356.87	245.17	5.49	13.84
08:38:08	362.22	247.44	5.21	13.72
08:39:08	351.42	239.69	5.82	13.41
08:40:08	346.29	249.42	5.23	13.92
08:41:07	350.73	245.85	5.57	13.61
08:42:07	348.41	251.91	5.44	13.81
08:43:07	357.08	250.08	5.32	13.72
08:44:07	377.24	243.47	5.78	13.42
08:45:07	362.99	246.65	5.52	13.72
08:46:07	353.31	243.83	5.57	13.60
08:47:07	362.18	245.91	5.61	13.69
08:48:07	372.38	249.25	5.29	13.74
08:49:07	362.10	248.43	5.67	13.72
08:50:07	363.32	246.73	5.49	13.60
08:51:07	369.65	242.02	5.76	13.48
08:52:07	363.18	256.66	5.20	14.08
08:53:07	364.20	243.03	5.82	13.26
08:54:07	367.08	251.31	5.38	14.03
08:55:07	363.86	242.04	5.58	13.49
08:56:07	363.81	245.14	5.54	13.78
08:57:07	367.10	246.13	5.42	13.75
08:58:07	368.50	245.72	5.67	13.61
08:59:07	370.34	247.72	5.51	13.62
09:00:07	368.01	255.23	5.51	13.90
09:00:24	359.05	259.95	5.31	14.04
Averages for 27 Points	361.37	247.34	5.49	13.70

Project :95-420
Comment : Run# 2 Stack

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Test Date :11/6/95 Time :09:14 thru 09:39

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
09:14:00	402.61	243.69	13.44
09:15:00	387.02	247.01	13.70
09:16:00	392.16	250.49	13.81
09:17:00	394.08	238.64	13.38
09:18:00	385.56	246.29	13.71
09:19:00	394.01	249.99	13.76
09:20:00	399.06	250.46	13.65
09:21:00	393.41	253.20	13.86
09:22:00	384.39	249.97	13.57
09:23:00	400.16	259.86	13.96
09:24:00	392.77	243.44	13.39
09:25:00	397.82	250.57	13.84
09:26:00	395.37	243.77	13.50
09:27:00	374.25	254.30	13.91
09:28:00	371.45	254.16	13.75
09:29:00	378.88	257.73	13.95
09:30:00	395.71	248.10	13.59
09:31:00	399.32	247.64	13.66
09:32:00	395.89	251.89	13.74
09:33:00	386.44	248.54	13.54
09:34:00	377.92	259.07	14.12
09:35:00	403.92	245.20	13.56
09:36:00	401.29	244.65	13.68
09:37:00	390.03	247.42	13.71
09:38:00	384.77	249.17	13.68
09:38:59	379.39	248.73	13.79
Averages for 26 Points	390.68	249.38	13.70

Client :J.E.A. S.J.R.P.P.
Site :0000
Unit :1 AND 2
Project :95-420
Comment : Run # 3 Stack
Test Date :11/6/95 Time :09:55 thru 10:20:05

	1032	1031	1029
	NOX	SO2	CO2
Time	PPm	PPm	%
09:55:38	385.67	242.29	13.38
09:56:38	381.12	246.21	13.66
09:57:38	376.44	248.98	13.62
09:58:38	375.56	252.02	13.62
09:59:38	375.73	259.29	13.79
10:00:38	378.56	256.00	13.76
10:01:38	401.57	255.51	13.71
10:02:38	398.67	248.40	13.54
10:03:38	402.35	259.18	13.82
10:04:38	392.23	250.98	13.49
10:05:37	377.16	255.18	13.88
10:06:37	388.36	250.05	13.55
10:07:37	384.73	251.86	13.78
10:08:37	372.25	253.12	13.71
10:09:37	380.14	248.32	13.62
10:10:37	374.34	261.05	13.99
10:11:37	394.50	244.42	13.38
10:12:37	377.50	258.44	13.92
10:13:37	381.72	257.07	13.70
10:14:37	380.92	256.17	13.85
10:15:37	394.54	249.75	13.62
10:16:37	388.57	248.62	13.59
10:17:37	393.12	255.73	13.81
10:18:37	397.01	254.99	13.69
10:19:37	398.38	255.37	13.75
10:20:05	397.80	249.25	13.75
Averages for 26 Points	386.49	252.62	13.69

Site :0000
Unit :[redacted] 2
Project :95-420
Comment : Run #4 Stack
Test Date :11/6/95 Time :10:37 thru 11:02:09

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Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
10:37:27	377.80	253.51	13.64
10:38:27	386.38	267.34	14.08
10:39:27	377.07	247.77	13.59
10:40:27	380.21	245.85	13.55
10:41:27	369.56	253.01	13.85
10:42:27	383.13	247.74	13.66
10:43:27	387.57	248.32	13.62
10:44:27	380.16	253.10	13.80
10:45:27	375.55	254.11	13.86
10:46:27	383.20	247.55	13.64
10:47:27	388.73	253.12	13.80
10:48:27	381.61	250.05	13.65
10:49:27	382.87	254.74	13.82
10:50:27	385.74	252.32	13.76
10:51:27	389.87	252.77	13.62
10:52:27	387.37	252.00	13.81
10:53:27	402.13	247.19	13.53
10:54:27	391.95	248.35	13.71
10:55:27	393.80	243.57	13.63
10:56:27	406.16	247.14	13.82
10:57:27	404.20	243.76	13.59
10:58:27	397.02	255.21	14.03
10:59:27	398.72	250.08	13.59
11:00:26	392.78	258.36	13.90
11:01:26	385.80	249.99	13.67
11:02:09	401.84	252.13	13.60
Averages for 26 Points	388.12	251.11	13.72

Client :J.E.A. S.J.R.P.P.
Site :0000
Unit :~~1 AND~~ 2
Project :95-420
Comment : Run #5
Test Date :11/6/95 Time :11:20 thru 11:45 Page

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
11:20:46	407.97	241.13	13.37
11:21:46	392.85	266.49	14.05
11:22:46	394.43	249.83	13.34
11:23:46	385.32	253.40	13.66
11:24:46	376.67	253.34	13.73
11:25:46	388.98	254.22	13.82
11:26:46	398.61	251.06	13.60
11:27:46	396.33	248.70	13.53
11:28:45	393.53	248.95	13.41
11:29:45	373.42	264.90	13.92
11:30:45	376.76	256.36	13.63
11:31:45	389.21	255.54	13.60
11:32:45	393.97	253.73	13.55
11:33:45	394.49	249.80	13.37
11:34:45	385.15	258.15	13.90
11:35:45	391.49	244.04	13.29
11:36:45	386.99	255.46	13.76
11:37:45	377.23	259.82	13.81
11:38:45	391.38	250.84	13.48
11:39:45	399.94	253.62	13.70
11:40:45	406.57	253.51	13.67
11:41:45	392.46	252.00	13.62
11:42:45	379.07	262.90	13.87
11:43:45	394.06	252.19	13.42
11:44:45	387.42	258.09	13.72
Averages for 25 Points	390.17	253.92	13.63

Project :95-420
Comment : Unit #2 Run #6 **Best Available Copy**
Test Date :11/6/95 Time :12:00 thru 12:25:11 Page :

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
12:00:48	394.14	258.37	13.60
12:01:48	391.67	259.53	13.68
12:02:48	389.17	255.24	13.48
12:03:48	381.57	261.72	13.74
12:04:48	384.64	247.63	13.63
12:05:48	385.66	252.41	13.51
12:06:48	386.49	259.31	13.79
12:07:48	386.24	254.17	13.49
12:08:48	393.77	263.51	13.94
12:09:48	392.46	253.95	13.57
12:10:48	398.43	256.94	13.76
12:11:48	398.78	248.57	13.32
12:12:48	394.20	262.90	13.86
12:13:48	390.75	262.14	13.75
12:14:48	401.40	253.62	13.42
12:15:48	390.16	264.45	13.97
12:16:47	398.73	256.04	13.59
12:17:47	397.66	253.59	13.58
12:18:47	383.82	263.38	13.92
12:19:47	396.36	252.99	13.42
12:20:47	388.92	261.31	13.81
12:21:47	386.10	253.26	13.43
12:22:47	382.88	261.89	13.85
12:23:47	398.24	254.94	13.63
12:24:47	387.86	249.69	13.58
12:25:11	384.94	254.25	13.74
Averages for 26 Points	390.96	256.76	13.65

Client :J.E.A. S.J.R.P.P.
Site :0000
Unit : ~~1 AND~~ 2
Project :95-420
Comment : Run #7 Stack
Test Date :11/6/95 Time :12:45 thru 13:10 Page

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
12:45:12	385.95	242.58	13.64
12:46:12	380.25	244.31	13.51
12:47:12	383.89	241.01	13.43
12:48:12	381.20	244.12	13.64
12:49:12	384.48	240.08	13.41
12:50:12	379.81	246.34	13.68
12:51:12	368.09	242.99	13.50
12:52:12	371.74	241.04	13.48
12:53:12	369.02	251.45	13.93
12:54:12	382.15	239.34	13.46
12:55:12	378.74	238.71	13.54
12:56:12	368.13	240.82	13.75
12:57:12	379.07	239.20	13.76
12:58:12	383.33	238.62	13.60
12:59:12	376.77	244.80	13.78
13:00:12	374.79	235.19	13.20
13:01:12	375.15	243.32	13.66
13:02:12	384.93	249.91	13.90
13:03:12	385.05	244.72	13.65
13:04:11	379.86	244.94	13.55
13:05:11	371.42	245.82	13.81
13:06:11	380.15	241.13	13.47
13:07:11	373.44	239.23	13.40
13:08:11	373.49	241.57	13.52
13:09:11	368.96	236.82	13.33
Averages for 25 Points	377.59	242.32	13.58

Unit :~~1 AND~~ 2
Project :95-420
Comment : Unit#2 Run#8
Test Date :11/6/95 Time :13:25 thru 13:50:04

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Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
13:25:57	379.22	237.67	13.30
13:26:57	374.34	245.88	13.73
13:27:57	382.50	232.76	13.20
13:28:57	372.42	250.63	13.85
13:29:57	372.85	245.58	13.40
13:30:57	380.26	247.00	13.59
13:31:57	391.78	248.59	13.66
13:32:57	380.44	241.95	13.35
13:33:57	366.98	249.17	13.81
13:34:57	371.00	241.82	13.35
13:35:57	373.43	249.77	13.78
13:36:57	374.26	247.17	13.54
13:37:57	378.90	245.27	13.62
13:38:57	376.73	250.90	13.65
13:39:56	376.81	242.45	13.38
13:40:56	373.70	243.82	13.55
13:41:56	368.83	249.31	13.72
13:42:56	372.57	243.93	13.47
13:43:56	376.04	251.89	13.71
13:44:56	379.44	249.55	13.76
13:45:56	387.79	239.48	13.24
13:46:56	373.29	251.64	13.88
13:47:56	361.04	243.71	13.42
13:48:56	373.49	245.05	13.56
13:49:56	365.83	249.28	13.66
13:50:04	366.44	249.03	13.68
Averages for 26 Points	375.01	245.89	13.57

Client :J.E.A. S.J.R.P.P.
Site :0000
Unit :~~1 AND~~ 2
Project :95-420
Comment : Run# a Stack
Test Date :11/6/95 Time :14:05 thru 14:35

Time	1032 NOX PPm	1031 SO2 PPm	1029 CO2 %
14:05:06	369.77	249.55	13.76
14:06:06	381.47	235.64	13.29
14:07:06	361.44	254.19	14.04
14:08:06	376.94	239.84	13.42
14:09:06	382.98	242.01	13.79
14:10:06	378.04	243.66	13.64
14:11:06	374.17	241.16	13.59
14:12:06	364.46	245.63	13.72
14:13:06	372.86	247.11	13.68
14:14:06	378.20	249.69	13.57
14:15:06	376.66	246.35	13.66
14:16:06	367.06	254.66	13.86
14:17:06	383.47	242.28	13.34
14:18:06	373.40	256.96	13.89
14:19:06	377.52	247.00	13.46
14:20:06	377.70	249.69	13.60
14:21:06	369.81	247.91	13.53
14:22:06	374.67	257.32	13.87
14:23:06	385.48	252.65	13.59
14:24:06	376.04	250.27	13.64
14:25:06	374.96	247.55	13.61
14:26:06	374.83	248.95	13.80
14:27:06	375.11	246.78	13.54
14:28:06	369.76	249.45	13.72
14:29:05	370.37	252.96	13.69
14:30:05	389.57	251.64	13.67
14:31:05	387.12	247.00	13.52
14:32:05	366.78	251.97	13.75
14:33:05	382.83	252.93	13.78
14:34:05	380.01	251.53	13.74
Averages for 30 Points	375.78	248.47	13.65

Unit :~~1 AND~~ 2
Project :95-420
Comment : Run #10 stack

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Test Date :11/6/95 Time :14:50 thru 15:15

Page

	1032	1031	1029
	NOX	SO2	CO2
Time	PPm	PPm	%
14:50:38	382.82	249.72	13.80
14:51:38	390.12	245.66	13.52
14:52:38	377.43	241.08	13.43
14:53:38	366.41	250.02	13.83
14:54:38	366.38	248.48	13.84
14:55:38	385.62	240.48	13.52
14:56:38	378.27	240.09	13.59
14:57:38	376.84	243.99	13.84
14:58:38	393.07	242.34	13.52
14:59:38	377.60	247.06	13.79
15:00:38	372.14	250.79	13.80
15:01:38	377.08	245.96	13.64
15:02:38	376.12	247.99	13.77
15:03:38	384.72	243.93	13.58
15:04:38	384.75	246.13	13.71
15:05:38	376.15	249.20	13.73
15:06:38	375.99	240.83	13.50
15:07:38	360.91	252.38	14.03
15:08:38	373.93	241.55	13.47
15:09:38	363.75	243.77	13.75
15:10:38	355.00	250.79	13.88
15:11:38	372.14	242.59	13.51
15:12:38	385.25	243.60	13.75
15:13:38	389.89	248.16	13.75
15:14:37	378.06	241.30	13.48
Averages for 25 Points	376.81	245.51	13.68

TSA CALIBRATION DATA

INITIAL ANALYZER CALIBRATION DATA

CLIENT JEA SJRPP PROJECT#: 95-420-FL TEST DATE 11/6/95

SOURCE IDENTIFICATION JACKSONVILLE FLORIDA OPERATOR ROTH

Calibration Data For Sampling Run: 1-3 Gas Type: NOX PPM Span: 1000	Cylinder Number	Cylinder Value % or PPM	Analizer Response	Absolute Difference	Difference % of Span
ZERO GAS	NITROGEN	0.00	0.10	0.10	0.01
LOW-RANGE GAS					
MID-RANGE GAS	SG9139417BAL	457.00	456.00	1.00	0.10
HIGH-RANGE GAS	SG913578	841.00	837.00	4.00	0.40

Calibration Data For Sampling Run: 1-3 Gas Type: SO2 Span: 300	Cylinder Number	Cylinder Value % or PPM	Analizer Response	Absolute Difference	Difference % of Span
ZERO GAS	NITROGEN	0.00	0.70	0.70	0.23
LOW-RANGE GAS	0				
MID-RANGE GAS	AAL16725	127.30	130.90	3.60	1.20
HIGH-RANGE GAS	SG9130580BAL	219.00	220.80	1.80	0.60

Calibration Data For Sampling Run: 1-3 Gas Type: CO2% Span: 20	Cylinder Number	Cylinder Value % or PPM	Analizer Response	Absolute Difference	Difference % of Span
ZERO GAS	NITROGEN	0.00%	0.00%		
LOW-RANGE GAS					
MID-RANGE GAS	SG9133061BAL	10.80%	11.00%	0.00	0.01
HIGH-RANGE GAS	SG9127079BAL	17.00%	17.00%	0.00	0.00

ANALYZER CALIBRATION DATA

CLIENT JEA SJRPP PROJECT#: 95-420-FL TEST DATE 11/7/95

SOURCE IDENTIFICATION JACKSONVILLE FLORIDA OPERATOR TESTER

Calibration Data For Sampling Runs 1-10 Gas Type: NOX PPM Span: 1000	Cylinder Number	Cylinder Value % or PPM	Analizer Response	Absolute Difference	Difference % of Span
ZERO GAS	SG927489	0.00	0.10	0.10	0.01
LOW-RANGE GAS					
MID-RANGE GAS	SG9139417BAL	457.00	463.60	6.60	0.66
HIGH-RANGE GAS	SG913578	841.00	842.30	1.30	0.13

Calibration Data For Sampling Runs 1-10 Gas Type: SO2 Span: 300	Cylinder Number	Cylinder Value % or PPM	Analizer Response	Absolute Difference	Difference % of Span
ZERO GAS	SG927489	0.00	0.00	0.00	0.00
LOW-RANGE GAS	0		0.00	0.00	0.00
MID-RANGE GAS	AAL16725	127.30	122.30	5.00	1.67
HIGH-RANGE GAS	SG9130580BAL	219.00	220.30	1.30	0.43

Calibration Data For Sampling Runs 1-10 Gas Type: CO2% Span: 20	Cylinder Number	Cylinder Value % or PPM	Analizer Response	Absolute Difference	Difference % of Span
ZERO GAS	SG927489	0.00%	0.00%	0.00%	0.00%
LOW-RANGE GAS				0.00%	0.00%
MID-RANGE GAS	SG9133061BAL	10.80%	11.10%	0.30%	1.50%
HIGH-RANGE GAS	SG9127079BAL	17.00%	17.00%	0.00%	0.00%

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SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT#: 95-420-FL TEST DATE 11/7/95

SOURCE IDENTIFICATIOI 1STACK OPERATOR T. ROTH

RUN NO:	1		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	NOX	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	1000	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00	0.10	4.50	0.44	4.50	0.44	0.00
UPSCALE GAS	457.00	463.60	423.70	-3.99	427.10	-3.65	0.34
	CMA	CO=	4.50	CM=	425.40		

RUN NO:	2		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	NOX	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	1000	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00	0.10	4.50	0.44	4.00	0.39	-0.05
UPSCALE GAS	457.00	463.60	427.10	-3.65	427.00	-3.66	-0.01
	CMA	CO=	4.25	CM=	427.05		

RUN NO:	3		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	NOX	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	1000	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00	0.10	4.00	0.39	5.40	0.53	0.14
UPSCALE GAS	457.00	463.60	427.00	-3.66	426.00	-3.76	-0.10
	CMA	CO=	4.70	CM=	426.50		

RUN NO:	4		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	NOX	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	1000	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00	0.10	5.40	0.53	5.20	0.51	-0.02
UPSCALE GAS	457.00	463.60	426.00	-3.76	426.60	-3.70	0.06
	CMA	CO=	5.30	CM=	426.30		

RUN NO:	5		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	NOX	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIF
SPAN:	1000	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPA
ZERO GAS	0.00	0.10	5.20	0.51	5.40	0.53	0.02
UPSCALE GAS	457.00	463.60	426.60	-3.70	435.00	-2.86	0.8
	CMA	CO=	5.30	CM=	430.80		

RUN NO:	6		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	NOX	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIF
SPAN:	1000	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPA
ZERO GAS	0.00	0.10	5.40	0.53	5.60	0.55	0.02
UPSCALE GAS	457.00	463.60	435.00	-2.86	443.00	-2.06	0.8
	CMA	CO=	5.50	CM=	439.00		

RUN NO:	7		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	NOX	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	1000	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%O
HIGH				% OF SPAN		% OF SPAN	SPA
ZERO GAS	0.00	0.10	5.60	0.55	5.40	0.53	-0.02
UPSCALE GAS	457.00	463.60	443.00	-2.06	432.00	-3.16	-1.1
	CMA	CO=	5.50	CM=	437.50		

RUN NO:	8		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	NOX	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	1000	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%O
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00	0.10	5.40	0.53	6.30	0.62	0.0
UPSCALE GAS	457.00	463.60	432.00	-3.16	442.00	-2.16	1.0
	CMA	CO=	5.85	CM=	437.00		

RUN NO:	9	ANALIZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT %OF SPAN
GAS TYPE:	NOX		SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	
SPAN:	1000						
HIGH							
ZERO GAS	0.00	0.10	6.30	0.62	6.50	0.64	0.02
UPSCALE GAS	457.00	463.60	442.00	-2.16	439.50	-2.41	-0.25
	CMA	CO=	6.40	CM=	440.75		

RUN NO:	10	ANALIZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT %OF SPAN
GAS TYPE:	NOX		SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	
SPAN:	1000						
HIGH							
ZERO GAS	0.00	0.10	6.50	0.64	6.50	0.64	0.00
UPSCALE GAS	457.00	463.60	439.50	-2.41	432.00	-3.16	-0.75
	CMA	CO=	6.50	CM=	435.75		

RUN NO:	11	ANALIZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT %OF SPAN
GAS TYPE:	NOX		SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	
SPAN:	1000						
HIGH							
ZERO GAS	0.00	0.10	6.50	0.64	6.30	0.62	-0.02
UPSCALE GAS	457.00	463.60	432.00	-3.16	425.00	-3.86	-0.70
	CMA	CO=	6.40	CM=	428.50		

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT#: 95-420-FL TEST DATE 11/7/95

SOURCE IDENTIFICATION 1STACK OPERATOR T. ROTH

RUN NO:	1		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	CO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	20	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00%	0.00%	0.10%	0.01	0.20%	0.01	0.01
UPSCALE GAS	10.80%	11.10%	10.50%	-0.03	10.50%	-0.03	0.00
	CMA	CO=	0.00	CM=	0.11		

RUN NO:	2		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	CO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	20	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00%	0.00%	0.20%	0.01	0.20%	0.01	0.00
UPSCALE GAS	10.80%	11.10%	10.50%	-0.03	10.50%	-0.03	0.00
	CMA	CO=	0.00	CM=	0.11		

RUN NO:	3		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	CO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	20	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00%	0.00%	0.20%	0.01	0.20%	0.01	0.00
UPSCALE GAS	10.80%	11.10%	10.50%	-0.03	10.50%	-0.03	0.00
	CMA	CO=	0.00	CM=	0.11		

RUN NO:	4		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	CO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	20	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00%	0.00%	0.20%	0.01	0.20%	0.01	0.00
UPSCALE GAS	10.80%	11.10%	10.50%	-0.03	10.50%	-0.03	0.00
	CMA	CO=	0.00	CM=	0.11		

RUN NO:	5	ANALIZER	INITIAL VALUES		FINAL VALUES		
GAS TYPE:	CO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	20	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00%	0.00%	0.20%	0.01	0.20%	0.01	0.00
UPSCALE GAS	10.80%	11.10%	10.50%	-0.03	10.50%	-0.03	0.00
	CMA	CO=	0.00	CM=	0.11		

RUN NO:	6		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	CO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	20	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00%	0.00%	0.20%	0.01	0.20%	0.01	0.00
UPSCALE GAS	10.80%	11.10%	10.50%	-0.03	10.50%	-0.03	0.00
	CMA	CO=	0.00	CM=	0.11		

RUN NO:	7		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	CO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	20	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00%	0.00%	0.20%	0.01	0.20%	0.01	0.00
UPSCALE GAS	10.80%	11.10%	10.50%	-0.03	10.50%	-0.03	0.00
	CMA	CO=	0.00	CM=	0.11		

RUN NO:	8		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	CO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	20	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00%	0.00%	0.20%	0.01	0.20%	0.01	0.00
UPSCALE GAS	10.80%	11.10%	10.50%	-0.03	10.50%	-0.03	0.00
	CMA	CO=	0.00	CM=	0.11		

RUN NO:	9		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	CO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	20	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00%	0.00%	0.20%	0.01	0.20%	0.01	0.00
UPSCALE GAS	10.80%	11.10%	10.50%	-0.03	10.50%	-0.03	0.00
	CMA	CO=	0.00	CM=	0.11		

RUN NO:	10		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	CO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	20	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00%	0.00%	0.20%	0.01	0.20%	0.01	0.00
UPSCALE GAS	10.80%	11.10%	10.50%	-0.03	10.50%	-0.03	0.00
	CMA	CO=	0.00	CM=	0.11		

RUN NO:	11		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	CO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	20	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00%	0.00%	0.20%	0.01	0.20%	0.01	0.00
UPSCALE GAS	10.80%	11.10%	10.50%	-0.03	10.50%	-0.03	0.00
	CMA	CO=	0.00	CM=	0.11		

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SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA SJRPP PROJECT#: 95-420-FL TEST DATE 11/7/95

SOURCE IDENTIFICATION 1STACK OPERATOR T. ROTH

RUN NO:	1		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	SO2	ANALIZER RESPONSE	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	DRI %C SPA
SPAN: HIGH	300						
ZERO GAS	0.00	0.00	2.10	0.70	10.00	3.33	2.6
UPSCALE GAS	219.00	220.30	220.00	-0.10	217.50	-0.93	-0.8

CMA CO= 6.05 CM= 218.75

RUN NO:	2		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	SO2	ANALIZER RESPONSE	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	DRIF %O SPA
SPAN: HIGH	300						
ZERO GAS	0.00	0.00	10.00	3.33	12.20	4.07	0.7
UPSCALE GAS	219.00	220.30	217.50	-0.93	217.50	-0.93	0.0

CMA CO= 11.10 CM= 217.50

RUN NO:	3		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	SO2	ANALIZER RESPONSE	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	DRIF %O SPA
SPAN: HIGH	300						
ZERO GAS	0.00	0.00	12.20	4.07	12.40	4.13	0.0
UPSCALE GAS	219.00	220.30	217.50	-0.93	215.40	-1.63	-0.7

CMA CO= 12.30 CM= 216.45

RUN NO:	4		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	SO2	ANALIZER RESPONSE	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	DRIF %O SPA
SPAN: HIGH	300						
ZERO GAS	0.00	0.00	12.40	4.13	12.00	4.00	-0.1
UPSCALE GAS	219.00	220.30	215.40	-1.63	214.80	-1.83	-0.2

CMA CO= 12.20 CM= 215.10

RUN NO:	5	ANALIZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT %OF SPAN
GAS TYPE:	SO2		SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	
SPAN:	300						
HIGH							
ZERO GAS	0.00	0.00	12.00	4.00	11.30	3.77	-0.23
UPSCALE GAS	219.00	220.30	214.80	-1.83	215.00	-1.77	0.07
	CMA	CO=	11.65	CM=	214.90		

RUN NO:	6	ANALIZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT %OF SPAN
GAS TYPE:	SO2		SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	
SPAN:	300						
HIGH							
ZERO GAS	0.00	0.00	11.30	3.77	11.20	3.73	-0.03
UPSCALE GAS	219.00	220.30	215.00	-1.77	210.00	-3.43	-1.67
	CMA	CO=	11.25	CM=	212.50		

RUN NO:	7	ANALIZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT %OF SPAN
GAS TYPE:	SO2		SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	
SPAN:	300						
HIGH							
ZERO GAS	0.00	0.00	11.20	3.73	11.00	3.67	-0.07
UPSCALE GAS	219.00	220.30	210.00	-3.43	209.00	-3.77	-0.33
	CMA	CO=	11.10	CM=	209.50		

RUN NO:	8	ANALIZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT %OF SPAN
GAS TYPE:	SO2		SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL.BIAS % OF SPAN	
SPAN:	300						
HIGH							
ZERO GAS	0.00	0.00	11.00	3.67	11.20	3.73	0.07
UPSCALE GAS	219.00	220.30	209.00	-3.77	208.60	-3.90	-0.13
	CMA	CO=	11.10	CM=	208.80		

RUN NO:	9		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	SO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	300	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00	0.00	11.20	3.73	11.80	3.93	0.20
UPSCALE GAS	219.00	220.30	208.60	-3.90	209.40	-3.63	0.27
	CMA	CO=	11.50	CM=	209.00		

RUN NO:	10		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	SO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	300	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00	0.00	11.80	3.93	11.40	3.80	-0.13
UPSCALE GAS	219.00	220.30	209.40	-3.63	210.20	-3.37	0.27
	CMA	CO=	11.60	CM=	209.80		

RUN NO:	11		INITIAL VALUES		FINAL VALUES		
GAS TYPE:	SO2	ANALIZER	SYSTEM	SYSTEM	SYSTEM	SYSTEM	DRIFT
SPAN:	300	RESPONSE	RESPONSE	CAL.BIAS	RESPONSE	CAL.BIAS	%OF
HIGH				% OF SPAN		% OF SPAN	SPAN
ZERO GAS	0.00	0.00	11.40	3.80	11.20	3.73	-0.07
UPSCALE GAS	219.00	220.30	210.20	-3.37	207.30	-4.33	-0.97
	CMA	CO=	11.30	CM=	208.75		

ANALYZER CALIBRATION DATA

CLIENT JEA SJRPP PROJECT#: 95-420-FL TEST DATE 11/6/95

SOURCE IDENTIFICATION JACKSONVILLE FLORIDA OPERATOR T. Roth

Calibration Data For Sampling Run: 1- 10 Gas Type: NOX PPM Span: 1000	Cylinder Number	Cylinder Value % or PPM	Analizer Response	Absolute Difference	Difference % of Span
ZERO GAS	SG927489	0.00	0.10	0.10	0.01
LOW-RANGE GAS					
MID-RANGE GAS	SG9139417BAL	457.00	456.00	1.00	0.10
HIGH-RANGE GAS	SG913578	841.00	837.00	4.00	0.40

Calibration Data For Sampling Run: 1- 10 Gas Type: SO2 Span: 300	Cylinder Number	Cylinder Value % or PPM	Analizer Response	Absolute Difference	Difference % of Span
ZERO GAS	SG927489	0.00	0.70	0.70	0.23
LOW-RANGE GAS					
MID-RANGE GAS	AAL16725	127.30	130.90	3.60	1.20
HIGH-RANGE GAS	SG9130580BAL	219.00	220.80	1.80	0.60

Calibration Data For Sampling Run: 1- 10 Gas Type: CO2% Span: 20	Cylinder Number	Cylinder Value % or PPM	Analizer Response	Absolute Difference	Difference % of Span
ZERO GAS	SG927489	0.00%	0.10%	0.00	0.01
LOW-RANGE GAS					
MID-RANGE GAS	SG9133061BAL	10.80%	11.00%	0.00	0.01
HIGH-RANGE GAS	SG9127079BAL	17.00%	17.00%	0.00	0.00

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT JEA-SJRPP PROJECT # 95-420-DH DATE 11/6/95

SOURCE INDENTIFICATION UNIT 2 STACK OPERATOR STILES

RUN NO: 1 GAS TYPE: NO_x SPAN: 1000	ANALYZER RESPONSE	INITIAL VALUES: SYSTEM RESPONSE	INITIAL VALUES: SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES: SYSTEM RESPONSE	FINAL VALUES: SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	4.4	.44	5.4	.54	.10
UPSCALE GAS	456.0	429.5	2.65	420.2	3.6	.93

RUN NO: 1 GAS TYPE: SO_2 SPAN: 300	ANALYZER RESPONSE	INITIAL VALUES: SYSTEM RESPONSE	INITIAL VALUES: SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES: SYSTEM RESPONSE	FINAL VALUES: SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	2.3	.77	4.6	1.53	.77
UPSCALE GAS	220.8	208.6	4.07	209.8	3.7	.40

RUN NO: 1 GAS TYPE: CO_2 SPAN: 20	ANALYZER RESPONSE	INITIAL VALUES: SYSTEM RESPONSE	INITIAL VALUES: SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES: SYSTEM RESPONSE	FINAL VALUES: SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	.3	1.50	.20	1.0	.50
UPSCALE GAS	11.0	10.6	2.00	10.60	2.0	0.0

RUN NO: 1 GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES: SYSTEM RESPONSE	INITIAL VALUES: SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES: SYSTEM RESPONSE	FINAL VALUES: SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

Best Available Copy

CLIENT J.E.A. SJ.R.P.P. PROJECT # 95-420-FI DATE 11/6/95

SOURCE INDENTIFICATION Unit #2 Stack OPERATOR T. Roth

RUN NO: 2 GAS TYPE: NOX SPAN: 1000	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	5.4	.54	5.5	.55	.01
UPSCALE GAS	456.0	420.2	3.6	426.2	2.98	.60

RUN NO: 2 GAS TYPE: SO_2 SPAN: 300	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	4.6	1.53	6.2	2.07	.53
UPSCALE GAS	220.8	209.8	3.7	208.3	4.17	.50

RUN NO: 2 GAS TYPE: CO_2 SPAN: 20	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	.20	1.0	.20	1.0	0.0
UPSCALE GAS	11.0	10.60	2.0	10.6	2.0	0.0

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-420-F1 DATE 11/6/95

SOURCE INDENTIFICATION Unit # 2 Stack OPERATOR T. Roth

RUN NO: 3 GAS TYPE: NOx SPAN: 1000	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	5.5	.55	5.0	.50	.05
UPSCALE GAS	456.0	426.2	2.98	426.01	3.0	.02

RUN NO: 3 GAS TYPE: SO_2 SPAN: 390	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	6.2	2.07	6.20	2.07	0.0
UPSCALE GAS	220.8	208.3	4.17	208.5	4.10	.07

RUN NO: 3 GAS TYPE: CO_2 SPAN: 20	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	.20	1.0	.20	1.0	0.0
UPSCALE GAS	11.0	10.60	2.0	10.6	2.0	0.0

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-420-F1 DATE 11/6/95

SOURCE INDENTIFICATION Unit #2 Stack OPERATOR T. Roth

RUN NO: 4 GAS TYPE: NOx SPAN: 1000	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	5.0	.50	4.80	.48	.02
UPSCALE GAS	456.0	426.01	3.0	421.9	3.41	.41

RUN NO: 4 GAS TYPE: SO_2 SPAN: 300	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	6.20	2.07	8.3	2.77	.70
UPSCALE GAS	220.8	208.5	4.10	210.8	3.33	.77

RUN NO: 4 GAS TYPE: CO_2 SPAN: 20	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	.20	1.0	.20	1.0	0.0
UPSCALE GAS	11.0	10.6	2.0	10.60	2.0	0.0

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

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SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. SJ.R.P.P. PROJECT # 95-420-F1 DATE 11/6/95

SOURCE INDENTIFICATION Unit #2 Stack OPERATOR T. Roth

RUN NO: 5 GAS TYPE: NOx SPAN: 1000	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	4.80	.48	5.40	.540	.06
UPSCALE GAS	456.0	421.9	3.41	422.4	3.36	.05

RUN NO: 5 GAS TYPE: SO_2 SPAN: 300	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	8.3	2.77	7.5	2.50	.27
UPSCALE GAS	220.8	210.8	3.33	210.8	3.33	0.0

RUN NO: 5 GAS TYPE: CO_2 SPAN: 20	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	.20	1.0	.20	1.0	0.0
UPSCALE GAS	11.0	10.60	2.0	10.60	2.0	0.0

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

FINAL SYSTEM CAL. RESPONSE - INITIAL SYSTEM CAL. RESPONSE

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-420-F1 DATE 11/6/95

SOURCE INDENTIFICATION Unit #2 Stack. OPERATOR T. Roth

RUN NO: 6 GAS TYPE: NO_x SPAN: 1000	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	5.40	.540	5.55	.56	.02
UPSCALE GAS	456.0	422.4	3.36	421.0	3.50	.140

RUN NO: 6 GAS TYPE: SO_2 SPAN: 300	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	7.5	2.50	8.0	2.67	.17
UPSCALE GAS	220.8	210.8	3.33	208.5	4.10	.77

RUN NO: 6 GAS TYPE: CO_2 SPAN: 20	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	.20	1.0	.20	1.0	0.0
UPSCALE GAS	11.0	10.60	2.0	10.60	2.0	0.0

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. SJ.R.P.P PROJECT # 95-420-F1 DATE 11/6/95

SOURCE INDENTIFICATION Unit # 2 stack OPERATOR T. Roth

RUN NO: 7 GAS TYPE: NOx SPAN: 1000	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	5.55	.56	5.9	.59	.04
UPSCALE GAS	456.0	421.0	3.50	422.8	3.3	.18

RUN NO: 7 GAS TYPE: SO_2 SPAN: 300	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	8.0	2.67	8.2	2.73	.07
UPSCALE GAS	220.8	208.5	4.10	2~~φ~~2.0	2.93	1.17

RUN NO: 7 GAS TYPE: CO_2 SPAN: 20	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	.20	1.0	.20	1.0	0.0
UPSCALE GAS	11.0	10.60	2.0	10.60	2.0	0.0

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

DRIFT = FINAL SYSTEM CAL. RESPONSE - INITIAL SYSTEM CAL. RESPONSE x 100

SYSTEM CALIBRATION ...

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CLIENT J.E.A, S.J.R.P.P. PROJECT # 95-420-F1 DATE 11/6/95

SOURCE INDENTIFICATION Unit # 2 Stack OPERATOR T. Roth

RUN NO: 8 GAS TYPE: NOx SPAN: 1000	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	5.9	.59	5.9	.59	0.0
UPSCALE GAS	456.6	422.8	3.3	422.9	3.37	.01

RUN NO: 8 GAS TYPE: SO_2 SPAN: 300	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	8.2	2.73	8.5	2.83	.10
UPSCALE GAS	220.8	212.0	2.93	210.7	3.37	.43

RUN NO: 8 GAS TYPE: CO_2 SPAN: 20	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS	0.0	.20	1.0	.30	1.50	.50
UPSCALE GAS	11.0	10.60	2.0	10.6	2.0	0.0

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES SYSTEM RESPONSE	INITIAL VALUES SYSTEM CAL. BIAS % OF SPAN	FINAL VALUES SYSTEM RESPONSE	FINAL VALUES SYSTEM CAL. BIAS % OF SPAN	DRIFT % OF SPAN
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

H20

SYSTEM CALIBRATION BIAS AND DRIFT DATA

CLIENT J.E.A. S.J.R.P.P. PROJECT # 95.424-F1 DATE 11/6/95

SOURCE INDENTIFICATION Unit #2 Stack OPERATOR T. Roth

RUN NO: 9 GAS TYPE: NOx SPAN: 1000	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	5.9	.59	8.2	.82	.23
UPSCALE GAS	456.6	422.9	3.37	422.9	3.37	0.0

RUN NO: 9 GAS TYPE: SO_2 SPAN: 300	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	8.5	2.83	8.52	2.84	.01
UPSCALE GAS	220.8	210.7	3.37	218.70	.70	2.67

RUN NO: 9 GAS TYPE: CO_2 SPAN: 20	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	.30 TR	1.50 TR	.30	1.50	0.0
UPSCALE GAS	11.0	10.6	2.0	10.60	2.0	0.0

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

FINAL SYSTEM CAL. RESPONSE - INITIAL SYSTEM CAL. RESPONSE X 100

SYSTEM CALIBRATION BIAS AND DRIFT DATA

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CLIENT J.E.A. S.J.R.P.P. PROJECT # 95-420-FL DATE 11/6/95

SOURCE INDENTIFICATION Unit #2 Stack OPERATOR T. Roth

RUN NO: 10 GAS TYPE: NOx SPAN: 1000	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	8.2	.82	6.33	.63	.19
UPSCALE GAS	456.6	422.9	3.37	422.0	3.46	.09

RUN NO: 10 GAS TYPE: SO_2 SPAN: 300	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	8.52	2.84	7.9	2.63	.21
UPSCALE GAS	220.8	218.70	.70	220.6		

RUN NO: 10 GAS TYPE: CO_2 SPAN: 20	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS	0.0	.30	1.50	.30	1.50	0.0
UPSCALE GAS	11.0	10.60	2.0	10.60	2.0	0.0

RUN NO: GAS TYPE: SPAN:	ANALYZER RESPONSE	INITIAL VALUES		FINAL VALUES		DRIFT % OF SPAN
		SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	SYSTEM RESPONSE	SYSTEM CAL. BIAS % OF SPAN	
ZERO GAS						
UPSCALE GAS						

$$\text{SYSTEM CALIBRATION BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL SYSTEM CAL. RESPONSE}}{\text{SPAN}} \times 100$$

Response Time

NOx, SO_2, CO_2

span gas concentration: 1000, 300, 20

analyzer span setting:

ppm/% → 457.0 ppm, 219.0 ppm, 10.80%

Date: 11-6-95

By: T. Roth

upscale:

1. 289 seconds
2. 294 seconds
3. 300 seconds

avg. response: 294.3 seconds

downscale:

1. 275 seconds
2. 278 seconds
3. 270 seconds

avg. response: 274.3 seconds

system response time: ________ seconds

slower average time: 300 seconds 5 min. TO 98% of cal value, 4.7 min TO 90%

CALIBRATION SHEETS/GAS CERTIFICATION SHEETS

Dry Gas Meter Calibration Sheet

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Client: ______________________ Run By: R. Kemp

Project No. ______________________ Date: 17 Oct 95

Module: RAC-2-NC Barometric Press. 29.60

Orifice: 290

American Meter Co.
AL-21 13865
Wet

ΔH in. H_2O	Vw Initial	Vw Final	Vw $ft.^3$	Vd Initial	Vd Final	Vd $ft.^3$	tw °F	tdi °F	tdo °F	td	Time θ min.
.5	134.180	139.180	4.061	894.065	898.344	4.279	65	76	71	74	10.0
1.0	138.470	144.140	5.670	898.576	904.557	5.981	65	88	72	77	10.0
1.5	145.740	152.590	6.850	905.187	912.433	7.246	65	79	73	76	10.0
2.0	152.985	159.861	7.876	912.857	921.200	8.343	65	81	73	77	10.0
3.0	160.160	169.791	9.631	921.523	931.769	10.246	65	81	73	77	10.0

ΔH	$\frac{\Delta H}{13.6}$	Yi $= \frac{Vw\ Pb\ (td + 460)}{Vd\ (Pb + \Delta H/13.6)(tw + 460)}$	Yi	ΔH@ (For Small Orifice Only) $= \frac{0.0317\,\Delta H}{Pb\ (td + 460)} \left[\frac{(tw + 460)\ \theta}{Vw}\right]^2$	ΔH@i
.5	.0368	.96		1.6759	.07
1.0	.0737	.96		1.7194	.02
1.5	.110	.96		1.7605	.02
2.0	.147	.96		1.7723	.03
3.0	.221	.95		1.7778	.04
Average		.96		1.7412	

ΔH = Orifice Setting

Vw = Volume of Gas of Wet Test Meter

Vd = Volume of Gas of Dry Gas Meter

tw = Temperature of Fluid in Wet Test Meter

tdi = Inlet Temperature of Dry Gas Meter

tdo = Outlet Temperature of Dry Gas Meter

td = Average Temperature of Dry Gas Meter

θ = Time required to pull specified cubic feet

Yc = Dry Gas Meter Correction Factor

ΔH@ = Orifice setting that would pull .75 cfm of air at standard conditions

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B. Kemp
10-17-95

DeltaH	Vd3
.5	4.279
1.0	5.981
1.5	7.246
2.0	8.343
3.0	10.246

Possible Combinations

(3.0 - 2.0) / (1.049 - .696)= 2.826
(3.0 - 1.5) / (1.049 - .525)= 2.858
(3.0 - 1.0) / (1.049 - .357)= 2.889
(3.0 - .5) / (1.049 - .183)= 2.884
(2.0 - 1.5) / (.696 - .525)= 2.923
(2.0 - 1.0) / (.696 - .357)= 2.955
(2.0 - .5) / (.696 - .183)= 2.924
(1.5 - 1.0) / (.525 - .357)= 2.988
(1.5 - .5) / (.525 - .183)= 2.924
(1.0 - .5) / (.357 - .183)= 2.863

Average orifice: 2.903

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Client JEA/SJRPP (Jacksonville) Run By R. Kemp

Project No. 95-420-FL Date 11-10-95

Module Rac-2 Barometric Pressure 29.50

Orifice 2.903

Avg. ΔH WC	Vw initial	Vw final	Vw CF	Vdg initial	Vdg final	Vdg CF	tw °F	tdgi °F	tdgo °F	Time Δθ min.
1.0	636.773	642.197	5.424	466.028	472.027	5.999	63	85	72	10 Min
1.0	643.074	648.497	5.423	473.089	479.093	6.004	64	88	73	10 Min
1.0	650.417	655.851	5.434	481.118	487.128	6.010	64	88	74	10 Min

ΔH	$\frac{H}{\Delta 13.6}$	Mc(Y) $\frac{Vw\ Pb\ (tdg + 460)}{Vdg(Pb + \Delta H/13.6)(tw + 460)}$	H@ $\frac{0.0317\Delta H}{Pb\ (td + 460)} \left[\frac{(tw + 460)\Delta\theta}{Vw}\right]^2$
1.0	.0737	.9295 .00	1.8536 .00
1.0	.0737	.9285 Avg. .9297 .00	1.8543 Avg 1.8516 .00
1.0	.0737	.9312 .00	1.8470 .00

Pre-Test Calibration Avg.= Post-Test Calibration Avg.=

Diff. of Avg. Pre/Post-Test Calibration = D =

ΔH = Orifice Setting

Vw = Volume of Gas of Wet Test Meter

Vdg = Volume of Gas of Dry Gas Meter

tw = Temperature of Fluid in Wet Test Meter

tdgi = Inlet Temperature of Dry Gas Meter

tdgo = Outlet Temperature of Dry Gas Meter

tdg = Average Temperature of Dry Gas Meter

Δθ = Time required to pull specified cubic feet

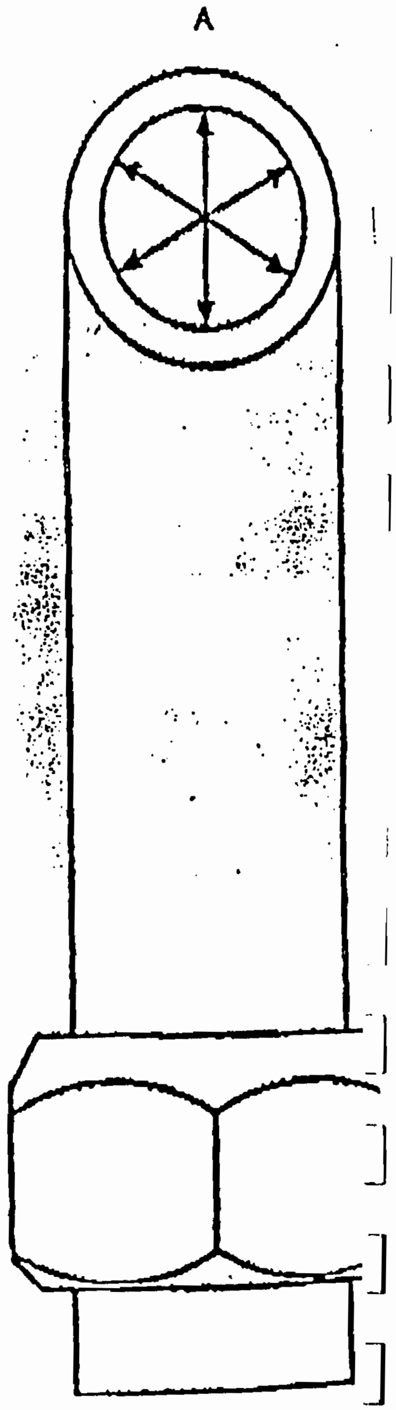
Mc = Dry Gas Meter Correction Factor

ΔHa = Orifice setting that equates to .75 cfm of air at standard conditions.

Sized By C. Carolus

Date	Nozzle	Dimension A	Dimension B	Dimension C	Difference	Avg. Diameter
7-11-95	NC-1	.179	.180	.180	.001	.180
" "	NC-2	.185	.184	.184	.001	.184
" "	NC-3	.184	.184	.186	.002	.185
" "	NC-4	.245	.243	.244	.002	.244
" "	NC-5	.236	.234	.235	.002	.235
" "	NC-6	.240	.242	.241	.002	.241
" "	NC-7	.249	.251	.249	.002	.250
" "	NC-8	.251	.253	.251	.002	.252
" "	NC-9	.310	.308	.308	.003	.309
" "	NC-10	.310	.312	.313	.003	.312
" "	NC-11	.312	.312	.311	.001	.312
" "	NC-12	.370	.370	.372	.002	.371
" "	NC-13	.374	.372	.375	.003	.374
" "	NC-14	.370	.370	.373	.003	.371
" "	NC-15	.375	.375	.372	.003	.373
" "	NC-16	.420	.419	.418	.002	.419
" "	NC-17	.437	.437	.436	.001	.437
" "	NC-18	.490	.490	.491	.001	.490
" "	NC-19	.495	.495	.496	.001	.495
" "	NC-20	.750	.750	.751	.001	.750
10-26-95	NC-21	.369	371	371	.002	.370

All Dimensions are in inches



TSA

Pitot Calibration Form

Client Shop Quality
Project No.
Test Location Umatilla, FL.

Run By T. Roth / J. Tayfel
Date 2-27-95
Pitot No. A-10-1-1-FL

	● "A" Side Calibration			
Run No.	△ Pstd cm H_2O (in H_2O)	△P (s) cm H_2O (in. H_2O)	$C_p(s)$	Deviation $C_p(s)-\bar{C}_p(A)$
1	.840	1.200	.828	-0.360
2	.860	1.267	.816	-0.407
3	.903	1.200	.859	-0.297
	Average	$\bar{C}_p$ (Side A)	.834	-0.355

	●● "B" Side Calibration			
Run No.	△ Pstd cm H_2O (in H_2O)	△P (s) cm H_2O (in. H_2O)	$C_p(s)$	Deviation $C_p(s)-\bar{C}_p(B)$
1	.840	1.200	.828	-0.360
2	.860	1.233	.827	-0.373
3	.903	1.200	.859	-0.297
	Average	$\bar{C}_p$ (Side B)	.838	-0.343

Calculations:

$$C_p\ (s) = 0.99 \sqrt{\frac{\Delta P\ (\text{standard})}{\Delta P\ (s)}}$$

Deviation = C_p (s) = $\bar{C}_p$ (A or B)

$$\text{Average Deviation} = \sigma\ (\text{A or B}) = \frac{\sum_{1}^{3} |C_p\ (s) - \bar{C}_p\ (\text{A or B})|}{3}$$

$|\bar{C}_p(\text{Side A}) - \bar{C}_p(\text{Side B})|$ = -.012

Nozzle size used for Calibrations (inches) 1/4" Fl-003
Intercomponent Spacings During Calibrations:
Pitot - Nozzle: ± 3/4"
Pitot - Thermocouple: 1/2"
Pitot - Probe Sheath: 1/2"

Total Source Analysis, Inc.
Environmental Testing Consultants

ir Products and Chemicals, Inc.
.O. BOX 351
.D. #1
AMAQUA, PA 18252

Best Available Copy

Certificate of Analysis - EPA Protocol Gas Standard

ERFORMED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS (PROCEDURE #G1

ustomer:
AIR PRODUCTS
1115 SLIGH BLVD.
ORLANDO FL 32806-

Notes:

Order No: 854-049085
Batch No: 255-68049
Cylinder No: SG9151139B
Cylinder Pressure*: 2000 psig
Certification Date: 05/18/95
Expiration Date: 05/18/97

PO: -Rel:

** Certified Concentration ***		********* Reference Standards *********			************* Analytical Instrumentation *********			
omponent	Certified Concentration	Cylinder #	Standard Number	Concentration	Instrument Make/Model	Serial Number	Last Calibration	Measurement Principal
TRIC OXIDE	457 ±2.53 PPM	SG9139417BAL	GMIS	485.4000 PPM	Thermal Enviro	10S-4502	05/17/95	CHEMILUMINESCE

alance Gas: Nitrogen

16

* Standard should not be used below 150 psig

alyst: Dave Woodward /MK
Dave Woodward

Approved By: K Roubik /MK
Ken Roubik

r-- ic' ind em. ls, ic.
LTY G EPARTMENT
S. WENTWORTH AVENUE
GO, IL 60628

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Certificate of Analysis - EPA Protocol Gas Standard

RMED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS (PROCEDURE #G1)

mer:
I
0 WARNER RD.
LEY VIEW
VELAND OH 44125

Notes:

Order No: 231-019520-
Batch No: 861-23432

Cylinder No: SG9135718BA
Cylinder Pressure*: 2000 psig
Certification Date: 02/06/95
Expiration Date: 02/06/97

Rel:

Certified Concentration ***		********* Reference Standards *********			************** Analytical Instrumentation **********			
onent	Certified Concentration	Cylinder #	Standard Number	Concentration	Instrument Make/Model	Serial Number	Last Calibration	Measurement Principal
IC OXIDE	841 ±2.1 PPM	SG9113409BAL	GMIS	875.2000 PPM	Rosemount 951a	0101877	01/13/95	CHEMILUMINESCEN

nce Gas: Nitrogen

aminent

ogen Dioxide .500 PPM

Standard should not be used below 150 psig

alyst: Shaher Aboor
Shaher Aboor

Approved By: Robert McNear
Robert McNear

1290 COMBERMERE STREET, TROY, MI 48083 (313) 589-2950 FAX: (313) 589-2134

Best Available Copy

CERTIFICATE OF ANALYSIS: EPA PROTOCOL GAS

Customer
TOTAL SOURCE ANALYSIS
510 DICKSON STREET
WELLINGTON OH 44090

Assay Laboratory
Scott Specialty Gases, Inc.
1290 Combermere
Troy, MI 48083

Purchase Order 1360
Scott Project # 560542

ANALYTICAL INFORMATION

Certified to exceed the minimum specifications of EPA Protocol 1 Procedure #G1, Section Number 3.0.4

Cylinder Number AAL16725 **Certification Date** 1-24-94 **Expiration Date** 1-24-96
Cylinder Pressure 1900 psig **Previous Certification Dates** None

ANALYZED CYLINDER

Components	Certified Concentration	Analytical Uncertainty*
Sulfur Dioxide	127.3 ppm	±1% NIST Directly Traceable

Balance Gas: Nitrogen

*Analytical uncertainty is inclusive of usual known error sources which at least includes reference standard error & precision of the measurement processes.

REFERENCE STANDARD

Type	Expiration Date	Cylinder Number	Concentration
NTRM 0260	5-3-95	ALM026294	260.5 PPM SO_2 IN N_2

INSTRUMENTATION

Instrument/Model/Serial #	Last Date Calibrated	Analytical Principle
SO_2-HORIBA/OPE-135/56037204	1-6-94	Non-Dispersive Infrared

ANALYZER READINGS (Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

Components	First Triad Analysis	Second Triad Analysis	Calibration Curve
Sulfur Dioxide	Date: 1-14-94 Response Units: mv Z1=0.00 R1=61.90 T1=32.10 R2=61.90 Z2=0.00 T2=32.10 Z3=0.00 T3=32.10 R3=61.90 Avg. Conc. of Cust. Cyl. 127.3 ppm	Date: 1-24-94 Response Units: mv Z1=0.00 R1=61.90 T1=32.10 R2=61.90 Z2=0.00 T2=32.10 Z3=0.00 T3=32.10 R3=61.90 Avg. Conc. of Cust. Cyl. 127.3 ppm	Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$ r=0.99999 NTRM 0260 Constants: A=0.4395865 B=3.693882 C=0.008417231 D=0 E=0
			Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$
			Concentration=$A+Bx+Cx^2+Dx^3+Ex^4$

Special Notes

Analyst Frank P. Doran

F___luc .an ..hem___ls-- nc-

IALTY GAS DEPARTMENT
0 S. ALAMEDA STREET
BEACH, CA 90810

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Certificate of Analysis - EPA Protocol Gas Standard

ORMED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS (PROCEDURE #G1)

omer:
R PRODUCTS AND CHEMICALS
1 WEST 12TH STREET
NG BEACH CA 90813

Notes:

Order No: 235-066104-01
Batch No: 863-19229

Cylinder No: SG9136135BAL
Cylinder Pressure*: 2000 psig
Certification Date: 09/01/95
Expiration Date: 09/01/97

: Rel:

*** Certified Concentration ***		********* Reference Standards *********			************* Analytical Instrumentation ************			
onent	Certified Concentration	Cylinder #	Standard Number	Concentration	Instrument Make/Model	Serial Number	Last Calibration	Measurement Principal
JR DIOXIDE	219 ±1.2 PPM	SG9130580BAL	GMIS	258.2000 PPM	HORIBA VIA-510	85113516	09/01/95	INFRARED HORIBA

.ce Gas: Nitrogen

Standard should not be used below 150 psig

yst: KOOK JEON

Approved By: ANNE M EHLERS

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ir Produc[illegible] and Chemicals, Inc.
PECIALTY G[illegible] DEPARTMENT
2722 S. WENTWORTH AVENUE
HICAGO, IL 60628

Certificate of Analysis - EPA Protocol Gas Standard

RFORMED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS (PROCEDURE #G

ustomer:
APCI
5420 WARNER RD.
VALLEY VIEW
CLEVELAND OH 44125

Notes:

PO: Rel:

Order No: 231-01952
Batch No: 861-23264
Cylinder No: SG9133061
Cylinder Pressure*: 2000 psig
Certification Date: 01/21/95
Expiration Date: 01/21/98

** Certified Concentration ***		********* Reference Standards *********			************* Analytical Instrumentation *******			
mponent	Certified Concentration	Cylinder #	Standard Number	Concentration	Instrument Make/Model	Serial Number	Last Calibration	Measurement Principal
RBON DIOXIDE	10.8 ±.04 %	SG9113419BAL	GMIS	11.0000 %	Horiba VIA-510	51135063	01/13/95	INFRARED HORI

lance Gas: Nitrogen

* Standard should not be used below 150 psig

lyst: Richard VanDyke

Approved By: Robert McNear

r ..oduc..s a... Ch....ca..., In..
). BOX 351
). #1
IAQUA, PA 18252

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RFORMED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS (PROCEDURE #G1)

stomer:
AIR PRODUCTS
1115 SLIGH BLVD.
ORLANDO FL 32806-

Notes:

Order No: 854-049085-
Batch No: 255-68475

Cylinder No: SG9148896BA
Cylinder Pressure*: 2000 psig
Certification Date: 05/22/95
Expiration Date: 05/22/98

PO: Rel:

*** Certified Concentration ***		********* Reference Standards *********			************* Analytical Instrumentation *********			
mponent	Certified Concentration	Cylinder #	Standard Number	Concentration	Instrument Make/Model	Serial Number	Last Calibration	Measurement Principal
RBON DIOXIDE	17.0 ±0.04 %	SG9127079BAL	GMIS	14.0190 %	Shimadzu Model	C1049300	04/19/95	GC-TCD

lance Gas: Nitrogen

* Standard should not be used below 150 psig

alyst: Michael Koval
Michael Koval

Approved By: K. Roubik /mk
Ken Roubik

PLANT OPERATING DATA

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ST. JOHNS RIVER POWER PARK
UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 0800
Date : 11/6/95
Initials : TM

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC M.Amps	Sparks	Comments
11	211	12	44.9	45	0	
12	209	12	44.2	45	0	
13	207	12	42.5	45	0	
14	200	12	41.0	51	0	
15	201	12	42.5	45	0	
16	197	12	42.1	43	0	
21	215	15	43.1	61	0	
22	215	15	42.3	61	0	
23	222	15	43.0	63	0	
24	214	15	42.2	61	0	
25	203	15	41.9	67	0	
26	204	15	41.5	67	0	
31	245	15	49.0	63	0	
32	243	15	48.8	61	0	
33	300	15	49.8	61	0	
34	206	15	41.9	61	0	
35	204	15	39.9	59	0	
36	204	15	40.9	63	0	
41	221	22	40.0	75	0	
42	218	22	43.0	90	0	
43	238	22	47.5	92	0	
44	209	22	41.9	90	0	
45	208	22	41.4	90	0	
46	216	22	43.4	90	0	
51	246	30	45.6	130	0	
52	244	30	45.2	130	0	
53	241	30	40.1	126	0	
54	235	31	39.9	114	0	
55	228	30	43.0	130	0	
56	235	30	44.7	130	0	
61	252	35	44.4	158	0	
62	254	35	46.1	156	0	
63	310	35	46.6	162	0	
64	307	35	46.8	158	0	
65	245	35	46.0	158	0	
66	259	35	41.7	138	0	
71	299	42	46.1	201	0	
72	252	42	14.7	193	0	
73	304	42	46.4	201	0	
74	258	42	43.4	197	0	J1

ST. JOHNS RIVER POWER PARK
UNIT #)
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 0300
Date : 11/6/95
Initials : TM

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC μAmps	Sparks	Comments
11	197	12	41.6	43	0	
12	200	12	40.8	47	0	
13	204	12	42.5	45	0	
14	208	12	43.7	43	0	
15	202	12	42.5	43	0	
16	204	12	43.1	43	0	
21	205	15	41.8	59	0	
22	209	15	41.6	63	0	
23	212	15	42.6	59	0	
24	214	15	43.0	59	0	
25	203	15	39.5	71	0	
26	211	15	41.9	61	0	
31	200	15	40.3	59	0	
32	205	16	36.6	61	0	
33	217	15	44.1	59	0	
34	225	15	44.6	63	0	
35	211	15	41.7	61	0	
36	219	15	45.0	59	0	
41	218	22	43.9	90	0	
42	217	22	44.2	86	0	
43	219	22	44.4	90	0	
44	214	22	43.1	86	0	
45	211	22	42.6	90	0	
46	212	22	43.0	86	0	
51	228	30	42.5	132	0	
52	222	30	41.9	130	0	
53	235	30	43.7	130	0	
54	214	30	42.2	126	0	
55	211	30	42.6	130	0	
56	253	30	46.9	126	0	
61	228	35	41.6	162	0	
62	236	35	43.7	162	0	
63	249	36	45.5	154	0	
64	307	35	47.4	158	0	
65	249	35	45.4	158	0	
66	235	36	44.1	166	7	
71	252	45	44.0	209	0	
72	240	45	43.6	203	0	
73	286	45	40.1	191	0	
74	255	45	44.2	209	0	J2

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ST. JOHNS RIVER POWER PARK
UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 0900
Date : 11/6/95
Initials : TM

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC mAmps	Sparks	Comments
11	211	12	44.8	51	0	
12	211	12	45.9	45	0	
13	209	12	43.0	45	0	
14	202	12	42.6	47	0	
15	202	12	42.4	45	0	
16	200	12	42.0	43	0	
21	215	15	43.0	61	0	
22	215	15	42.2	61	0	
23	221	15	45.0	61	0	
24	213	15	42.5	61	0	
25	198	15	41.9	63	0	
26	204	15	41.6	67	0	
31	243	15	48.0	61	0	
32	242	15	48.7	61	0	
33	302	15	50.0	61	0	
34	206	15	42.0	61	0	
35	201	15	40.1	59	0	
36	201	15	40.9	63	0	
41	221	22	40.0	75	0	
42	219	22	43.1	90	0	
43	238	22	47.6	90	0	
44	211	22	42.0	90	0	
45	207	22	41.2	90	0	
46	218	22	43.7	90	0	
51	247	30	45.8	126	0	
52	246	30	45.3	126	0	
53	241	30	44.3	130	0	
54	236	30	40.0	114	0	
55	228	30	43.0	130	0	
56	238	30	45.0	130	0	
61	253	35	44.5	158	0	
62	253	35	46.1	156	0	
63	308	35	46.4	162	0	
64	308	35	46.9	158	0	
65	245	35	46.0	158	0	
66	262	35	41.9	138	0	
71	257	42	46.1	201	0	
72	254	42	44.8	195	0	
73	307	42	46.6	201	0	J3
74	260	42	43.6	197	0	
75	252	42	39.5	90	0	
76	247	42	44.2	197	0	

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ST. JOHNS RIVER POWER PARK
UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 0900
Date : 11/6/95
Initials : TM

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC MAmps	Sparks	Comments
11	197	12	41.6	43	0	
12	199	12	40.4	51	0	
13	202	12	42.1	45	0	
14	207	12	43.4	47	0	
15	202	12	42.2	43	0	
16	208	12	43.6	45	0	
21	204	15	41.6	59	0	
22	210	15	41.5	63	0	
23	216	15	43.0	61	0	
24	218	15	43.4	61	0	
25	205	15	39.4	71	0	
26	211	15	41.7	59	0	
31	201	15	40.6	59	0	
32	205	15	37.0	61	0	
33	217	15	44.2	59	0	
34	226	15	44.7	63	0	
35	211	15	41.7	61	0	
36	217	15	44.8	59	0	
41	218	22	44.2	86	0	
42	218	22	44.4	86	0	
43	221	22	44.5	90	0	
44	214	22	43.0	84	0	
45	212	22	42.8	90	0	
46	212	22	43.0	86	0	
51	226	30	42.6	132	0	
52	222	30	42.2	130	0	
53	236	30	43.9	128	0	
54	221	30	42.3	126	0	
55	222	30	42.8	130	0	
56	254	30	47.1	126	0	
61	229	35	41.8	166	0	
62	237	35	43.7	158	0	
63	249	35	45.3	158	0	
64	308	35	47.8	162	0	
65	253	36	45.3	162	0	
66	239	35	45.0	169	6	
71	254	45	43.5	213	0	
72	241	45	43.7	205	0	
73	267	45	40.2	181	0	
74	254	45	44.1	209	0	J4

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UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1800
Date : 11/6/95
Initials : TM

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC MAmps	Sparks	Comments
11	215	12	45.1	47	0	
12	211	12	44.8	45	0	
13	208	12	42.6	45	0	
14	202	12	42.2	51	0	
15	201	12	42.4	45	0	
16	200	12	42.0	45	0	
21	217	15	43.2	61	0	
22	218	15	41.2	61	0	
23	225	15	45.4	61	0	
24	213	15	42.6	59	0	
25	203	15	42.0	61	0	
26	205	15	41.6	67	0	
31	244	15	49.2	59	0	
32	243	15	48.9	61	0	
33	303	15	50.0	61	3	
34	208	15	42.3	61	0	
35	202	15	40.2	59	0	
36	201	15	40.9	61	0	
41	222	22	40.2	75	0	
42	220	22	43.4	90	0	
43	240	22	48.0	40	0	
44	211	22	42.2	90	0	
45	209	22	41.5	90	0	
46	218	22	43.9	90	0	
51	250	30	46.1	130	0	
52	248	30	45.6	130	0	
53	242	30	44.4	126	0	
54	236	30	40.1	114	0	
55	229	30	43.1	128	0	
56	236	30	45.0	126	0	
61	255	35	44.8	156	0	
62	255	35	46.2	156	0	
63	311	35	46.7	162	0	
64	308	35	46.9	156	0	
65	246	35	46.1	158	0	
66	260	35	42.0	134	0	
71	302	42	46.2	201	0	
72	252	42	44.8	193	0	
73	306	42	46.4	201	0	
74	257	42	43.4	195	0	J5
75	251	42	39.2	98	0	
76	243	42	43.9	197	0	

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ST. JOHNS RIVER POWER PARK
UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1000
Date : 11/6/95
Initials : [illegible]

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC μAmps	Sparks	Comments
11	199	12	40.0	43	0	
12	200	12	40.8	45	0	
13	204	12	42.0	45	0	
14	207	12	43.7	45	0	
15	204	12	42.5	45	0	
16	211	12	43.6	43	0	
21	205	15	41.9	59	0	
22	209	15	41.5	67	0	
23	211	15	42.6	59	0	
24	211	15	43.9	59	0	
25	204	16	39.7	71	0	
26	211	15	41.9	59	0	
31	201	15	40.7	59	0	
32	205	15	37.9	61	0	
33	220	15	44.7	59	0	
34	226	15	45.0	61	0	
35	213	15	47.0	61	0	
36	221	15	45.2	61	0	
41	224	22	44.7	90	0	
42	221	22	44.8	86	0	
43	222	22	44.8	90	0	
44	216	22	43.4	86	0	
45	213	22	43.0	90	0	
46	214	22	43.2	90	0	
51	226	30	43.0	134	0	
52	225	30	42.5	130	0	
53	239	30	44.2	130	0	
54	221	30	42.5	126	0	
55	225	30	43.1	130	0	
56	252	30	48.3	130	0	
61	230	35	41.9	164	0	
62	239	35	44.1	162	0	
63	251	35	45.8	156	0	
64	312	35	47.8	162	0	
65	252	36	45.6	162	0	
66	248	35	43.2	164	6	
71	254	45	44.0	209	0	
72	241	45	43.7	205	0	
73	266	45	40.1	181	0	
74	253	45	43.8	209	0	J6
75	[illegible]	45	[illegible]	[illegible]	0	

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UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Date : 11/6/91
Initials : TM

1 A (1/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC μAmps	Sparks	Comments
11	213	12	45.1	45	0	
12	211	12	45.0	45	0	
13	211	12	43.4	45	0	
14	205	12	43.4	45	0	
15	204	12	43.1	43	0	
16	203	12	44.7	43	0	
21	218	15	43.4	61	0	
22	218	15	41.8	61	0	
23	225	15	45.7	61	0	
24	212	15	42.6	59	0	
25	202	15	42.1	59	0	
26	205	15	41.6	67	0	
31	247	15	49.5	61	0	
32	245	15	49.3	61	0	
33	309	15	50.8	68	0	
34	211	15	42.6	61	0	
35	205	15	40.5	59	0	
36	205	15	41.3	61	0	
41	225	22	40.5	75	0	
42	220	22	43.6	90	0	
43	241	22	48.1	90	0	
44	212	22	42.3	86	0	
45	209	22	41.8	90	0	
46	219	22	44.1	90	0	
51	252	30	46.3	130	0	
52	248	30	45.8	130	0	
53	245	30	44.6	130	0	
54	238	31	40.4	114	0	
55	229	30	43.3	130	0	
56	239	30	45.2	130	0	
61	256	35	44.8	158	0	
62	255	35	46.2	156	0	
63	313	35	46.9	162	0	
64	309	35	46.9	158	0	
65	248	36	46.0	158	0	
66	256	35	41.7	134	0	
71	257	42	45.9	197	0	
72	253	42	44.7	193	0	
73	304	42	46.4	201	0	
74	258	42	43.4	195	0	J7
75	253	42	39.4	90	0	
76	246	42	44.2	197	0	

ST. JOHNS RIVER POWER PARK
UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1400
Date : 11/6/95
Initials : TM

1 3 (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC mAmps	Sparks	Comments
11	198	12	41.6	45	0	
12	198	12	40.3	47	0	
13	202	12	42.9	43	0	
14	209	12	44.0	45	0	
15	205	12	43.1	43	0	
16	208	12	44.2	43	0	
21	207	15	41.3	59	0	
22	212	15	42.0	63	0	
23	219	15	43.2	61	0	
24	221	15	43.7	59	0	
25	207	15	40.1	71	0	
26	215	15	42.6	59	0	
31	206	15	41.4	61	0	
32	209	15	38.4	61	0	
33	222	15	45.0	59	0	
34	229	15	45.5	61	0	
35	215	15	42.3	61	0	
36	221	15	43.6	61	0	
41	225	22	45.2	86	0	
42	222	22	45.2	86	0	
43	224	22	45.2	90	0	
44	219	22	43.7	86	0	
45	214	22	43.2	90	0	
46	213	22	43.4	86	0	
51	226	31	43.4	138	0	
52	226	30	42.7	130	0	
53	240	30	44.4	130	0	
54	222	30	42.6	126	0	
55	224	30	43.3	126	0	
56	255	30	47.1	126	0	
61	230	35	41.9	162	0	
62	239	35	44.2	162	0	
63	256	35	45.9	162	0	
64	312	35	42.9	158	0	
65	249	35	45.5	158	0	
66	236	35	43.7	164	7	
71	256	45	44.4	211	0	
72	241	45	43.7	203	0	
73	292	45	40.1	181	0	
74	252	45	43.6	211	0	J8
75	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

BEST AVAILABLE COPY

ST. JOHNS RIVER POWER PARK
UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1200
Date : 11/6/91
Initials : TM

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	219	12	46.4	47	0	
12	216	12	45.6	45	0	
13	214	12	43.9	45	0	
14	208	12	43.6	47	0	
15	208	12	43.6	43	0	
16	204	12	43.0	43	0	
21	218	15	43.7	61	0	
22	218	15	43.0	61	0	
23	227	15	46.0	63	0	
24	218	15	43.5	59	0	
25	207	15	42.5	61	0	
26	206	15	42.1	67	0	
31	247	15	49.5	61	0	
32	246	15	49.4	63	0	
33	310	15	51.1	59	0	
34	209	15	42.6	61	0	
35	207	15	40.3	59	0	
36	204	15	41.3	61	0	
41	223	22	40.5	71	0	
42	220	22	43.5	86	0	
43	242	22	48.3	90	0	
44	212	22	42.3	86	0	
45	209	22	41.7	90	0	
46	219	22	44.0	90	0	
51	253	30	46.6	130	0	
52	249	30	46.0	130	0	
53	244	30	44.6	126	0	
54	239	30	40.2	114	0	
55	229	30	43.4	130	0	
56	240	30	45.4	130	0	
61	256	35	44.0	156	0	
62	255	35	46.4	154	0	
63	315	35	47.2	162	0	
64	312	35	47.2	138	0	
65	247	36	46.5	156	0	
66	302	35	47.6	138	0	
71	303	42	46.4	201	0	
72	254	42	45.0	193	0	
73	308	42	46.8	201	0	
74	262	42	43.8	195	0	J9
75	254	42	39.6	98	0	
76	249	42	44.5	197	0	

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HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Initials : TM

1 3 (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC mAmps	Sparks	Comments
11	204	12	42.3	43	0	
12	204	12	41.6	47	0	
13	206	12	43.4	43	0	
14	219	13	45.5	51	0	
15	212	12	44.1	43	0	
16	216	12	45.8	43	0	
21	212	15	42.6	59	0	
22	215	15	42.4	61	0	
23	222	15	43.9	61	0	
24	227	15	44.8	59	0	
25	204	15	40.0	71	0	
26	215	15	42.8	59	0	
31	207	15	41.6	63	0	
32	215	15	38.7	61	0	
33	223	15	45.5	59	0	
34	233	15	41.9	63	0	
35	218	15	42.8	63	0	
36	224	15	41.9	61	0	
41	228	22	45.6	86	0	
42	221	22	45.2	83	0	
43	225	22	45.5	90	0	
44	218	22	43.7	84	0	
45	215	22	43.4	90	0	
46	210	22	43.4	83	7	
51	231	30	43.7	132	0	
52	227	30	43.0	126	0	
53	241	30	44.7	130	0	
54	223	30	42.9	126	0	
55	224	30	43.2	130	0	
56	260	30	47.6	126	1	
61	234	35	42.4	164	0	
62	242	35	44.5	158	0	
63	260	35	46.6	156	0	
64	316	35	48.5	158	0	
65	252	35	45.8	162	0	
66	237	35	43.0	162	7	
71	259	45	44.8	209	0	
72	244	45	44.2	203	0	
73	299	45	40.6	177	0	J10
74	256	45	44.5	209	0	
75	306	45	46.2	211	0	
76	329	45	47.4	227	0	

BEST AVAILABLE COPY

ST. JOHNS RIVER POWER PARK
UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1300
Date : 11/6/95
Initials : TM

1 A (1/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC mAmps	Sparks	Comments
11	215	12	45.2	45	0	
12	211	12	44.8	45	0	
13	211	12	43.3	45	0	
14	202	12	42.6	51	0	
15	204	12	42.6	45	0	
16	200	12	42.3	43	0	
21	219	15	43.7	61	0	
22	221	15	43.3	61	0	
23	228	15	46.2	61	0	
24	218	15	43.3	61	0	
25	208	15	42.4	61	0	
26	209	15	41.9	67	0	
31	248	15	49.7	59	0	
32	245	15	49.2	59	0	
33	310	15	50.8	61	0	
34	213	15	43.0	61	0	
35	209	15	41.1	59	0	
36	206	15	41.7	61	0	
41	225	22	40.7	71	0	
42	222	22	44.0	90	0	
43	243	22	48.0	90	0	
44	214	22	42.8	86	0	
45	212	22	42.0	90	0	
46	222	22	44.8	90	0	
51	253	30	46.6	130	0	
52	251	30	46.1	130	0	
53	246	30	44.8	130	0	
54	240	30	40.7	114	0	
55	233	30	43.7	126	0	
56	242	30	45.6	130	0	
61	262	36	45.1	156	0	
62	256	36	46.2	156	0	
63	311	35	46.9	162	0	
64	310	35	47.0	158	0	
65	247	35	46.1	158	0	
66	261	35	41.9	134	0	
71	300	42	46.1	201	0	
72	251	42	44.6	143	0	
73	300	42	45.8	201	0	
74	258	42	43.5	193	0	J11
75	[illegible]	42	[illegible]	[illegible]		

BEST AVAILABLE COPY

UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Date : 11/6/95
Initials : TM

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC MAmps	Sparks	Comments
11	202	12	42.5	45	0	
12	204	12	41.2	47	0	
13	207	12	43.3	43	0	
14	212	12	44.7	45	0	
15	208	12	43.3	43	0	
16	211	12	44.5	43	0	
21	207	15	42.3	59	0	
22	214	16	42.6	63	0	
23	222	15	44.1	63	0	
24	229	15	43.2	61	0	
25	209	15	40.1	71	0	
26	217	15	42.8	61	0	
31	202	15	41.8	59	0	
32	212	15	38.9	61	0	
33	225	15	45.6	59	0	
34	234	15	46.1	63	0	
35	220	15	43.0	63	0	
36	223	15	45.9	63	0	
41	228	22	45.8	86	0	
42	225	22	45.9	86	0	
43	225	22	43.4	90	0	
44	219	22	44.1	84	0	
45	215	22	43.6	90	0	
46	217	22	43.9	86	0	
51	229	30	43.7	134	0	
52	231	30	43.4	126	0	
53	242	30	44.8	130	0	
54	223	30	43.0	126	0	
55	225	30	43.6	126	0	
56	269	31	46.0	132	7	
61	233	35	42.4	164	0	
62	242	35	44.7	158	0	
63	257	35	46.2	156	0	
64	313	35	48.1	158	0	
65	255	35	45.8	162	0	
66	252	36	44.9	158	0	
71	251	45	43.7	211	0	
72	242	45	43.8	205	0	
73	288	45	40.3	179	0	
74	254	45	44.1	209	0	J12
75	268	45	45.0	213	0	
76	319	45	46.2	225	0	

BEST AVAILABLE COPY

ST. JOHNS RIVER POWER PARK
UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1400
Date : 11/6/95
Initials : [illegible]

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC mAmps	Sparks	Comments
11	218	12	46.1	45	0	
12	215	12	44.9	45	0	
13	212	12	43.5	45	0	
14	205	12	42.8	45	0	
15	208	12	43.0	45	0	
16	202	12	42.7	45	0	
21	219	15	43.7	61	0	
22	219	15	42.8	59	0	
23	227	15	45.8	61	0	
24	217	15	43.1	61	0	
25	207	15	42.3	63	0	
26	206	15	42.2	63	0	
31	241	15	42.6	61	0	
32	248	15	49.3	61	0	
33	307	15	50.5	63	0	
34	212	15	43.0	61	0	
35	205	15	40.7	59	0	
36	208	15	41.6	61	0	
41	225	22	40.6	75	0	
42	222	22	43.8	90	0	
43	242	22	48.4	96	0	
44	215	22	42.8	86	0	
45	212	22	42.3	90	0	
46	222	22	44.7	90	0	
51	253	30	46.4	130	0	
52	249	30	45.9	130	0	
53	246	30	44.8	130	0	
54	232	30	48.6	154	0	
55	232	30	43.6	126	0	
56	242	30	45.8	130	0	
61	252	36	45.1	156	0	
62	256	35	46.3	156	0	
63	312	35	46.9	162	0	
64	309	35	46.9	158	0	
65	246	38	46.2	158	0	
66	259	38	41.9	134	0	
71	300	42	46.1	197	0	
72	252	42	44.7	197	0	
73	303	42	46.0	201	0	
74	258	42	43.4	197	0	J13
75	251	42	39.4	90	0	

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ST. JOH[illegible] [illegible]JAN PARK
UNIT 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1900
Date : 11/6/91
Initials : Tm

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC MAmps	Sparks	Comments
11	203	12	47.2	43	0	
12	202	12	41.3	51	0	
13	207	12	43.2	45	0	
14	210	12	44.4	45	0	
15	206	12	43.0	43	0	
16	209	12	44.1	43	0	
21	210	15	47.4	59	0	
22	215	15	47.2	59	0	
23	221	15	44.0	61	0	
24	226	15	45.1	61	0	
25	209	18	40.5	71	0	
26	217	15	47.7	59	0	
31	207	15	41.7	59	0	
32	211	15	38.9	61	0	
33	228	15	45.9	59	0	
34	234	15	46.0	63	0	
35	218	15	42.7	59	0	
36	223	15	45.9	59	0	
41	229	22	45.9	86	0	
42	226	22	45.9	84	0	
43	226	22	45.5	90	0	
44	219	22	44.1	83	0	
45	215	22	436	86	0	
46	217	22	437	86	0	
51	231	30	43.7	130	0	
52	229	30	43.4	126	0	
53	242	30	44.8	130	0	
54	224	30	43.0	130	0	
55	225	30	43.6	130	0	
56	257	30	47.3	126	0	
61	234	35	42.5	166	0	
62	242	35	44.7	158	0	
63	253	36	46.1	156	0	
64	307	35	47.3	167	0	
65	246	35	44.8	162	0	
66	256	36	45.3	166	7	
71	251	45	43.1	209	0	
72	242	45	43.9	209	0	
73	246	45	40.4	181	0	
74	253	45	43.9	209	0	J14
75	308	44	47.0	209	10	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

BEST AVAILABLE COPY

ST. JOHNS RIVER POWER PARK
UNIT #
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1500
Date : 11/6/95
Initials : TM

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC mAmps	Sparks	Comments
11	218	12	46.6	45	0	
12	214	12	45.1	45	0	
13	213	12	43.6	47	0	
14	204	12	43.0	45	0	
15	204	12	42.8	45	0	
16	200	12	42.5	48	0	
21	218	15	43.7	61	0	
22	218	15	46.0	61	0	
23	228	15	46.1	61	0	
24	214	15	42.9	59	0	
25	203	15	42.5	61	0	
26	209	16	42.2	67	0	
31	248	15	49.7	59	0	
32	246	15	49.4	61	0	
33	309	15	50.6	63	0	
34	213	16	43.1	61	0	
35	210	15	41.0	59	0	
36	207	15	41.5	61	0	
41	225	22	40.6	75	0	
42	222	22	43.8	86	0	
43	246	22	48.7	90	0	
44	213	22	42.8	86	0	
45	211	22	42.0	90	0	
46	222	22	44.5	90	0	
51	256	30	46.7	130	0	
52	251	30	46.2	130	0	
53	247	30	44.8	126	0	
54	236	30	40.5	114	0	
55	233	30	43.5	126	0	
56	242	30	45.6	130	0	
61	258	35	45.0	136	0	
62	258	35	46.6	154	0	
63	316	35	47.3	162	0	
64	312	35	47.2	158	0	
65	246	36	46.4	156	0	
66	304	35	42.5	138	0	
71	302	42	46.3	177	0	
72	256	42	45.1	193	0	
73	309	42	46.9	197	0	
74	259	42	43.7	193	0	J15
75	252	42	39.5	70	0	

BEST AVAILABLE COPY

HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Initials : TM

1 13 (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC mAmps	Sparks	Comments
11	204	12	42.8	45	0	
12	204	12	41.4	47	0	
13	205	12	43.1	43	0	
14	211	12	44.4	45	0	
15	209	12	43.4	43	6	
16	212	12	44.1	43	0	
21	208	16	42.3	59	0	
22	215	16	42.2	63	0	
23	221	15	43.9	61	0	
24	229	15	44.9	61	0	
25	212	16	39.5	73	0	
26	213	15	42.1	61	0	
31	206	16	41.9	61	0	
32	209	15	38.9	61	0	
33	228	18	45.9	59	0	
34	232	18	45.8	67	0	
35	218	18	42.6	63	0	
36	222	16	46.5	59	0	
41	230	22	46.0	86	0	
42	225	22	45.7	86	0	
43	227	22	45.8	90	0	
44	218	22	43.9	86	0	
45	217	22	43.7	86	0	
46	218	22	43.7	86	0	
51	230	30	43.8	130	0	
52	228	30	43.3	126	0	
53	242	30	45.0	130	0	
54	227	30	41.5	126	0	
55	224	31	43.0	126	0	
56	260	30	41.8	126	0	
61	234	35	42.6	162	0	
62	243	35	44.8	158	0	
63	261	35	46.9	156	0	
64	316	35	48.4	162	0	
65	259	36	45.9	162	0	
66	248	36	45.4	166	8	
71	261	45	44.4	213	0	
72	247	45	44.4	205	0	
73	300	45	40.9	179	0	
74	260	45	44.6	213	0	J16
75	310	45	46.1	217	6	
76	330	45	47.6	225	0	

BEST AVAILABLE COPY

ST. JOHNS RIVER POWER PARK
UNIT #
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1600
Date : 11/6/91
Initials : TM

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC MAmps	Sparks	Comments
11	218	12	46.2	47	0	
12	215	12	45.7	45	0	
13	212	12	43.6	43	0	
14	204	12	43.0	41	0	
15	201	12	42.6	45	0	
16	204	12	42.8	43	0	
21	221	15	44.0	61	0	
22	219	15	43.0	61	0	
23	228	15	46.2	61	0	
24	218	15	43.4	61	0	
25	206	15	42.8	63	0	
26	208	15	41.9	67	0	
31	248	15	49.7	59	0	
32	246	15	49.5	61	0	
33	309	15	50.8	55	0	
34	213	15	43.2	61	0	
35	206	15	41.0	59	0	
36	211	15	41.8	61	0	
41	225	22	40.8	75	0	
42	213	22	44.1	86	0	
43	245	22	48.7	90	0	
44	215	22	43.0	90	0	
45	212	22	42.4	90	0	
46	223	22	44.8	90	0	
51	254	30	46.6	130	0	
52	251	30	46.1	130	0	
53	246	30	44.8	130	0	
54	241	30	40.8	114	0	
55	235	30	44.1	126	0	
56	243	30	46.0	130	0	
61	258	35	45.1	154	0	
62	256	36	46.6	154	0	
63	317	35	42.4	162	0	
64	310	35	47.2	158	0	
65	248	35	46.6	158	0	
66	265	35	42.2	134	0	
71	302	42	46.4	199	0	
72	256	42	45.1	193	0	
73	312	42	47.0	197	0	
74	262	42	43.8	117	0	J17
75	255	42	39.7	90	0	

BEST AVAILABLE COPY

HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Date : 10/6/93
Initials : TM

1 13 (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	202	12	47.2	45	0	
12	201	12	40.9	51	0	
13	207	12	43.0	45	0	
14	208	12	44.1	45	0	
15	205	12	47.8	43	0	
16	206	12	43.6	43	0	
21	207	15	47.2	59	0	
22	211	15	47.1	61	0	
23	221	15	43.8	59	0	
24	226	15	44.5	61	0	
25	206	15	40.3	71	0	
26	213	15	47.3	61	0	
31	207	15	41.9	59	0	
32	209	15	38.7	61	0	
33	228	15	46.2	59	0	
34	314	27	49.1	110	0	
35	260	22	45.4	98	0	
36	295	21	49.0	90	0	
41	230	22	46.2	86	0	
42	226	22	45.8	86	0	
43	227	22	45.8	90	0	
44	218	22	44.2	86	0	
45	218	22	43.9	90	0	
46	216	22	44.1	90	4	
51	233	30	44.1	134	0	
52	231	30	43.6	130	0	
53	243	30	45.0	130	0	
54	222	30	43.0	126	0	
55	229	30	43.5	126	0	
56	262	30	47.9	130	0	
61	235	35	47.6	164	0	
62	245	35	44.9	158	0	
63	262	35	46.9	156	0	
64	309	35	47.7	156	0	
65	247	35	44.8	162	0	
66	251	37	46.6	162	7	
71	261	45	45.1	209	0	
72	247	45	44.4	201	0	
73	302	45	40.8	181	0	
74	258	45	44.4	209	0	J18
75	275	45	45.0	213	0	
76	319	45	45.9	223	0	

ST. JOHNS RIVER POWER PARK
UNIT # 1
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1630
Date : 11/6/95
Initials : TM

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC MAmps	Sparks	Comments
11	217	12	45.9	51	0	
12	214	12	45.5	45	0	
13	212	12	43.4	45	0	
14	205	12	43.0	51	0	
15	205	12	43.0	43	0	
16	205	12	43.7	45	0	
21	219	15	43.7	67	0	
22	218	15	43.0	59	0	
23	227	15	46.1	63	0	
24	215	15	47.9	61	0	
25	208	15	47.6	61	0	
26	209	15	47.2	67	0	
31	249	15	49.8	59	0	
32	248	15	49.5	61	0	
33	313	15	51.7	59	0	
34	222	15	43.1	61	0	
35	207	15	46.8	59	0	
36	209	15	41.6	61	0	
41	226	22	40.8	75	0	
42	224	22	44.1	90	0	
43	246	22	48.7	92	0	
44	216	22	43.0	90	0	
45	212	22	47.3	92	0	
46	224	22	44.8	90	0	
51	256	30	46.7	130	0	
52	252	30	46.3	130	0	
53	248	30	45.1	130	0	
54	240	30	40.8	114	0	
55	233	30	43.9	126	0	
56	243	30	46.0	130	0	
61	259	35	45.1	158	0	
62	255	35	46.4	154	0	
63	316	35	47.3	162	0	
64	311	35	47.2	158	0	
65	248	35	46.5	158	0	
66	299	35	41.9	138	0	
71	301	42	46.1	201	0	
72	252	42	44.6	195	0	
73	305	42	46.1	201	0	
74	256	42	43.3	195	0	J19
75	249	42	34.1	90	0	

BEST AVAILABLE COPY

HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Date : 11/ 6/ 95
Initials : TM

1 13 (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC mAmps	Sparks	Comments
11	204	12	47.5	45	0	
12	203	12	41.2	47	0	
13	205	12	47.8	45	0	
14	212	12	44.7	45	0	
15	211	13	43.4	43	0	
16	211	12	43.1	43	0	
21	209	16	47.3	55	0	
22	214	15	47.4	63	0	
23	224	15	44.4	59	0	
24	228	15	44.7	61	0	
25	209	15	405	71	0	
26	216	18	42.8	61	0	
31	209	18	47.2	61	0	
32	214	15	39.2	63	0	
33	230	18	46.4	59	0	
34	234	15	46.4	67	0	
35	224	16	43.0	67	0	
36	327	22	48.5	90	0	
41	229	22	46.0	86	0	
42	228	22	45.9	84	0	
43	228	22	46.9	90	0	
44	219	22	44.1	86	0	
45	217	22	43.8	86	0	
46	209	23	16.0	90	7	
51	232	30	44.1	134	0	
52	230	30	43.5	126	0	
53	243	30	45.1	130	0	
54	224	30	41.8	116	0	
55	226	30	43.7	126	0	
56	259	30	47.8	126	0	
61	238	35	42.7	166	0	
62	245	35	45.0	156	0	
63	258	35	46.8	156	0	
64	310	35	47.8	158	0	
65	251	35	45.4	162	0	
66	222	31	41.1	134	14	
71	255	48	44.2	213	0	
72	245	46	44.1	203	0	
73	248	46	40.6	181	0	
74	256	45	44.2	211	0	J20
75	305	45	46.0	213	0	
76	327	16	48.0	225	0	

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # ONE

DATE: 11.3.95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		DS	DS	DS	DS	DS	DS
Time		2200	2230	2300	2330	2400	0030
Steam Flow	LB/HR x 10^6	2056	2008	2.086	2093	2093	2.153
Air Flow	%	51	50	51	51	51	51
Generator Load (Gross)	Megawatts	304	292	290	301	292	305
Boiler Thermal Demand	Megawatts	286	280	278	288	275	289
O_2 Flue Gas	%	5.6	5.6	5.45	5.3	5.5	5.2
Fuel Flow	%	52	52	52	52	52	52
Coal Totalizer	Tons						
A		0	0	0	0	0	0
B		66	66	66	67	66	67
C		68	69	68	68	68	68
D		64	64	66	66	65	64
E		0	0	0	0	0	0
F		0	0	0	0	0	0
G		62	63	61	61	61	61

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # ONE

DATE: 11·4·95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		DS	DS	DS	DS	DS	DS
Time		0100	0130	0200	0230	0300	0330
Steam Flow	LB/HR x 10^6	2,042	2.101	2.056	2.181	2.038	2.169
Air Flow	%	50	51	51	51	51	50
Generator Load (Gross)	Megawatts	302	304	293	309	293	303
Boiler Thermal Demand	Megawatts	286	284	279	291	279	286
O_2 Flue Gas	%	5.0	5.2	5.4	5.2	5.2	5.2
Fuel Flow	%	52	52	52	52	52	52
Coal Totalizer	Tons						
A		0	0	0	0	0	0
B		67	66	66	68	67	67
C		68	69	68	68	68	68
D		65	65	66	65	66	66
E		0	0	0	0	0	0
F		0	0	0	0	0	0
G		61	61	61	61	61	61

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # ONE

DATE: 11·4·95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		DS	DS	DS	DS	EGP	EGP
Time		0400	0430	0500	0530	0600	0630
Steam Flow	LB/HR x 10^6	N	N	3.29	3.36	3.33	3.33
Air Flow	%	O	O	67	67	67	67
Generator Load (Gross)	Megawatts	T	T	478	480	480	482
Boiler Thermal Demand	Megawatts	T	T	447	452	444	451
O_2 Flue Gas	%	E	E	3.25	3.12	3.5	3.5
Fuel Flow	%	S	S	79	79	79	79
Coal Totalizer	Tons	T I	T I				
A		N	N	0	0	0	0
B		G	G	74	73	73	74
C				84	83	84	82
D				78	78	78	77
E				76	77	76	76
F				0	0	0	0
G				83	83	83	83

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # ONE

DATE: 11-4-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		EAP	EAP	EAP	EAP	EAP	EAP
Time		0700	0730	0800	0830	0900	0930
Steam Flow	LB/HR x 10^6	3.27	3.30	3.27	3.30	3.27	3.26
Air Flow	%	68	67	67	68	67	71
Generator Load (Gross)	Megawatts	480	483	478	480	478	478
Boiler Thermal Demand	Megawatts	447	452	444	447	445	446
O_2 Flue Gas	%	3.5	3.8	3.7	3.7	3.8	4.3
Fuel Flow	%	79	79	79	79	79	83
Coal Totalizer	Tons						
A		0	0	0	0	0	0
B		73	73	73	73	73	73
C		83	83	83	83	83	82
D		78	78	78	78	79	79
E		77	76	77	77	77	77
F		0	0	0	0	0	0
G		83	84	84	84	84	83

Total fuel went up at 0930 due to ignitor guns going in service in preparation of putting additional pulverizer in service for load increase

EAP

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # One

DATE: 11-4-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		EAP					
Time		1000					
Steam Flow	LB/HR x 10^6	3.34					
Air Flow	%	66					
Generator Load (Gross)	Megawatts	450					
Boiler Thermal Demand	Megawatts	456					
O_2 Flue Gas	%	3.7					
Fuel Flow	%	85					
Coal Totalizer	Tons						
A		0					
B		79					
C		81					
D		81					
E		82					
F		0					
G		82					

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # ONE

DATE: 11-6-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data							
Time		0800	0830	0900	0930	1000	1030
Steam Flow	LB/HR x 10^6	4.55	4.52	4.55	4.54	4.55	4.57
Air Flow	%	86.7	86.6	87.3	85.8	88.5	88.6
Generator Load (Gross)	Megawatts	658	659	657	657	658	657
Boiler Thermal Demand	Megawatts	617	617	619	620	618	618
O_2 Flue Gas	%	3.2	3.1	3.2	3.2	3.0	3.3
Fuel Flow	%	104	103	103	103	103	103
Coal Totalizer	Tons						
A		77	76	73	72	72	74
B		72	72	74	73	73	71
C		73	73	73	73	72	72
D		73	73	73	73	72	83
E		76	76	73	73	72	75
F		71	71	73	73	72	70
G		74	74	72	72	73	74

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # ONE

DATE: 11-6-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Time		1100	1130	1200	1230	1300	1330
Steam Flow	LB/HR x 10^6	4.55	4.57	4.55	4.56	4.60	4.56
Air Flow	%	87.1	88.7	88.6	90.2	89.0	90.3
Generator Load (Gross)	Megawatts	659	659	657	658	658	660
Boiler Thermal Demand	Megawatts	623	619	620	618	624	617
O_2 Flue Gas	%	2.8	2.7	3.4	3.1	2.8	3.1
Fuel Flow	%	102	104	102	104	103	104
Coal Totalizer	Tons						
A		69	71	71	71	70	72
B		71	73	72	73	72	73
C		70	79	82	73	71	72
D		82	71	71	72	71	72
E		70	80	71	73	71	73
F		70	72	71	83	83	73
G		69	71	71	74	72	73

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # ONE

DATE: 11-6-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data							
Time		1400	1430	1500	1530	1600	1630
Steam Flow	LB/HR x 10^6	4.56	4.57	4.55	4.56	4.58	4.59
Air Flow	%	88.0	89.2	88.8	88.5	89.4	89.8
Generator Load (Gross)	Megawatts	659	658	659	657	659	658
Boiler Thermal Demand	Megawatts	625	619	621	620	623	623
O_2 Flue Gas	%	3.1	3.1	3.1	3.3	3.1	3.0
Fuel Flow	%	103	104	103	103	1.03	104
Coal Totalizer	Tons						
A		72	72	73	73	72	72
B		74	74	74	74	73	73
C		73	73	73	74	72	72
D		72	73	73	73	72	72
E		72	73	73	73	72	72
F		72	73	73	74	72	73
G		72	74	72	73	72	72

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # 1

DATE: 11-7-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		EA	EA	EA	EA	EA	EA
Time		0800	0830	0900	0930	1000	1030
Steam Flow	LB/HR x 10^6	4.55	4.55	4.53	4.53	4.53	4.55
Air Flow	%	88.3	88.5	88.3	87.9	88.5	89.1
Generator Load (Gross)	Megawatts	658	658	658	656	658	658
Boiler Thermal Demand	Megawatts	621	621	619	614	614	620
O_2 Flue Gas	%	3.0	3.2	3.0	3.2	3.2	3.1
Fuel Flow	%	102.2	102.4	102.8	102.5	102.7	102.7
Coal Totalizer	Tons						
A		72	73	72	71	72	73
B		73	72	74	72	73	74
C		73	73	73	71	72	73
D		72	72	72	71	72	73
E		72	72	73	71	72	73
F		72	72	73	71	72	73
G		72	73	72	72	72	72

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # 1

DATE: 11-7-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		EA	EA	EA	EA	EA	EA
Time		1100	1130	1200	1230	1300	1330
Steam Flow	LB/HR x 10^6	4.54	4.53	4.56	4.57	4.54	4.52
Air Flow	%	87.8	87.9	88.9	89.7	88.2	87.5
Generator Load (Gross)	Megawatts	657	657	658	656	656	657
Boiler Thermal Demand	Megawatts	617	617	621	621	618	614
O_2 Flue Gas	%	3.0	3.3	3.1	3.0	3.3	3.3
Fuel Flow	%	103.2	102.6	102.6	103	102.3	103.6
Coal Totalizer	Tons						
A		73	72	73	72	72	73
B		74	74	74	73	74	74
C		74	73	73	73	73	73
D		73	73	73	72	72	73
E		73	72	73	73	73	73
F		73	73	73	73	73	73
G		72	72	72	72	72	73

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # 1

DATE: 11-7-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data							
Time		1400	1430	1500	1530	1600	1630
Steam Flow	LB/HR x 10^6	4.59	4.56	4.61	4.57	4.56	4.56
Air Flow	%	90.5	90.7	90.8	89.6	89.6	90.5
Generator Load (Gross)	Megawatts	657	657	658	658	657	657
Boiler Thermal Demand	Megawatts	624	619	624	626	623	623
O_2 Flue Gas	%	3.0	3.2	3.0	3.2	3.0	3.1
Fuel Flow	%	102.8	105	103.8	103.8	105.1	104.6
Coal Totalizer	Tons						
A		73	73	73	75	73	72
B		74	74	74	76	75	74
C		73	73	73	75	74	73
D		73	73	73	75	73	73
E		73	73	73	75	74	73
F		73	73	73	75	74	73
G		71	71	71	71	71	71

st. johns river OWER ARK

FLUE GAS DESULFURIZATION OPERATIONAL PARAMETERS

FGD Unit # 1

DATE: 10/31/95

Hour	PACKING DIFFERENTIAL PRESSURE (inches H20 column)			
	A	B	C	
0000				
0100				
0200				
0300				
0400				
0500				
0600				
0700	O/S	.97	1	T.D.
0800	O/S	.95	1	T.D.
0900	O/S	.95	1	T.D.
1000	O/S	1	1	T.D.
1100	O/S	1	1	T.D.
1200	O/S	1	1.10	T.D.
1300	O/S	1	1.10	T.D.
1400	O/S	1	1.10	T.D.
1500	O/S	1	1.10	T.D.
1600	O/S	1	1.10	T.D.
1700				
1800				
1900				
2000				
2100				
2200				
2300				

Daily System Water Use: ________(Total Gallons) / 1440 (min/day) = _____GPM

COMMENTS: ____

Pollution Monitor Daily Report V4.1 11/06/1995 Page # 1

Company: St. Johns Unit 1 Location:

Source : Unit 1 Channel : 1Opacity Units: %

00:00	5.5	13.6IC	14.0IC	5.3	5.5	5.7	5.3	5.3	5.0	5.2	Avg:	5.
01:00	5.3	5.4	5.8	6.0	5.2	4.9	5.2	5.4	5.3	4.9	Avg:	5.
02:00	4.8	5.0	4.6	5.9	4.8	4.8	4.8	4.3	4.8	5.1	Avg:	4.
03:00	4.9	5.4	4.5	5.7	5.1	5.1	5.0	5.0	5.2	4.9	Avg:	5.
04:00	5.0	5.3	5.8	6.1	5.1	5.0	5.2	5.0	5.0	5.1	Avg:	5.
05:00	4.9	5.0	5.7	5.5	5.6	5.2	5.4	5.4	5.2	5.6	Avg:	5.
06:00	5.3	5.5	5.2	5.3	4.8	4.8	4.9	4.7	4.6	4.3	Avg:	4.
07:00	4.4	4.9	4.8	5.2	4.7	4.6	4.5	4.9	4.7	5.0	Avg:	4.
08:00	5.0	4.7	4.6	5.6	4.8	4.6	4.8	4.6	4.8	4.6	Avg:	4.
09:00	4.8	5.1	4.9	5.5	4.5	4.8	4.8	4.5	4.7	4.6	Avg:	4.
10:00	4.9	4.7	4.8	5.6	4.8	4.8	4.8	4.7	4.8	4.6	Avg:	4.
11:00	4.8	4.7	5.3	5.0	4.7	4.8	5.0	5.1	4.7	5.0	Avg:	4.
12:00	4.9	5.1	5.7	5.0	4.8	4.9	4.8	4.9	5.0	5.0	Avg:	5.
13:00	4.8	4.8	5.4	5.1	4.8	4.6	4.8	4.4	4.6	4.6	Avg:	4.
14:00	4.7	5.1	5.5	5.1	4.7	5.0	4.9	4.9	5.2	4.8	Avg:	5.
15:00	4.8	5.1	4.9	5.3	4.6	5.0	4.9	5.6	5.7	5.6	Avg:	5.
16:00	5.8	5.7	5.3	5.4	5.3	5.5	5.5ND	**ND	**ND	**ND	Avg:	5.
17:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
18:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
19:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
20:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
21:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
22:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
23:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		

Daily Average: 5.0 Count: 164 Max: 6.1

BEST AVAILABLE COPY

ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 0800
Date : 11/7/95
Initials : TCS

1 A (A/B)

Rectifier Set	AC ~~Volts~~ AMP	AC ~~Amps~~ VOLTS	DC ~~mAmps~~ AMPS	DC ~~Amps~~ KV	Sparks	Comments
11	12	206	50	40.3	—	* NOTE: DC AMP
12	12	205	51	40.8	—	KV READINGS
13	12	214	43	38.2	—	AC AMP | KV
14	12	214	51	43.3	—	READINGS
15	12	197	45	39.1	-	
16	12	202	51	40.7	—	
21	12	208	51	41.7	—	
22	12	214	51	41.9		
23	12	218	45	44.4		
24	12	225	51	44.2		
25	12	197	51	39.7		
26	12	215	51	41.9		
31	12	218	45	43.4		
32	12	209	51	41.6		
33	12	211	43	42.7		
34	12	215	51	43.1		
35	12	200	45	40.9		
36	12	215	51	43.1		
41	25	237	106	45.9		
42	25	231	106	39.2		
43	25	231	102	44.5		
44	25	227	104	43.7		
45	25	234	106	44.4		
46	25	236	106	45.7		
51	25	236	106	44.3		
52	25	232	106	44.9		
53	25	228	106	43.2		
54	25	210	102	40.1		
55	25	213	106	41.2		
56	25	216	106	41.9		
61	30	252	134	46.2		
62	30	239	130	44.0	03	
63	30	229	130	37.3		
64	30	216	130	40.5		
65	30	229	130	40.3		
66	30	217	126	41.6		
71	40	302	181	46.5		
72	40	242	195	42.4		
73	40	259	185	42.7		
74	40	233	145	41.[illegible]		J34

BEST AVAILABLE COPY

UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Date : 11/7/95
Initials : LCS

1 B (A/B)

Rectifier Set	AC ~~Volts~~ Amps	AC ~~Amps~~ Volts	DC ~~kV~~ mA	DC ~~Amps~~ kV	Sparks	Comments
11	14	212	59	405		
12	14	214	59	426		# ✓ READINGS
13	14	218	54	425		
14	14	209	61	363		
15	14	204	59	40.6		
16	14	208	59	40.4		
21	12	209	51	41.6		
22	12	203	51	40.7		
23	12	211	51	41.4		
24	12	218	45	42.9		
25	12	20[illegible]	45	40.5		
26	12	201	51	37.4		
31	12	205	51	41.7		
32	12	199	51	39.5		
33	12	199	51	39.8		
34	12	209	45	42.5		
35	12	202	47	41.2		
36	12	212	77	39.4		
41	20	211	79	42.5		
42	20	213	77	44.1		
43	20	212	79	42.1		
44	20	203	77	42.6		
45	20	213	79	42.8		
46	20	219	77	44.6		
51	25	220	106	43.0		
52	25	219	106	40.9		
53	25	225	106	43.4		
54	20	213	79	43.6		
55	25	239	106	45.7		
56	25	233	106	45.7		
61	30	219	130	40.5		
62	30	219	130	39		
63	30	223	130	41.7		
64	30	243	138	43.7		
65	30	238	126	43.5		
66	30	232	126	45.2		
71	40	232	135	40.9		
72	40	242	185	41.2		
73	40	228	177	41.0		
74	22	~~110~~ 83	67	19.6	31	J35
75	40	310	187	45.[illegible]		
76	40	317	103	46.0		

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ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 0900
Date : 11/7/95
Initials : LCS

1 A (A/B)

Rectifier Set	AC ~~Volts~~ Amps	AC ~~Amps~~ Volts	DC ~~KV~~ Amps	DC ~~Amps~~ KV	Sparks	Comments
11	12	208	51	40.1		✓ READINGS
12	12	207	51	40.5		
13	12	212	43	37.5		
14	12	203	51	41.9		
15	12	191	45	38.4		
16	12	205	51	40.1		
21	12	204	51	42.3		
22	12	214	51	42.2		
23	12	219	45	44.3		
24	12	224	51	44.1		
25	12	198	47	37.8		
26	12	216	51	42.1		
31	12	220	45	44.2		
32	12	211	45	41.9		
33	12	213	47	43.1		
34	12	215	51	43.1		
35	12	202	47	41.4		
36	12	216	48	43.4		
41	25	238	102	46.2		
42	25	232	102	35.4		
43	25	233	102	44.8		
44	25	228	103	43.8		
45	25	234	102	44.5		
46	25	236	106	45.8		
51	25	236	102	44.4		
52	25	232	102	45.0		
53	25	228	106	43.4		
54	25	211	106	40.4		
55	25	214	106	41.2		
56	25	218	106	42.2		
61	30	254	134	46.6		
62	30	239	130	44.1		
63	30	229	130	37.3		
64	30	217	130	40.7		
65	30	228	130	41.1		
66	30	219	130	41.9		
71	40	306	185	46.7		
72	40	243	185	42.5		
73	40	263	185	43.9		
74	40	234	181	41.8		

ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
BEST AVAILABLE COPY PRECIPITATOR ELECTRICAL DATA

Time : 0900
Date : 11/7/95
Initials : LCS

1 B (A/B)

Rectifier Set	AC ~~Volts~~ Amps	AC ~~Amps~~ Volts	DC Kv	DC Amps	Sparks	Comments
11	14	210	40.1	57		✓ Readings
12	14	212	41.4	59		
13	14	215	41.9	59		
14	14	208	35.8	61		
15	14	202	40.2	59		
16	14	205	40	59		
21	12	211	41.7	51		
22	12	204	40.8	57		
23	12	211	41.5	51		
24	12	217	42.1	45		
25	12	204	40.6	45		
26	12	201	39.4	51		
31	12	205	41.2	51		
32	12	199	39.5	51		
33	12	199	39.8	51		
34	12	204	42.5	45		
35	12	204	41.2	51		
36	12	213	39.4	77		
41	20	214	42.6	77		
42	20	214	44.2	75		
43	22	213	42.9	77		
44	20	204	42.6	75		
45	20	214	42.9	77		
46	20	219	44.8	77		
51	25	224	43.0	102		
52	25	219	41.0	106		
53	25	225	43.4	102		
54	20	214	43.6	79		
55	25	239	45.8	106		
56	25	233	45.8	106		
61	30	222	40.8	130		
62	30	221	39.2	134		
63	30	225	41.8	134		
64	30	245	43.7	140		
65	30	239	43.6	130		
66	30	230	126	45.0		
71	40	233	41.0	185		
72	40	244	41.5	187		
73	40	229	43.1	177		
74	22	100	20.8	102	30	J37
75	40	310	45.5	185		
76	40	319	46.0	187		

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ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1060
Date : 11/7/95
Initials : [illegible]

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	204	12	39.9	51		
12	204	12	40.2	51		
13	210	12	37.6	43		
14	208	12	41.9	51		
15	192	12	38.7	45		
16	200	12	40.1	47		
21	211	12	42.7	47		
22	215	12	42.7	47		
23	221	12	44.2	45		
24	225	12	44.4	47		
25	200	12	40.1	51		
26	215	12	42.2	51		
31	222	12	41.4	47		
32	213	12	42.6	51		
33	216	12	47.7	44		
34	218	12	47.8	47		
35	204	12	41.8	47		
36	218	12	44.0	45		
41	241	25	46.7	106		
42	234	25	39.7	106		
43	235	25	45.2	102		
44	230	25	44.2	106		
45	237	25	45.1	106		
46	239	25	46.0	106		
51	239	25	44.8	106		
52	234	25	45.2	102		
53	229	25	47.7	106		
54	212	25	40.6	102		
55	214	25	41.5	106		
56	219	25	42.6	106		
61	255	30	46.7	130		
62	240	30	44.4	130	01	
63	226	31	37.3	130		
64	218	30	40.8	126		
65	231	30	41.2	130		
66	220	30	42.0	130		
71	307	40	46.9	185		
72	245	40	42.7	185		
73	265	40	43.1	181		
74	235	40	42.1	185		
75	[illegible]	[illegible]	[illegible]	[illegible]		

J38

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UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Date : 10/7/91
Initials : LCS

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	211	14	40.1	59		
12	212	14	41.4	54		
13	211	14	41.4	55		
14	205	14	35.6	61		
15	205	14	40.9	55		
16	204	14	39.8	55		
21	212	12	42.2	47		
22	207	12	41.2	51		
23	212	12	41.0	51		
24	219	12	42.9	45		
25	204	12	40.7	47		
26	202	12	39.6	51		
31	203	12	42.3	51		
32	200	12	39.8	51		
33	201	12	40.0	51		
34	211	12	42.5	45		
35	204	12	41.4	51		
36	214	12	39.4	79		
41	215	20	42.8	77		
42	216	20	44.7	77		
43	214	20	43.1	77		
44	204	20	42.8	75		
45	214	20	43.0	77		
46	219	20	44.8	75		
51	225	25	42.4	106		
52	219	25	41.1	106		
53	226	25	43.7	102		
54	214	20	42.7	77		
55	240	25	45.9	106		
56	233	25	45.9	110		
61	220	30	40.7	130		
62	222	30	39.7	134		
63	226	30	42.0	132		
64	246	30	43.9	138		
65	240	30	43.7	126		
66	231	30	45.5	126		
71	234	40	41.1	185		
72	242	40	41.5	185		
73	229	40	43.2	177		
74	134	22	19.7	106	30	J39
75	312	40	45.5	185		
76	320	40	46.1	185		

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ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1100
Date : 11/7/95
Initials : LCS

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	207	12	39.4	51		
12	201	12	39.8	51		
13	209	12	37.2	43		
14	205	12	41.1	51		
15	194	12	33.9	45		
16	198	12	39.7	45		
21	211	12	426	47		
22	215	12	403	47		
23	220	12	417	45		
24	225	12	44.6	47		
25	200	12	40.4	51		
26	217	12	423	51		
31	225	12	448	43		
32	213	12	42.6	47		
33	217	12	47.9	43		
34	219	12	441	51		
35	205	12	42.2	47		
36	218	12	44.1	45		
41	242	25	46.9	102		
42	235	25	40.0	106		
43	236	25	455	102		
44	231	25	44.4	106		
45	234	25	452	106		
46	244	25	46.3	110		
51	240	25	450	105		
52	236	25	43.1	106		
53	231	25	47.9	102		
54	214	25	408	106		
55	216	25	417	106		
56	220	25	42.6	105		
61	256	30	47.0	130		
62	244	30	44.8	130		
63	237	30	38.0	130		
64	218	30	40.9	130		
65	231	30	41.4	130		
66	221	30	42.2	130		
71	310	40	47.2	185		
72	246	40	47.0	187		
73	272	40	43.5	181		
74	235	40	42.0	181		J40

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UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1100
Date : 11/7/93
Initials : ccc

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	206	14	40.0	59		
12	209	14	40.9	55		
13	209	14	41.1	55		
14	200	14	35.1	61		
15	197	14	39.3	55		
16	204	14	39.4	59		
21	212	12	42.2	47		
22	208	12	416	51		
23	214	12	420	51		
24	221	12	435	47		
25	205	12	40.9	47		
26	204	12	39.7	51		
31	209	12	42.3	51		
32	202	12	40.1	51		
33	202	12	40.[illegible]	51		
34	211	12	430	45		
35	206	12	41.9	51		
36	212	12	42.0	83		
41	218	20	43.1	77		
42	217	20	448	77		
43	215	20	433	77		
44	205	20	42.9	75		
45	215	20	432	75		
46	221	20	45.0	75		
51	224	25	43.1	102		
52	221	25	412	106		
53	226	25	437	106		
54	215	20	44.0	77		
55	241	25	461	102		
56	235	25	462	110		
61	223	30	40.9	130		
62	222	30	39.4	134		
63	232	30	42.1	130		
64	246	30	44.1	138		
65	241	30	47.9	136		
66	251	30	45.6	126		
71	2[illegible]4	40	417	185		
72	24[illegible]	40	416	185		
73	221	40	433	177		
74	[illegible]45	21	[illegible]8.2	77	30	J41
75	313	40	456	181		
76	319	40	460	185		

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ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1200
Date : 11/7/95
Initials : LCS

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	199	12	38.3	51		
12	199	12	38.9	51		
13	209	12	38.5	47		
14	199	12	40.2	51		
15	185	12	37.2	42		
16	193	12	38.6	51		
21	217	12	42.3	51		
22	217	12	42.3	51		
23	221	12	44.7	47		
24	225	12	44.7	51		
25	199	12	40.1	51		
26	216	12	42.7	55		
31	227	12	45.3	43		
32	217	12	43.3	43		
33	221	12	44.4	45		
34	220	12	40.5	47		
35	207	12	42.6	47		
36	222	12	44.5	51		
41	243	25	47.3	106		
42	237	25	40.1	107		
43	239	25	45.9	102		
44	234	25	44.8	106		
45	241	25	45.8	106		
46	241	25	46.6	110		
51	241	25	45.3	106		
52	238	25	46.0	102		
53	233	25	44.4	106		
54	216	25	41.2	106		
55	217	25	42.0	102		
56	222	25	43.0	106		
61	259	30	47.3	107		
62	243	30	45.0	130		
63	241	30	38.4	130		
64	219	30	41.2	130		
65	232	30	41.6	130		
66	222	30	42.3	130		
71	312	40	47.3	185		
72	246	40	47.0	185		
73	249	40	47.7	181		
74	272	40	47.9	185		J42
75	250	40	47.5	189		

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ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1200
Date : 11/7/95
Initials : LCS

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	201	15	388	59		
12	207	14	409	57		
13	207	14	40.6	59		
14	204	14	351	61		
15	200	14	398	59		
16	201	14	38.2	59		
21	214	12	42.8	47		
22	209	12	41.8	47		
23	214	12	428	51		
24	222	12	439	45		
25	210	12	419	47		
26	205	12	401	47		
31	213	12	43.1	47		
32	206	12	40.9	51		
33	207	12	412	51		
34	215	12	436	45		
35	208	12	42.3	45		
36	219	12	40.4	79		
41	219	20	436	75		
42	220	20	45.5	79		
43	218	20	44.0	77		
44	206	20	422	75		
45	218	20	43.7	77		
46	224	20	45.7	79		
51	225	25	436	102		
52	222	25	41.6	106		
53	228	25	44.1	106		
54	218	20	44.4	79		
55	242	25	46.3	102		
56	225	25	46.3	110		
61	223	30	41.1	130		
62	223	30	39.4	134		
63	221	30	42.2	130		
64	247	30	44.2	128		
65	242	30	44.2	130		
66	230	30	45.9	126		
71	235	40	412	185		
72	244	40	416	185		
73	232	40	43.4	181		J43
74	126	18	20.1	75	31	
75	314	40	45.9	185		
76	[illegible]	[illegible]	[illegible]	[illegible]		

ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1300
Date : 11/7/95
Initials : LCS

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	191	12	378	51		
12	195	12	386	51		
13	202	12	36.1	43		
14	197	12	397	51		
15	180	12	36.5	43		
16	191	12	382	47		
21	211	12	424	51		
22	218	12	428	51		
23	225	12	482	47		
24	228	12	452	47		
25	201	12	41.2	47		
26	218	12	426	51		
31	228	12	455	43		
32	217	12	434	51		
33	221	12	44.5	47		
34	220	12	44.6	47		
35	207	12	425	47		
36	222	12	44.7	47		
41	246	25	426	102		
42	238	25	40.3	106		
43	239	25	45.9	102		
44	234	25	45.0	106		
45	242	25	45.9	106		
46	242	25	46.6	106		
51	241	25	455	102		
52	239	25	46.1	102		
53	234	25	445	102		
54	217	25	41.2	106		
55	218	25	42.2	106		
56	222	25	43.2	106		
61	260	30	47.5	130		
62	247	30	45.3	134		
63	239	30	38.4	130		
64	219	30	41.2	126		
65	233	30	41.6	130		
66	222	30	42.5	130		
71	307	40	47.3	185		
72	248	40	437	187		
73	306	40	43.8	185		J44
74	[illegible]	[illegible]	[illegible]	[illegible]		

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ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1300
Date : 11/7/93
Initials : LCS

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	204	14	38.4	63		
12	205	14	40.0	59		
13	202	14	40.0	59		
14	199	14	34.6	63		
15	198	14	38.6	59		
16	196	14	38.6	59		
21	215	12	425	51		
22	209	12	41.7	47		
23	215	12	425	51		
24	222	12	439	47		
25	208	12	41.0	51		
26	204	12	401	51		
31	212	12	431	47		
32	205	12	407	51		
33	206	12	41.0	51		
34	215	12	437	45		
35	208	12	42.3	47		
36	219	12	40.4	53		
41	219	20	436	71		
42	221	20	456	79		
43	219	20	441	77		
44	206	20	433	75		
45	218	20	438	77		
46	225	20	45.7	79		
51	227	25	437	102		
52	224	25	41.8	106		
53	230	25	444	102		
54	219	20	44.5	77		
55	243	25	46.6	102		
56	236	25	46.5	106		
61	224	30	41.1	130		
62	222	30	39.6	132		
63	225	30	42.4	130		
64	248	30	444	138		
65	243	30	44.3	130		
66	233	30	459	126		
71	234	40	414	185		
72	245	40	417	185		
73	236	40	47.6	181		
74	[illegible]	22	205	82	31	J45
75	314	40	45.9	185		
76	[illegible]	40	465	185		

ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1400
Date : 11/7/95
Initials : LES

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	202	12	39.7	51		
12	202	12	40.1	51		
13	208	12	37.5	43		
14	200	12	40.5	51		
15	187	12	37.8	49		
16	193	12	39.2	47		
21	212	12	42.6	51		
22	218	12	42.9	51		
23	223	12	45.8	47		
24	229	12	45.2	51		
25	204	12	40.9	51		
26	219	12	42.7	55		
31	229	12	45.7	43		
32	218	12	43.7	47		
33	221	12	44.8	47		
34	222	12	45.1	47		
35	208	12	43.0	47		
36	224	12	45.0	47		
41	246	25	47.6	102		
42	238	25	40.4	106		
43	239	25	46.1	102		
44	235	25	45.1	106		
45	242	25	46.0	102		
46	242	25	46.7	106		
51	242	25	45.5	102		
52	239	25	46.2	102		
53	234	25	44.5	102		
54	217	25	41.2	106		
55	218	25	42.2	106		
56	222	25	43.1	106		
61	262	30	47.5	130		
62	247	30	45.4	130		
63	237	30	38.4	130		
64	219	30	41.4	130		
65	222	30	41.6	130		
66	222	30	42.3	130		
71	310	40	47.3	181		
72	248	40	43.3	189		
73	300	40	43.7	185		
74	236	40	42.3	[illegible]		J46

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ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1400
Date : 11/7/83
Initials : [illegible]

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	204	14	39.4	59		
12	204	14	40.1	55		
13	209	14	41.7	59		
14	205	14	35.3	63		
15	196	14	39.2	59		
16	204	14	39.0	59		
21	218	12	43.3	51		
22	211	12	42.1	45		
23	215	12	42.5	51		
24	226	12	45.2	53		
25	209	12	41.7	47		
26	205	12	40.1	47		
31	214	12	43.4	47		
32	207	12	41.2	51		
33	203	12	41.6	51		
34	215	12	43.8	43		
35	211	12	42.8	47		
36	222	12	41.2	79		
41	220	20	44.0	77		
42	222	20	45.9	75		
43	221	20	44.4	77		
44	207	20	43.4	75		
45	219	20	44.1	77		
46	226	20	46.1	79		
51	221	25	44.1	106		
52	224	25	41.9	106		
53	229	25	44.4	106		
54	219	20	44.7	79		
55	243	25	46.6	102		
56	236	25	46.6	106		
61	224	30	41.1	130		
62	224	30	39.6	134		
63	229	30	42.4	130		
64	248	30	44.4	138		
65	243	30	44.4	130		
66	232	30	46.0	122		
71	235	40	41.4	185		
72	245	40	41.7	185		
73	232	40	43.2	181		
74	127	18	83	20.6	30	J47
75	315	40	46.0	185		
76	323	40	41.6	145		

BEST AVAILABLE COPY

ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1500
Date : 11/7/95
Initials : LCS

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	195	12	37.6	51		
12	199	12	39.2	51		
13	204	12	36.2	43		
14	200	12	39.5	51		
15	182	12	36.9	47		
16	188	12	38.1	47		
21	211	12	42.3	51		
22	218	12	43.1	51		
23	225	12	45.2	47		
24	229	12	45.2	51		
25	202	12	41.2	51		
26	219	12	42.0	51		
31	231	12	46.1	43		
32	219	12	51	43.6		
33	222	12	44.9	47		
34	225	12	45.4	51		
35	208	12	43.0	47		
36	225	12	45.3	47		
41	246	25	48.7	106		
42	240	25	40.6	106		
43	241	25	46.2	102		
44	236	25	45.4	106		
45	242	25	46.1	102		
46	242	25	46.8	106		
51	243	25	45.7	106		
52	239	25	46.2	102		
53	234	25	44.6	102		
54	217	25	41.3	106		
55	219	25	42.3	106		
56	224	25	43.4	106		
61	261	30	47.6	122		
62	249	30	45.4	134		
63	241	32	38.4	134		
64	221	31	41.4	126		
65	223	30	41.7	130		
66	222	30	42.5	130		
71	312	46	47.4	185		
72	249	40	43.4	189		
73	301	40	43.9	181		J48
74	228	40	40.4	185		

BEST AVAILABLE COPY

ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1500
Date : 11/7/95
Initials : [illegible]

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	205	15	38.6	59		
12	200	14	39.5	59		
13	205	14	41.2	55		
14	251	14	34.7	63		
15	195	14	38.7	59		
16	195	14	38.3	59		
21	217	12	42.9	51		
22	211	12	42.0	47		
23	215	12	42.4	51		
24	225	12	44.4	47		
25	207	12	41.6	47		
26	205	12	40.5	47		
31	214	12	43.4	47		
32	207	12	41.2	51		
33	208	12	41.6	51		
34	219	12	44.1	47		
35	211	12	42.8	47		
36	221	12	40.8	83		
41	222	20	44.2	77		
42	224	20	46.2	79		
43	221	20	44.6	79		
44	207	20	43.5	73		
45	219	20	44.2	77		
46	225	20	45.9	79		
51	224	25	44.1	106		
52	224	25	41.9	106		
53	220	25	44.5	102		
54	219	20	44.9	79		
55	243	25	46.6	102		
56	238	25	46.9	110		
61	224	30	41.3	130		
62	224	30	39.7	134		
63	227	30	42.4	130		
64	248	30	44.5	138		
65	244	30	44.5	130		
66	232	30	46.2	124		
71	235	40	41.4	185		
72	246	40	41.8	185		
73	232	40	42.6	177		
74	117 ~~225~~	~~40~~ 15	22.5	85	31	J49
75	215	40	46.8	185		
76	[illegible]	[illegible]	[illegible]	[illegible]		

BEST AVAILABLE COPY

ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1600
Date : 11/7/95
Initials : LCS

1 A (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	197	12	38.4	51		
12	196	12	39.0	51		
13	208	12	36.9	43		
14	200	12	40.8	51		
15	187	12	37.8	43		
16	198	12	39.8	47		
21	211	12	42.7	51		
22	218	12	42.8	51		
23	224	12	46.1	47		
24	229	12	45.2	51		
25	202	12	40.8	51		
26	219	12	43.0	51		
31	230	12	45.8	45		
32	220	12	43.7	51		
33	222	12	45.0	47		
34	225	12	46.6	51		
35	209	12	43.1	47		
36	225	12	45.4	47		
41	246	25	47.7	106		
42	238	25	40.4	106		
43	239	25	46.1	102		
44	235	25	45.2	106		
45	242	25	46.2	102		
46	247	25	46.9	106		
51	243	25	45.6	106		
52	239	25	46.2	102		
53	234	25	106	44.5		
54	217	25	41.3	106		
55	219	25	42.2	106		
56	224	25	47.3	106		
61	260	30	47.6	134		
62	248	30	45.3	134		
63	238	30	38.4	130		
64	219	30	41.3	130		
65	232	30	41.6	126		
66	222	30	42.5	130		
71	311	40	47.3	185		
72	248	40	43.4	189		
73	300	40	43.8	185		
74	236	40	47.3	185		J50

BEST AVAILABLE COPY

ST. JOHNS RIVER POWER PARK
UNIT # 2
HOUR INTERVALS
PRECIPITATOR ELECTRICAL DATA

Time : 1600
Date : 10/7/95
Initials : ~~[illegible]~~ LCS

1 B (A/B)

Rectifier Set	AC Volts	AC Amps	DC Kv	DC Amps	Sparks	Comments
11	204	14	39.1	51		
12	205	14	40.1	59		
13	202	14	40.0	59		
14	202	14	34.7	63		
15	192	14	38.9	55		
16	200	14	38.1	59		
21	218	12	43.0	51		
22	211	12	42.1	47		
23	215	12	42.4	51		
24	224	12	44.7	47		
25	209	12	41.6	51		
26	207	12	40.3	51		
31	214	12	43.6	47		
32	203	12	41.4	51		
33	209	12	41.8	51		
34	218	12	44.1	45		
35	211	12	42.8	47		
36	222	12	40.9	79		
41	222	20	44.2	75		
42	222	20	46.2	79		
43	222	20	44.7	77		
44	207	20	43.5	75		
45	219	20	44.1	75		
46	226	20	46.1	79		
51	230	25	44.1	106		
52	224	25	41.9	106		
53	230	25	44.5	102		
54	219	20	44.8	77		
55	244	25	46.7	102		
56	236	25	46.6	106		
61	224	30	41.2	130		
62	224	30	39.7	134		
63	227	30	42.5	130		
64	248	30	44.5	135		
65	244	30	44.4	130		
66	232	30	46.1	122		
71	40	235	41.4	185		
72	40	246	41.9	185		
73	40	232	43.7	181		
74	186	19	19.8	110	31	J51
75	315	40	46.1	184		
76	324	20	41.7	185		

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # TWO

DATE: 11·4·93

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		DS	DS	DS	DS	DS	
Time		2200	2230	2300	2330	2400	
Steam Flow	LB/HR x 10^6	2.18	2.10	2.17	2.10	2.03	
Air Flow	%	51	51	51	51	50	
Generator Load (Gross)	Megawatts	305	301	303	299	297	
Boiler Thermal Demand	Megawatts	298	297	302	298	297	
O_2 Flue Gas	%	5.4	5.6	5.0	5.3	5.3	
Fuel Flow	%	48	48	51	51	51	
Coal Totalizer	Tons						
A		62	60	59	59	58	
B		0	0	0	0	0	
C		57	56	56	56	55	
D		61	61	61	62	62	
E		0	0	0	0	0	
F		0	0	0	0	0	
G		60	58	57	57	58	

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # TWO

DATE: 11·5·95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		DS	DS	DS	DS	DS	DS
Time		0030	0100	0130	0200	0230	0300
Steam Flow	LB/HR x 10^6	2.03	2.10	2.16	2.07	2.16	2.11
Air Flow	%	51	50	50	50	50	50
Generator Load (Gross)	Megawatts	295	300	308	302	307	303
Boiler Thermal Demand	Megawatts	290	298	304	298	299	291
O_2 Flue Gas	%	5.4	5.3	5.3	5.1	5.3	5.1
Fuel Flow	%	51	51	51	51	51	51
Coal Totalizer	Tons						
A		58	58	58	58	59	58
B		0	0	0	0	0	0
C		56	56	56	56	56	56
D		61	61	61	62	61	61
E		0	0	0	0	0	0
F		0	0	0	0	0	0
G		58	58	58	58	58	58

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # TWO

DATE: 11 · 5 · 95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		DS	DS	DS	DS	EAP	EAP
Time		0330	0400	0430	0500	0530	0600
Steam Flow	LB/HR x 10^6	2.13	2.13	2.07	2.05	2.17	2.06
Air Flow	%	50	50	50	50	50	50
Generator Load (Gross)	Megawatts	304	309	298	294	307	293
Boiler Thermal Demand	Megawatts	289	296	293	290	291	285
O_2 Flue Gas	%	5.2	5.0	5.2	5.2	5.2	5.2
Fuel Flow	%	51	51	51	51	51	51
Coal Totalizer	Tons						
A		58	58	58	58	58	58
B		0	0	0	0	0	0
C		56	56	56	55	55	55
D		62	62	62	61	61	62
E		0	0	0	0	0	0
F		0	0	0	0	0	0
G		58	58	58	58	58	58

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # 2

DATE: 11-5-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		EAP	EAP		EAP	EAP	EAP
Time		0630	0700		0800	0630	0900
Steam Flow	LB/HR x 10^6	2,33	2.48	RASING	3.08	3.06	3.12
Air Flow	%	51	56		67	64	66
Generator Load (Gross)	Megawatts	325	352	UNIT	474	477	475
Boiler Thermal Demand	Megawatts	314	341	LOAD	435	433	435
O_2 Flue Gas	%	5.5	4.9		3.5	3.8	3.2
Fuel Flow	%	53	60		72	72	73
Coal Totalizer	Tons						
A		58	60		72	72	72
B		0	0	0	0	0	0
C		56	58		65	65	66
D		62	65		68	68	69
E		0	0	0	0	0	0
F		0	24		68	68	69
G		57	21		66	66	67

Ignitors In Service on 2-F burner Deck. Preparing pulverizer for service in anticipation of load increase.

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # 2

DATE: 11/5/95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		EAP	EAP	EAP	EAP	EAP	EAP
Time		0930	1000	1030	1100	1130	1200
Steam Flow	LB/HR x 10^6	3.10	3.10	3.08	3.09	3.09	3.10
Air Flow	%	65	65	65	64	65	66
Generator Load (Gross)	Megawatts	475	475	474	478	475	474
Boiler Thermal Demand	Megawatts	436	434	433	433	432	431
O_2 Flue Gas	%	3.3	3.4	3.4	3.2	3.6	3.5
Fuel Flow	%	73	74	72	68	68	68
Coal Totalizer	Tons						
A		72	72	71	73	72	70
B		0	0	0	0	0	0
C		66	66	65	66	67	65
D		69	69	68	70	69	68
E		0	0	0	0	0	0
F		69	69	67	69	69	68
G		67	68	45	67	67	66

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # 2

DATE: 11/5/95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		EAP	EAP	EAP	EAP		
Time		1230	1300	1330	1400		
Steam Flow	LB/HR x 10^6	3.07					
Air Flow	%	65					
Generator Load (Gross)	Megawatts	476					
Boiler Thermal Demand	Megawatts	433					
O_2 Flue Gas	%	3.5					
Fuel Flow	%	68					
Coal Totalizer	Tons						
A		72					
B		0					
C		66					
D		69					
E		0					
F		69					
G		67					

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # 2

DATE: 11-6-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		EA	EA	EA	EA	EA	EA
Time		0800	0830	0855	0930	1000	1030
Steam Flow	LB/HR x 10^6	4.54	4.54	4.54	4.53	4.57	4.52
Air Flow	%	87.9	86.7	87.1	88	88	87.6
Generator Load (Gross)	Megawatts	655	655	652	655	654	655
Boiler Thermal Demand	Megawatts	640	639	638	635	637	640
O_2 Flue Gas	%	3.2	3.1	3.2	2.9	3.1	2.9
Fuel Flow	%	94.3	95.5	94.3	93.7	92.6	93.6
Coal Totalizer	Tons						
A		81	84	80	83	82	82
B		0	0	0	0	0	0
C		76	76	77	78	76	75
D		78	78	78	79	77	79
E		79	79	79	79	80	80
F		79	77	77	79	79	79
G		77	77	77	76	75	75

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # 2

DATE: 11-6-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		E.A	E.A	E.A.	E.A.	E.A.	E.A.
Time		1100	1130	1200	1230	1300	1330
Steam Flow	LB/HR x 10^6	4.55	4.53	4.54	4.56	4.58	4.58
Air Flow	%	88.4	88.3	89.1	88.6	90.4	89.3
Generator Load (Gross)	Megawatts	653	654	654	654	653	656
Boiler Thermal Demand	Megawatts	643	640	637	642	645	643
O_2 Flue Gas	%	3.0	3.2	3.3	3.1	3.0	3.0
Fuel Flow	%	93.6	93.6	92.2	92.2	92.2	92.2
Coal Totalizer	Tons						
A		83	80	79	82	81	78
B		0	0	0	0	0	0
C		78	75	77	77	76	77
D		79	77	78	78	78	77
E		81	79	77	79	79	79
F		79	78	78	79	78	76
G		73	71	70	68	71	67

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # 2

DATE: 11-6-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		EA	EA	EA	EA	EA	
Time		1400	1430	1500	1530	1600	
Steam Flow	LB/HR x 10^6	4.58	4.56	4.58	4.58	4.58	
Air Flow	%	88.6	88.0	85.7	88.1	88	
Generator Load (Gross)	Megawatts	655	653	657	657	657	
Boiler Thermal Demand	Megawatts	647	639	646	646	649	
O_2 Flue Gas	%	3.0	3.1	3.3	3.1	3.1	
Fuel Flow	%	91.1	91.1	91.1	91.1	91.1	
Coal Totalizer	Tons						
A		80	79	80	80	81	
B		0	0	0	0	0	
C		76	74	78	74	75	
D		77	76	79	77	78	
E		79	78	79	79	78	
F		79	76	78	76	78	
G		70	69	71	69	71	

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # TWO

DATE: 11-7-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data							
Time		0800	0830	0900	0930	1000	1030
Steam Flow	LB/HR x 10^6	4.60	4.62	4.63	4.61	4.63	4.63
Air Flow	%	91.0	90.1	91.0	90.6	90.9	91.4
Generator Load (Gross)	Megawatts	656	658	661	660	662	664
Boiler Thermal Demand	Megawatts	646	649	650	649	652	649
O_2 Flue Gas	%	3.2	3.0	2.9	3.2	3.2	2.8
Fuel Flow	%	95	94	97	94	96	95
Coal Totalizer	Tons						
A		84	82	82	82	81	82
B		—	—	—	—	—	—
C		79	78	83	78	80	78
D		81	79	84	80	82	80
E		73	73	73	73	73	73
F		81	79	84	80	82	80
G		79	78	82	77	79	79

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UNIT # TWO

DATE: 11-7-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Time		1100	1130	1200	1230	1300	1330
Steam Flow	LB/HR x 10^6	4.64	4.65	4.62	4.63	4.67	4.64
Air Flow	%	88.9	90.8	92.2	92.8	93.0	93.1
Generator Load (Gross)	Megawatts	660	658	658	660	657	659
Boiler Thermal Demand	Megawatts	651	651	649	650	650	652
O_2 Flue Gas	%	3.4	3.5	2.9	2.9	3.1	3.1
Fuel Flow	%	97	97	97	97	98	96.8
Coal Totalizer	Tons						
A		81	81	81	81	81	81
B		—	—	—	—	—	—
C		83	82	81	83	82	83
D		84	84	84	84	83	84
E		73	73	73	73	73	73
F		84	83	82	85	84	84
G		81	81	80	82	81	81

ST. JOHNS RIVER POWER PARK
BOILER CONTROL ROOM DATA
UN NO

DATE: 11-7-95

PARAMETER	UNITS	READINGS (30 minute intervals)					
Person Recording Data			–				
Time		1400	1430	1500	1530	1600	1630
Steam Flow	LB/HR x 10^6	4.64	4.64	4.64	4.64	4.65	4.64
Air Flow	%	92.4	91.8	91.6	91.9	92.3	92.4
Generator Load (Gross)	Megawatts	660	658	657	656	657	660
Boiler Thermal Demand	Megawatts	650	651	651	652	651	651
O_2 Flue Gas	%	3.1	3.0	3.9	3.1	2.8	3.1
Fuel Flow	%	97	97	97	96	96	96
Coal Totalizer	Tons						
A		82	82	82	82	82	83
B		–	–	–	–	–	–
C		81	82	80	80	81	82
D		83	83	82	82	82	83
E		73	73	73	73	73	75
F		83	84	83	82	83	83
G		80	81	79	79	80	75

st. johns river POWER PARK

FLUE GAS DESULFURIZATION OPERATIONAL PARAMETERS

FGD Unit # 2 **DATE:** 11/6/95

Hour	PACKING DIFFERENTIAL PRESSURE (inches H20 column)		
	A	B	C
0000			
0100			
0200			
0300			
0400			
0500			
0600			
0700			
0800	O/S	1.55	2.30
0900	O/S	1.60	2.40
1000	O/S	1.60	2.45
1100	O/S	1.70	2.50
1200	O/S	1.60	2.20
1300	O/S	1.70	2.55
1400	O/S	1.75	2.55
1500	O/S	1.75	2.55
1600	O/S	1.75	2.45
1700	O/S		
1800			
1900			
2000			
2100			
2200			
2300			

Daily System Water Use: ________ (Total Gallons) / 1440 (min/day) = _____ GPM

COMMENTS: ______________________________

Pollution Monitor Daily Report V4.1 11/07/1995 Page # 1

Company: St. Johns Unit 2 Location:

Source : Unit 2 Channel : 2Opacity Units: %

00:00	2.5	7.8IC	9.8IC	2.4	2.4	2.1	2.1	2.1	2.0	2.3	Avg:	2.
01:00	2.3	2.0	2.1	2.3	2.2	2.3	2.3	2.3	2.0	2.2	Avg:	2.
02:00	2.2	2.0	2.2	2.7	2.1	2.3	2.0	2.1	2.1	2.0	Avg:	2.
03:00	2.2	1.8	2.1	2.5	2.0	2.0	1.8	2.0	2.1	1.9	Avg:	2.
04:00	2.0	2.0	2.0	2.0	2.1	2.0	1.8	1.9	2.2	2.0	Avg:	2.
05:00	2.1	1.9	2.3	2.2	2.2	2.4	2.6	2.4	2.6	2.9	Avg:	2.
06:00	2.8	2.5	3.1	2.8	3.0	2.6	2.4	2.4	2.9	2.6	Avg:	2.
07:00	2.8	2.6	3.1	2.9	2.6	2.5	2.6	2.6	2.8	2.6	Avg:	2.
08:00	2.7	2.7	3.0	2.8	2.5	2.5	2.5	2.6	2.6	2.5	Avg:	2.
09:00	2.6	2.8	2.6	2.7	2.5	2.6	3.0	2.5	2.8	2.7	Avg:	2.
10:00	2.5	2.8	2.9	2.8	2.8	2.6	3.0	2.5	2.7	2.7	Avg:	2.
11:00	2.7	3.1	2.8	2.8	2.9	2.8	3.1	3.0	2.7	3.0	Avg:	2.
12:00	2.6	3.2	3.2	2.8	3.2	2.8	3.0	3.2	2.9	3.4	Avg:	3.
13:00	3.0	3.4	3.6	3.0	3.3	3.0	2.8	3.1	2.7	2.7	Avg:	3.
14:00	3.0	2.9	2.8	3.0	3.1	3.0	2.7	3.0	2.9	2.8	Avg:	2.
15:00	3.1	2.9	3.1	3.0	2.9	3.2	2.9	3.1	3.1	2.7ND	Avg:	3.
16:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
17:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
18:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
19:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
20:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
21:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
22:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		
23:00	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND	**ND		

Daily Average: 2.6 Count: 157 Max: 3.6

LABORATORY REPORTS

Analytical Data Sheet

Client JEA/SJRPP Project No. 95-420 FL Date 11-6-95

Run No. 1 Unit 1 Stack
Filter No. 95-045 NC
Acetone No.
Amount liquid lost during transport
Acetone blank volume, ml
Acetone wash volume, ml
Acetone blank concentration, mg/mg (equation 5-4)**
Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6064	.5938	.0126
2	60.5057	60.4893	.0164
Total			.0290
	Less acetone blank		-.0001
	Weight of particulate matter		.0289

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	346.0	278.8
Initial	200.0	250.0
Liquid collected	146.0	28.8
Total Volume Collected	174.8	g* ml

Run No. 2 Unit 1 Stack
Filter No. 95-042
Acetone No.
Amount liquid lost during transport
Acetone blank volume, ml
Acetone wash volume, ml
Acetone blank concentration, mg/mg (equation 5-4)**
Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6114	.6017	.0097
2	70.1765	70.1608	.0157
Total			.0254
	Less acetone blank		-.0001
	Weight of particulate matter		.0253

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	350.0	287.0
Initial	200.0	250.0
Liquid collected	150.0	37.0
Total Volume Collected	187.0	g* m

Run No. 3 Unit 1 Stack
Filter No. 95-041 NC
Acetone No.
Amount liquid lost during transport
Acetone blank volume, ml
Acetone wash volume, ml
Acetone blank concentration, mg/mg (equation 5-4)**
Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6056	.5954	.0102
2	70.8898	70.8727	.0171
Total			.0273
	Less acetone blank		-.0001
	Weight of particulate matter		.0272

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	342.0	288.4
Initial	200.0	250.0
Liquid collected	142.0	38.4
Total Volume Collected	180.4	g* ml

Run No. Blank
Filter No.
Acetone No.
Amount liquid lost during transport
Acetone blank volume, ml 150.0
Acetone wash volume, ml
Acetone blank concentration, mg/mg (equation 5-4)**
Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	60.7137	60.7136	.0001
2	—	—	
Total			
	Less acetone blank		
	Weight of particulate matter		

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final		
Initial		
Liquid collected		
Total Volume Collected		g* m

Client JEA/SJRPP Project No. 95-420 FL Date

Best Available Copy

Run No. 1 Unit 2 Stack

Filter No. 95-059 NC

Acetone No.

Amount liquid lost during transport

Acetone blank volume, ml

Acetone wash volume, ml

Acetone blank concentration, mg/mg (equation 5-4)**

Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6070	.6023	.0047
2	60.4969	60.4830	.0139
Total			.0186
	Less acetone blank		-.0001
	Weight of particulate matter		.0185

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	334.0	282.6
Initial	200.0	250.0
Liquid collected	134.0	32.6
Total Volume Collected	166.6	g* ml

Run No. 2 Unit 2 Stack

Filter No. 95-046 NC

Acetone No.

Amount liquid lost during transport

Acetone blank volume, ml

Acetone wash volume, ml

Acetone blank concentration, mg/mg (equation 5-4)**

Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6032	.5980	.0052
2	70.1770	70.1627	.0143
Total			.0195
	Less acetone blank		-.0001
	Weight of particulate matter		.0194

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	360.0	276.3
Initial	200.0	250.0
Liquid collected	160.0	26.3
Total Volume Collected	186.3	g*

Run No. 3 Unit 2 Stack

Filter No. 95-047NC

Acetone No.

Amount liquid lost during transport

Acetone blank volume, ml

Acetone wash volume, ml

Acetone blank concentration, mg/mg (equation 5-4)**

Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1	.6137	.6087	.0050
2	70.8891	70.8767	.0124
Total			.0174
	Less acetone blank		-.0001
	Weight of particulate matter		.0173

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final	376.0	271.1
Initial	200.0	250.0
Liquid collected	176.0	21.1
Total Volume Collected	197.1	g* ml

Run No.

Filter No.

Acetone No.

Amount liquid lost during transport

Acetone blank volume, ml

Acetone wash volume, ml

Acetone blank concentration, mg/mg (equation 5-4)**

Acetone wash blank, mg (equation 5-5)**

Container Number	Weight of Particulate Collected g		
	Final Weight	Tare Weight	Weight Gain
1			
2			
Total			
	Less acetone blank		
	Weight of particulate matter		

	Volume of Liquid Water Collected	
	Impinger Volume, ml.	Silica Gel Weight, g
Final		
Initial		
Liquid collected		
Total Volume Collected		g*

*Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{\text{1g/ml}}$ = Volume Water, ml

**See Federal Register, Method 5, 6.6, & 6.7.

UNIT: 1

SAMPLE TYPE: EXXON RECLAIM

BURN DATE: 10-31-95

	AS RECEIVED	DRY	MAF
% MOISTURE:	13.06%		
% ASH:	8.21%	9.44%	
B.T.U.:	11436	13153	14524
% SULFUR:	0.71%	0.81%	

UNIT: 2

SAMPLE TYPE: DOMESTIC RECLAIM

BURN DATE: 11-02-95

	AS RECEIVED	DRY	MAF
% MOISTURE:	6.79%		
% ASH:	10.99%	11.79%	
B.T.U.:	12159	13045	14789
% SULFUR:	0.98%	1.05%	

UNIT: 2

SAMPLE TYPE: DOMESTIC RECLAIM

BURN DATE: 11-07-95

	AS RECEIVED	DRY	MAF
% MOISTURE:	5.53%		
% ASH:	9.07%	9.60%	
B.T.U.:	12767	13514	14949
% SULFUR:	1.40%	1.48%	

UNIT: 1

SAMPLE TYPE: EXXON, LEGEND (SHIP)

BURN DATE: 11-06-95

	AS RECEIVED	DRY	MAF
% MOISTURE:	9.92%		
% ASH:	8.59%	9.54%	
B.T.U.:	11803	13102	14484
% SULFUR:	0.75%	0.83%	

DEPARTMENT OF HEALTH, WELFARE
& BIO-ENVIRONMENTAL SERVICES
Bio-Environmental Services Division
Air and Water Pollution Control

June 25, 1984

CITY OF JACKSONVILLE, FLORIDA ®

DER
JUN 27 1984
DAQM

Mr. Clair Fancy, P.E.
Dept. of Environmental Regulation
Twin Towers Office Building
2600 Blairstone Road
Tallahassee, Florida 32301

Re: BACT, JEA Northside Generating Station
Proposed Boiler

Dear Mr. Fancy:

Bio-Environmental Services Division(BESD) concurs with the JEA letter dated June 11, 1984 concerning the record keeping requirements for the captioned source. The proposed actions appear to be adequate to prevent a PSD impact and yet give JEA the necessary operating flexibility. This Agency recommends approval of JEA's request.

If you have any questions concerning this matter, please advise.

Very truly yours,

Jerry E. Woosley

Jerry E. Woosley
Assistant Engineer

JEW/vj
Enclosure

cc: Mr. Richard Breitmoser - JEA
cc: Mr. Doug Dutton - DER

Jacksonville Electric Authority

233 WEST DUVAL STREET • P. O. BOX 53015 • JACKSONVILLE, FLORIDA 32201

JEA "POWER TO SERVE"

June 11, 1984

DER

JUN 14 1984

BAQM

Mr. J. E. Woosley, Assistant Engineer
Bio-Environmental Services Division
515 West Sixth Street
Jacksonville, Florida 32206

Dear Mr. Woosley:

Subject: Northside Generating Station - Proposed Auxiliary Boiler

We met in your offices on June 7 to discuss load limitations for the existing and proposed auxiliary boilers at JEA's Northside Generating Station. It will be necessary in order to preclude any possible violation of PSD limitations, to limit the total station firing rate when auxiliary boilers are in service. The main generating units are already limited by the maximum heat inputs in their operating permits.

MAXIMUM STATION LOAD

The theoretical operating configuration discussed which could result in the maximum input would be:

The two largest generating units (#1 & #3) on line at maximum capability; plus
The third generating unit (#2) just being brought on line and at minimum stable load; plus
The proposed auxiliary boiler on line for start-up steam for Unit No. 2.

This configuration would not continue because the auxiliary would be shut down as soon as stable operation is established. It could, however, exist for some period of time.

The total station heat input in the noted situation could be:

#1 Unit	2767 MBtu/hr		
#2 Unit	1000 MBtu/hr	40%	2352 MBtu/hr
#3 Unit	5033 MBtu/hr		
Auxiliary boiler	120 MBtu/hr		
	8920 MBtu/hr		

At 18,500 Btu/lb of oil, this is equivalent to 482 K lb of oil per hour. It is proposed that this be the maximum allowable station fuel firing rate for No. 6 oil when an auxiliary boiler is in service.

(CONT.)

LOAD VERIFICATION

To assure that the proposed maximum firing rate is not exceeded, JEA will, when an auxiliary boiler is in service, maintain a four hourly log of total fuel consumption. The log will be monitored and the maximum four hour fuel consumption will be 1,500,000 pounds (approximately 80% of the four hour allowable).

Since the ambient SO_2 impact appears to be the limiting factor and since the short time SO_2 limit is a three hour limit, JEA will log three hour total fuel consumptions if the four hour total should exceed 1,500,000 pounds. The three hour fuel consumption limit will be 1,440,000 pounds (3 X 482 K), never to be exceeded when an auxiliary boiler is in service.

PERMIT CONDITION FOR MAXIMUM OPERATION

It is proposed that the following specific condition be included in the permits for both auxiliary boilers at Northside Station:

> "Total station #6 oil consumption shall be logged for each four hour period whenever the auxiliary boiler is in service. Whenever the four hour consumption exceeds 1,500,000 pounds, totals shall be logged for each three hour period. The total #6 fuel oil consumption shall not exceed 1,440,000 pounds in any three hour period. The oil consumption log shall be retained and available for inspection for two years".

It is the intent that oil consumption data be taken from the existing station control meters. Because these are not of accounting accuracy, JEA will provide correction factors from inventoried consumption data whenever the three hour consumption exceeds 90% of allowable.

Please let me know if you find this proposal acceptable. I will be happy to discuss it further with you if necessary.

Very truly yours,

Paul L. Suter
Research & Environmental
Affairs Division

PLS/lwr

cc: G. D. Dutton - DER Jax.
C. H. Fancy - DER Tallahassee
K. Mehta - BES
H. W. Chapman
W. R. Steinmeyer
R. Breitmoser
D. W. Stanley
E. R. Joyce
Files

Enclosure: Fuel Log

Jacksonville Electric Authority

233 WEST DUVAL STREET • P. O. BOX 53015 • JACKSONVILLE, FLORIDA 32201

JEA POWER TO SERVE

Res. & Env. Affairs Division

Project Northside Auxiliary Boilers - Permit Requirements

Subject FUEL SHEET DRAFT

Sheet No. 1 Of 1

File No.

Date June 11, 1984

Engineer P. L. Suter

NORTHSIDE STATION - TOTAL FUEL CONSUMPTION - K POUNDS

Date	Hours	#1	#2	#3	A	B	TOTAL

Log four hour totals when Aux. Boiler is in service. Log three hours when 4 hr > 1900 K lb. 3 hr shall not exceed 1440 K lb.

DEPARTMENT OF HEALTH, WELFARE
& BIO-ENVIRONMENTAL SERVICES
Bio-Environmental Services Division

May 11, 1984

Steve Smallwood pr

RECEIVED
CITY OF JACKSONVILLE, FLORIDA
MAY 14 1984
Office of the Secretary

Mr. Richard Breitmoser, P.E.
Division Chief
Research & Environmental Affairs
Jacksonville Electric Authority
P.O. Box 53015
Jacksonville, Florida 32201

Re: Auxiliary Boiler "B"

Dear Mr. Breitmoser:

This Agency has received a copy of your petition for relief from Specific Condition No. 9 of Permit A016-78586. The information presented in the permit application and additional information received does not reflect the possible operating conditions outlined in your petition for relief. Specifically these differences are:

> The comments on page 3 of 8 of the application received on February 10, 1984 indicate that the Auxiliary Boiler "B" is for "...essential services when the station generating units are shutdown". Later on the same page you state "It does not operate, however, except when the major station units are shut down or at low levels of operation", and "It was to be operated only when No. 1 was down...". Paragraph 2 of your petition states "It is possible that No. 1 generating unit could be on line, at essentially full capability, and that steam would be needed at auxiliary pressure for start-up of another unit". In paragraph 3 of your petition you state "... when units are at minimum loads the auxiliary boiler may be operated solely for soot blowing purposes".

Prior to further review of your request for a change in Specific Condition No. 9, the various operating capabilities of the auxiliary boiler in relation to the other generating units needs to be clarified. In addition, please provide the maximum heat input at which main units will operate simultaneously with the auxiliary boiler.

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP	ACTION NO
	ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION)	Initial
~~Steve Smallwood~~	Date
2.	Initial
Clair Fancy	Date
3.	Initial
5-21 Bill T.	Date
4.	Initial
	Date

REMARKS:

Please handle

DER
MAY 15 1984
BAQM

INFORMATION	
	Review & Return
	Review & File
	Initial & Forward

DISPOSITION	
	Review & Respond
	Prepare Response
	For My Signature
	For Your Signature
	Let's Discuss
	Set Up Meeting
	Investigate & Report
	Initial & Forward
	Distribute
	Concurrence
	For Processing
	Initial & Return

FROM:

Pam McVety

DATE 5-14-84

PHONE

Your response is requested as soon as possible. If you have further questions, please advise.

Very truly yours,

Jerry E. Woosley
Assistant Engineer

JEW/vj

cc: Mr. Doug Dutton - DER
~~cc~~: Ms. Victoria Tschinkel

State of Florida

DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices
And/Or To Other Than The Addressee

To: Bill Thomas		Loctn.: Air Qual	
To:		Loctn.:	
To:		Loctn.:	
From:		Date:	

TO: Power Plant Siting Review Committee

FROM: Karen W. Anthony, Power Plant Site Certification Section KWA

DATE: May 20, 1980

SUBJECT: JEA's Revised Plan of Study for Their "Eastport" Site

We recently sent out portions of JEA's POS for your review by May 28th. Since we received the revised POS, JEA has sent us a marked-up copy of their original November version of the plan, with a twenty-or-so page lead section wherein they address questions raised by the earlier version. I found some of their answers quite informative, giving a better idea of their intentions than just reading the revised plan. For that reason, I am sending you those responses as well, since the answers may raise more issues. If you have any problems with these as well as the revised POS, please let us know as soon as possible.

KWA:jb

Attachment

MAY 1980
RECEIVED
BUREAU
AQM

H6 - Rev 7/76

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
(James E. McNeal)

November, 1979

Comment 1: I do not have any problems with the Plan of Study regarding the geology-groundwater sections as presented November 6 at a meeting with interested persons. I do suggest the plans (notably Sections 4.3.4, 4.3.5, and 4.3.6) include a description and evaluation of the coal storage areas. Any leachate from these areas will have to be considered for their impacts on the ground waters. An analysis of the coal will be necessary for this evaluation.

Response 1: We agree with Mr. McNeal that the impact of possible leachate from coal storage as well as all other storage areas should be assessed as was our original intent. We have changed the wording of the appropriate POS sections to reflect this concern. If the procurement of the plant coal is not accomplished by the date of SCA/EID filing, the plant performance coal will be used.

Changes to POS: Task 4.3.4, page 4-36; Task 4.3.5, page 4-37; Task 4.3.6, page 4-37.

Comment 2: George Bain, Principal Hydrologist with Ebasco Services Inc., (consultants to JEA), and I met today to establish communication and exchange some technical references and contacts. I mentioned the potentiometric surface of the Floridan Aquifer has a depression closure along the St. Johns River at Jacksonville, near one of the sites. He is pursuing technical studies and is in contact with the USGS in Jacksonville to secure their latest potentiometric maps. I relayed the Groundwater Section's desire to remain informed on the progress of their hydrological studies in the area.

Response 2: There are two groundwater drawdown cones shown on the latest (Watkins, et.al., 1978) Floridan potentiometric map. The nearest, along the St. Johns River, extends from Jacksonville to Orange Park as a broad depression in the +30 ft. conform reflecting the +200 mgd of groundwater being withdrawn in the area. The other, centered at Fernandina Beach to the northeast of the site, is quite steep and extensive having a -100 contour at the Beach. Withdrawal of 500 gpm (average) from the Floridan for the various plant water requirements will not be significant.

Changes to POS: None

FLORIDA GAME AND FRESH WATER FISH COMMISSION

NOVEMBER, 1979

Comment 1: Generally, the Plan of Study appears to be quite comprehensive with regard to biological concerns. An additional subsection could be added under The Site - Aquatic Ecology: 2.8.7 Aquatic Mammals, because of the use of the river by the endangered manatee and its specific attraction to thermal discharges.

Response 1: Sections 2.8.7 Aquatic Mammals has been added to the SCA/EID outline. Task 4.6.2h in the POS deals with the manatee related field activities.

Changes to POS: Section 3.0, page 3-3; Task 4.6.2f, page 4-66

Comment 2: We can provide information concerning the biological resources of the study areas. We offer whatever assistance is requested and available so that the most complete and accurate assessment of the potential impacts/benefits of power plant construction and operation may be developed. Of greatest concern is the protection of wetlands and other sensitive habitat.

Response 2: We thank you for the support and offer for assistance.

Any areas on the proposed site that can be defined as wetlands using the generic definition employed by the Army Corps of Engineers, Florida Department of Environmental Regulation, and other appropriate agencies, will be identified. Once the areas are identified, a jurisdictional review will be requested from the Corps of Engineers and other regulatory agencies. The boundaries of the wetland areas will be defined and then reviewed with the agency with jurisdictional authority. These areas will be sampled and described in the same manner as the other vegetation communities.

Changes to POS: None

JACKSONVILLE DEPARTMENT OF HEALTH, WELFARE AND BIO-ENVIRONMENTAL SERVICES
BIO-ENVIRONMENTAL SERVICES DIVISION

November, 1979

Comment 1: Because of growing concerns about acid rain in North Florida, DER should consider requiring background monitoring of this pollutant. Ambient Pb levels should also be determined since some amount of Pb is emitted from coal combustion.

Response 1: We feel that sufficient background precipitation pH data will be available from the University of Florida network (four stations in the general area) to preclude the need for us to monitor for that parameter. Concerning Pb, we expect that only minor amounts will be emitted from the plant, but since no ambient Pb data are available, we have agreed to include this in our program with BESD doing the analyses of the Hi-Vol filters.

Changes to POS: Task 4.1.2, page 4-4

Comment 2: No mention is made of the method of monitoring of the temperature in the monitoring building. Temperature monitoring should be accomplished with a 7-day thermograph rather than a min-max thermometer to insure that the operation specifications of 40 CFR Part 53 are maintained.

Response 2: Although not currently mentioned in the POS, average shelter temperature is recorded hourly by the data logger. In addition, a max-min thermometer is used to record extremes.

Changes to POS: Task 4.1.2, page 4-4

Comment 3: The overall air monitoring quality assurance program should include a quality control check on the total monitoring system integrity. Our experience with daily zero and spans of continuous analyzers is that leaks can occur in the 3-way teflon solenoid valves. A vacuum check and establishment of control limits (i.e. inches of loss in gauge pressure/minute) would determine when corrective action is needed. The total system check should also include at least a quarterly check of the total intake manifold. Debris, condensation and other foreign matter in the intake manifold may scrub some pollutants while an analyzer's operation may appear to be normal, since zero and span checks are usually performed at the analyzer's intake bulkhead union.

Response 3: This is being included in our detailed station operating and quality assurance procedures documents.

Changes to POS: None

Comment 4: We were under the impression that closed cycle cooling would definitely be the design approach used.

Response 4: Closed cycle cooling will be used with makeup water withdrawn from the Northside Plant discharge and blowdown re-injected into the discharge at a point downstream. A cross-over may be provided to allow makeup to be withdrawn from the Northside Plant intake canal to avoid recirculation in the event that all Northside circulating water pumps are taken out of operation.

Changes to POS: None

Comment 5: Same as for 4.1.7 (Comment 4): this section should not be needed.

Response 5: See Response 4.

Changes to POS: Task 4.2.6, pages 4-19, 20

Comment 6: Add St. Johns County EPB for other environmental background sources.

Response 6: This will be added.

Changes to POS: Task 4.2.7, page 4-21

Comment 7: Add Clay County Building & Zoning Department. They have some limited county well location information.

Response 7: The above information will no longer be needed as a result of the selection of the Eastport site.

Changes to POS: None

Comment 8: Changes in water quality over time with pumping should also be studied during pump tests. Depending on final site selection, consideration should be given to drilling to the bottom of the Floridan Aquifer to determine the location and movement of the freshwater-saltwater interface.

Response 8: Observation of the change of water quality with time during pumping tests is a normal procedure for such tests. This approach is implicit in Task 4.3.2 of the POS.

We also concur that establishing the physical and hydrologic character, geometry and chemical quality of water of both the Floridan Aquifer and its overlying aquiclude (principally Hawthorn Fm.) is the only responsible approach.

With respect to the Eastport site, however, the data density on the northeast side of Jacksonville is excellent. The altitude of the top and bottom of the Floridan, the thickness of the overlying aquiclude, the position of the salt water interface, the potentiometric head hydraulic characteristics, water-table surface, and water chemistry are all, very well mapped, tested, and/or monitored by the USGS. Driller's, geologic, paleontological, and geophysical logs for Floridan wells have been assembled for the site and vicinity. Requesting JEA to construct such a well to the base of the Floridan, solely for information and monitoring purposes, creates an unjustified and unwarranted financial burden on this utility, and this is not included in our field program.

Changes to POS: None

Comment 9: Other techniques might be more appropriate in this task for identification of main faults in the Floridan Aquifer, i.e. surface resistivity studies. This analysis is important because of the proposed site's close proximity to faults suspected by the USGS.

Response 9: The faults in question (Leve, 1978) as reported by Leve ". . . are blanketed by 250 to 600 feet of post-Eocene sediments and do not extend to the surface." We find no evidence in the site borings of displacement in the Hawthorne-post-Hawthorne contract. Because there is no evidence of movement since Eocene, the faults pose no hazard to construction or operation of the plant.

Changes to POS: None

Comment 10: For the selected site: plant design and construction need to address the treatment and disposal of water from stormwater runoff, i.e. coal stockpiles and industrial area. Boiler blowdown will also require treatment.

Response 10: These will be addressed in Sections 3.5 and 4.1 of the SCA/EID.

Changes to POS: None

Comment 11: All treatment facilities should be designed to meet maximum hydraulic loads. In the case of stormwater runoff, the facility should be designed to treat a 25-year, 24-hour storm event. All treatment plants and percolation ponds should have adequate additional land available for expansion or if alternate treatment should be necessary. This is particularly so regarding any waste chemical ponds.

Response 11: Stormwater runoff facilities will normally be designed for 10-year, 24-hour storm event and checked for 50-year, 24-hour storm event unless specific regulations require a design for 25-year, 24-hour storm event. Expansion, if necessary, of treatment facilities is a standard practice, and appropriate provisions for expansion will be made.

Changes to POS: None

Comment 12: PCB background data should be established in surface, sediment, groundwater and terrestrial samples prior to construction. A complete background study of groundwater water quality parameters should be done so that the degradation and mixing zone concepts of 17-3 can be enforced.

Response 12: Tasks 4.2.8, 4.3.3, and 4.3.7 address the intent and level of the groundwater monitoring program. Table 4.3-1 (Recommended Groundwater Physical and Chemical Parameters to be Tested) in the POS provides a list of the parameters to be analyzed during the groundwater monitoring program.

With regard to the determination of polychlorinated biphenyls (PCB's), a program has been designed and is discussed in Tash 4.2.8 of the POS. The PCB monitoring program includes collection and analysis of ten water samples and eight sediment samples during two seasons of the year. We are aware of the abandoned chemical waste pond and the municipal landfill areas on and adjacent to the Eastport site, and sample points have been located accordingly. At this time a program for analyzing terrestrial samples is not felt to be necessary since sediment samples near the potential PCB contaminant areas are being analyzed.

Changes to POS: Task 4.2.8, page 4-28; Task 4.3.7, page 4-38; Table 4.3.1, pages 4-39, 40

Comment 13: All surface and groundwater should conform with Water Quality Standards as defined in Chapter 17-3 F.A.C. after reasonable mixing.

Response 13: The proposed action is being taken with the intent of conforming with Water Quality Standards as defined in Chapter 17-3 F.A.C. This intent does not exclude reliance on Section 17-3.031 (Exceptions From Criteria), F.A.C. when conditions so dictate.

Changes to POS: Task 4.2.5, page 4-19

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

December, 1979

Comment: The District staff has completed its review of the Site Certification Application Plan of Study. Our general consensus is that the study objectives are adequate and that the approaches described are sound. The District would also like to request that we continue our close contact with you during the data collection and report preparation phase of the project.

Response: We will make every effort to maintain contact throughout the life of the project with the SJRWMD and all other regulatory and cooperating agencies for the purpose of updating and exchanging information. It is our firm belief that a continuous, two-way flow of information and guidance is imperative to meet our proposed licensing schedule.

Changes to POS: None

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
DECEMBER, 1979

Comment 1: A general comment is appropriate concerning detailed design evaluations. We expect the analysis of Plant Design Alternatives will include all reasonable system configurations. However, it is impossible for EPA to determine whether all specific design alternatives will be considered that may have an effect on the environmental categories proposed to be studied. Several specific alternatives are suggested, but it is by no means all inclusive.

Response 1: During the conceptual design phase of the project, all reasonable plant design alternatives will be evaluated from a technical, economic, and environmental standpoint. These evaluations will be summarized in Chapter 9 of the SCA/EID demonstrating the bases for the selected plant design.

Change to POS: None

Comment 2: Reference: Page 1-1, Section 1.1. It was suggested during an early scoping meeting that Florida Power and Light Corp. would participate as a half owner of the proposed facility. We would like to see clarification of any such arrangements in the environmental information document (EID).

Response 2: This will be clarified in Chapter 1 of the SCA/EID, as final negotiations between JEA and FP&L are in progress.

Change to POS: None

Comment 3: Reference: Page 1-3, Section 1.4. The date for resubmittal of the PSD application is given as April, 1980 in the schedule.

Response 3: The PSD application will be made in May, 1980. The POS has been changed to reflect this schedule.

Change to POS: Section 1.4, Page 1-3; Section 6.0, Pages 6-1, 3

Comment 4: Reference: Section 2.2. Statement is also necessary that liquid effluents to waters of the U.S. will comply with standards of performance for "New Sources."

Response 4: All liquid effluents will comply with the Standards of Performance for New Sources, 40CFR Part 423.15.

Changes to POS: None

Comment 5: Reference: Page 3-1, Purpose of Facility. The EIS will contain a section detailing the purpose of the proposed facility. Please explain how this information is to be prepared. If Ebasco will be doing any independent system analysis, please explain the methodology. An analysis of the FP&L system needs would then also be expected if they are to be part of a joint venture.

Response 5: A section has been added to the POS (Section 5) which addresses the preparation of Chapter 1 of the SCA/EID. Both JEA and FPL Need for Power cases will be presented in Chapter 1.

Change to POS: Section 5.0, Pages 5-1,2

Comment 6: Reference: Page 3-4, Section 3.5. All waste categories included in the October 8, 1974 Guidelines and Standards should be specifically included and discussed, i.e., low volume wastes, material storage runoff, etc.

Response 6: Sections 3.5 and 3.6 of the SCA/EID outline have been changed to read as follows:

3.5 Chemical and Biocide Wastes

3.5.1 Liquid Wastes

3.5.1.1 Low Volume Wastes
3.5.1.2 Bottom Ash Transport Water
3.5.1.3 Fly Ash Transport Water
3.5.1.4 Metal Cleaning Wastes
3.5.1.5 Boiler Blowdown
3.5.1.6 Cooling Tower Blowdown
3.5.1.7 Material Storage Runoff

3.5.2 Solid Wastes

3.5.2.1 Bottom Ash
3.5.2.2 Air Quality Control Systems
3.5.2.3 Other Wastes

3.6 Sanitary Wastes

3.6.1 Volumes and Quality

3.6.2 Treatment and Disposal

Changes to POS: Section 3.0, Page 3-4

Comment 7: Reference: Page 3-6, Section 5.0. All discussions of plant operation impacts should be systematic. By this we mean a discussion of (1) waste sources, (2) treatment and then (3) quality of the effluents and probable effects.

Response 7: The discussions will be systematic within the SCA/EID format.

Changes to POS: None

Comment 8: Reference: Page 3-5, Section 4. Construction runoff and site runoff must be discussed, as should pre-operational metal cleaning, concrete batch plant, concrete washing, sewage treatment plant, and other waste pollutants.

Response 8: Discussion of these items is contained in Section 4.1, 4.2, and 4.4 of the SCA/EID.

Changes to POS: None

Comment 9: Reference: Page 3-6, Section 5.1.4. There should be special emphasis on heavy metals in receiving water and in effluents; and the compliance with water quality standard criteria. Also, the toxicity of total residual chlorine should be thoroughly evaluated.

Response 9: All effluent characteristics associated with Standards and Guidelines, as well as water quality criteria, will be addressed. In addition, a chlorine minimization program will be developed for plant operation.

Changes to POS: None

Comment 10: Reference: Page 3-7. At a scoping meeting in Tallahassee, JEA stated that no applications for variances to standards were anticipated at this time. Please explain why such a section has been designated in the EIS outline.

Response 10: This section was included to comply with the State of Florida guidelines as described in DER Form 17-1.122(72).

Changes to POS: None

Comment 11: Reference: Page 3-9. Please define what "other" alternative energy sources are to be considered in Section 8.2.4. Solar power is a viable power source in Florida and should be considered as part of a comprehensive evaluation. We would like to see a "scenario" developed whereby the municipality (JEA) provides passive solar facilities for all new construction within Duval County as an alternative to construction of all or part of the proposed project.

Response 11: Solar power has been specified in the SCA/EID to be assessed as part of Section 8.2.4. Other examples of "other" energy sources to be evaluated include refuse derived fuels, and oil. Scenarios will be developed and evaluated only if threshold criteria for practicability are met.

What defines the threshold?

Changes to POS: Section 3.0, Page 3-9

Comment 12: Reference: Page 3-9. Incorporation of Chapter 9, Plant Design Alternatives, will greatly facilitate JEA's evaluation of the project. We understand that all three sites proposed for evaluation in this POS are to receive equal emphasis until February, 1980, at which time the Applicant will select a site to propose for permitting. This would apply to gathering of environmental inventory data but how extensive is the environmental assessment to be of sites not selected?

Response 12: The environmental assessment of the other candidate sites will be contained in Section 8.3 of the SCA/EID and will consist mainly of those environmental factors which, after two to four months of field monitoring, could be considered site differentiating. This discussion will be weighed with that of other site differentiating criteria such as engineering feasibility and costs to provide a discussion of the assessment of alternative sites.

Changes to POS: None

Comment 13: Reference: Page 3-9, Section 8.1.2. Omission of the Proposed Project. As part of this section we would like to see the upgrading, conversion or expansion of present oil-fired capacity seriously evaluated.

Response 13: A sub-section (8.1.7) has been added to Section 8.1 of the SCA/EID to address upgrading, expansion, and/or conversion of existing units.

Changes to POS: Section 3.0, Page 3-9.

Comment 14: Reference: Page 4-8, Section 4.1.6. Air Quality Assessment. When source interaction modeling is performed, the present maximum emission for the existing source(s) should be used. However, if a source or area is presently out of compliance but is expected to have reduced pollutant emissions or reduced ambient concentrations in the future, this situation, too, should be modeled.

Response 14: The POS will be changed to reflect the collection of the additional information necessary to consider both present and expected future conditions.

Changes to POS: Task 4.1.1, Page 4-2.

Comment 15: Reference: Page 4-8, Section 4.1.6. Air Quality Assessment. Please explain the qualitative assessment of plant impact on visibility, acid rain and trace element concentrations. There are quantitative methods for estimating sulfate concentrations which should be considered.

Response 15: The qualitative assessment of trace element impact from the proposed plant will be developed upon a data base derived from a detailed survey of published literature. The literature survey will focus upon studies conducted at operating coal-fired generating facilities. These studies would provide information on trace element inputs from the coal, trace element distribution into combustion by-products, various combustion parameters (coal input rate, heating value of coal, combustion temperature, boiler and furnace design), air quality control systems, stack emission rates, and trace element concentrations in bottom and fly ash.

Information on the ecological implications of trace element release will also be generated from the literature survey. The general types of data to be sought from the literature include: trace element injury threshold concentrations for both floral and fauna species, potential for accumulation in flora and fauna, migratory pathways within environment, ambient concentrations in air, soil, flora and fauna, and known sources of trace elements. It whould be noted that, in the absence of such data, there is no intent to generate data via separate studies.

Comparisons of design and operational characteristics will be made between the plants reported in the literature and the proposed plant. On the basis of similarities, the behavior of trace elements from the proposed facility will be estimated. These estimates will then be evaluated on the basis of the biological data generated and an assessment of the resulting impact formulated. The results will be included in Section 5.3.5 of the SCA/EIA.

The need for a visibility assessment has been discussed with FDER and with personnel from the New Source Review Section of EPA. Both groups have indicated that a qualitative or semi-quantitative assessment of visibility impacts on Class I PSD areas is all that they expect. The approach we intend to use both for the PSD application and for Section 5.3.5 of the SCA/EIA is consistent with what we believe FDER and EPA expects. The POS will be revised to indicate that we will make an assessment of maximum short-term and long-term particulate concentration increases in the vicinity of Class I areas based on our standard dispersion modeling results. Using an extremely simplified relationship, estimates will be made of percentage visibility reductions which might be expected due to particulates alone. This will be combined with estimates of the amount of time per year that the plume will be expected to be carried to the area by the winds. However, no attempt will be made to use any of the sophisticated models available to analyze the impact of the plume on any particular viewshed because these models have not yet been properly validated and we are not aware of any attempts to apply them under high humidity conditions such as one finds in the Southeast U.S. This position will be reevaluated once EPA proposes visibility protection rules (expected in the spring of 1980), and our approach to visibility impact assessment for the SCA/EIA will be revised accordingly.

We accept the suggestion that quantitative methods for estimating sulfate concentrations should be considered rather than the qualitative approach and will modify the POS to indicate that this approach will be utilized. We intend to modify our multisource CRSTER model to include a simple time dependent $SO_2 \rightarrow$ sulfate conversion mechanism. This will allow for estimation of maximum short-term and long-term sulfate concentrations as a function of distance and direction from the plant site. Impacts due to the proposed plant alone and in combination with other existing and planned sources will be estimated.

Changes to POS: Task 4.1.1, Page 4-2; Task 4.1.3, Page 4-6; Task 4.1.6, Pages 4-9, 10.

Comment 16: Reference: Page 3-9, Section 8.3. Assessment of Alternatives. Evaluation of three sites (Walkill, Willis Point, and Eastport) is not sufficient for the EPA's alternative sites evaluation in the EIS. We would encourage further assessment of alternative sites in the United Engineers Study. According to our records, this study was never provided to the EPA, which we believe will be necessary information for our subsequent siting analysis.

Response 16: A summary of the site evaluation studies, which evaluated approximately 20 site areas, performed by United Engineers and Constructors (UE&C) will be included in the SCA/EID. Copies of the UE&C reports will be provided to EPA by the JEA.

Changes to POS: None

Comment 17: Reference: Page 3-10, Section 9.3. The alternatives of (1) zero discharge of ash sluice water pollutants, (2) no discharge of anything except cooling tower blowdown, and (3) dry bottom ash handling system should be included. Also, water pretreatment, at least sedimentation siltation ponds for storm and roof drains and tower blowdown, should be another system alternative. For the Eastport site alternative, use of Northside Station discharge as makeup to the cooling towers should be stressed. A tower blowdown discharge to the existing Northside discharge should be considered for dilution advantages.

Response 17: Alternatives for the ash handling system will be addressed in the SCA/EID Sections 9.3.3, 9.5.2, and 9.5.3. The alternative for zero discharge will be evaluated in the development of the Water and Waste Management Study. The Plant Design Alternatives, Chapter 9.0, portion of the SCA/EID, will directly reflect the alternatives discussed in this Study. Zero discharge includes the examination of a dry bottom ash handling alternative. The alternative of "sedimentation siltation ponds" for cooling tower blowdown is not being evaluated.

Alternative heat dissipation schemes for the Eastport Site emphasize the use of the Northside cooling water intake and discharge. This alternative will be discussed in Sections 9.1 and 9.3.

Changes to POS: Task 4.2.6, Pages 4-19, 20

Comment 18: Reference: Page 4-11, Section 4.1.7. There should be a complete assessment of the potential for stack emissions interacting with cooling tower plumes and the resultant pollutant formation.

Response 18: We will predict the expected frequency of interactions based on geometric considerations and develop an estimate for the potential for sulfuric acid formation in the areas of interaction. Guidance from EPA and FDER on pollutant conversion rates under these conditions will be sought.

Changes to POS: Task 4.1.6, Page 4-8; Task 4.1.7, Pages 4-12,13

Comment 19: Reference: Page 4-8, Section 4.1.8. Dependent upon site selection for a plant, the analysis of salt water cooling tower emission effects will be required. Will JEA consider a salt water cooling tower? Assessment of salt water drift will be significant problem if much background data is necessary. Ambient atmospheric fallout levels may be needed.

Response 19: Presumably, this comment would also apply to brackish water towers. Although not specifically pointed out in the POS, it is our intention to perform such a study. Further, since EPA has verbally indicated that suspended particulates from salt (or brackish) water cooling tower drift will consume PSD increment, the analysis will need to be part of the PSD report as well as the SCA/EID.

Changes to POS: Task 4.1.7, Pages 4-12, 13

Comment 20: Reference: Page 4-8, Section 4.1.6. As part of the assessment of air quality impacts we would like to have a detailed assessment of accidental emissions. Consider the potential for excessive emissions above allowable PSD limits for criteria pollutants. Also, please consider what groundlevel impacts might result and whether the occurrance could cause irreversible environmental damage or severely curtail other beneficial uses of the environment.

Response 20: Although we do not believe that very much meaningful information will be produced by such an analysis, one will be performed, based on whatever information we can obtain on AQCS reliability. The significance of these conditions with respect to environmental damage thresholds will be evaluated.

Changes to POS: Task 4.1.6, page 4-9

Comment 21: Reference: Page 4-29, Section 4.3. Groundwater Hydrology/Quality. Accurate information on the depth to the surface groundwater table will be very important as will the groundwater gradient for the potential plant sites.

Response 21: Piezometer nests have been installed and are being monitored. There is sufficient piezometer density to more than adequately document the change in water table (storage) with time and the vertical and horizontal component of local groundwater movement.

Changes to POS: None

Comment 22: Reference: Page 4-51, Section 4.5.4. Impact Assessment. We believe that it is possible to present some indication of the extent of predicted concentrations of air pollutants.

Response 22: We can give some indication as to the size of the area affected by but not to the amount of vegetation affected.

Changes to POS: Task 4.5.4, Page 4-58

Comment 23: Reference: Page 4-57, Exhibit 4.6.1. Oyster beds should be included as part of habitat mapping.

Response 23: Oyster beds, as well as all other aquatic habitats in the vicinity of the site, will be included in the habitat mapping.

Changes to POS: Exhibit 4.6-1, Page 4-65

Comment 24: Reference: Page 4-58. Discussion of fisheries sampling does not indicate time of day. There is also an avoidance factor, here, and nighttime or reduced light sampling is preferred.

Response 24: Due to the depth, color, and turbidity of the water of the St. Johns River, avoidance due to light conditions is not anticipated as a problem with otter trawl. The density of crab pots precludes trawling at night. Gill nets are being fished overnight. We feel that when using the haul seine, fish overlooked due to poor light condition, counter balances avoidance encountered under good light conditions.

Changes to POS: None

Comment 25: Reference: Page 4-75, Section 4.8.7. Socioeconomic Assessment. Part of this analysis should be a complete consideration of the effect on land values surrounding the proposed sites as related to changing land uses. A listing of socioeconomic costs (page 4-76) is not good enough.

Response 25: Property values related to changing land uses will be considered as a part of the land use analysis in cases where the construction of a power plant and related facilities precludes current or planned use.

Changes to POS: None

Comment 26: Reference: Page 4-19, Section 4.2.6. Multiport diffusion should be specifically evaluated.

Response 26: The use of a multiport diffuser for the plant's thermal discharge will be discussed briefly as an alternative in Chapter 9 of the SCA/EID. It is unlikely, however, that this concept would be used given the situation at the Eastport site and the availability of the Northside plant discharge for blowdown injection.

Changes to POS: None

Comment 27: Reference: Page 4-23. Water Quality Monitoring. Silica, manganese and aluminum are other parameters potentially present in plant discharges from coal and ash handling. We question whether quarterly sampling, yielding only four samples per parameter, is sufficient, statistically. Both suspended and dissolved metals should be determined.

Response 27: We recognize that silica, manganese and aluminum may potentially be present in plant discharges. These parameters will be tested for as part of our groundwater quality program. Table 4.3-1 in the POS lists the chemical parameters that will be tested for to establish baseline groundwater quality.

We are of the opinion that quarterly sampling is sufficient to establish baseline water quality conditions. The frequency may of course change during operation of the plant. These will be addressed at some later time and is dependent on the results of the baseline conditions.

An explanation of our approach to suspended and dissolved metals is provided in Table 4.3-1.

Changes to POS: Table 4.3-1, Pages 4-24, 25

Comment 28: Reference: Page 5-1, Section 5.1. Project Schedule. EPA continues to strive toward a combined state and federal environmental review of proposed generating stations in Florida. We believe this can be accomplished on the JEA project. However, the EPA will not issue a final EIS until after the State of Florida has certified the site and certified the NPDES permit. Therefore, we will schedule a final EIS approximately four weeks subsequent to state certification. This would potentially enable the Agency to take final action in issuing the NPDES permit approximately March, 1982.

Response 28: The schedule has been adjusted to this timetable.

Change to POS: Exhibit 6.1-2, Page 6-3

Comment 29: An estimate of manpower effort could not be found in the POS. A breakdown of manday effort by task should be presented so that the reviewer can determine relative effort.

Response 29: We believe that the descriptions of field monitoring programs and levels of analyses to be performed found in the POS are sufficient to determine relative level of effort. Manday expenditure estimates, in that they are potentially misleading and are only estimates at best, will not be included in the POS.

Changes to POS: None

Comment 30: Reference: Page 4-25, Section 4.2.10. Impact of Plant Construction on Surface Water Quality. Construction techniques and impact from barge unloading facilities should also be addressed to include dredging and mooring and navigational impairment as appropriate.

Response 30: References to the ocean vessel coal offloading facility have been inserted throughout Section 4 of the POS. Special attention will be given to fugitive dust emissions (Task 4.1), spoil area runoff (Task 4.2), water supply (Task 4.3), disturbance of wetlands and other terrestrial features (Task 4.5), dredging impacts (Task 4.6), and land use impacts (Task 4.7).

Mooring and navigational impairment are normally considered as an engineering rather than environmental issue, and addressed by means of compliance to Corps of Engineers channel offset requirements.

Changes to POS: Tasks 4.1 - 4.8

Comment 31: Reference: Page 4-26, Section 4.2.11. It is also appropriate to assess the potential for pollutant spills and to consider whether such accidents would significantly restrict other beneficial uses of the St. Johns River or its tributaries.

Response 31: Potential, prevention, and containment of pollutant spills will be addressed in the Best Management Practices Document issued in conjunction with the NPDES Permit Application and in the SCA/EID.

Changes to POS: None

U. S. DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE

December, 1979

Comment 1: The sampling schedule for vertebrates appears to be inadequate. Sampling should be done more than once each season for each species. Include description of habitat requirements of floral and faunal species found in that area (eg., type and amount of areas necessary for food, cover and reproduction). Should also include abundance and diversity of plant and animal species found in the area.

Response 1: In a subsequent communication, Mr. Creamer of the F&WS stated that this was a generic comment pointed at the entire sampling scheme. We stated that a description of the habitat requirements of important faunal species will be included as part of a general site description. Abundance and diversity will be determined for the various plant communities while estimates of animal abundance and diversity will not be given. The sampling effort for faunal species will be qualitative and not quantitative in nature.

Changes to POS: None

Comment 2: Should sample small mammals in fall (September - October) or in spring (May - June) since this is when they are most active. Four trap nights does not seem adequate.

Response 2: An additional small mammal trapping effort will be performed in May or June, giving a total of two trapping efforts, one in the late fall and one in the spring. Forty traps will be run for three nights in each habitat type, giving a total of 120 trap nights per habitat; not four trap nights as stated in the comments.

Changes to POS: Task 4.5.3, page 4-52

Comment 3: Waterfowl. Include vegetation species in potential waterfowl areas. Waterfowl begin moving north as early as February, so observations should begin then.

Response 3: After reviewing aerial photographs and consulting with Steve Nesbitt (Florida Fish and Game), it has been determined that no significant waterfowl areas exist on or near the site.

Changes to POS: None

Comment 4: Inventory of Reptiles and Amphibians. Should use drift fences to sample Herp populations.

Response 4: A spring sampling of reptiles and amphibians using drift fences will be included. This sampling, however, will generate qualitative data only. Fences will be placed in appropriate locations including the oak scrub area at the Eastport site.

Changes to POS: Task 4.5.3, page 4-54

Comment 5: In Task 4.6.2, planned sampling calls for seasonal sampling over a ten-day period each quarter. This may not reflect the true indigenous or migratory populations of fish at the project site. Multiple random sample periods nested within each season will provide better indications of population composition and fluctuations. Electrofishing should be a standard sampling device rather than supplemental as planned.

Response 5: Fisheries sampling is done quarterly (13-week intervals) using various methods which are not used simultaneously. At this time, construction of a closed cycle cooling system is the only plan under consideration. Makeup water will be withdrawn from the discharge side of the Northside Station. Blowdown will be released into the Northside discharge. Under these conditions we feel that this sampling is sufficient to assess any impact on the fish population. We have not included electrofishing as a standard sampling device in the POS because the conductivities encountered at the site preclude its use.

Changes to POS: None

Comment 6: Phytoplankton. Grab sampling would not provide accurate information of phytoplankton communities. Pump or towed nets similar to methods used for zooplankton samples would be better. Sampling at each station should include samples from various levels throughout the water column as will diurnal and nocturnal sampling.

Response 6: We feel that whole water samples better characterize the phytoplankton community since net or pump methods are biased against nannoplankton and even larger algae. EPA publication 670/4-73-001 specifically advises against net and pump sampling for these reasons. See NMFS comment 3 and response.

Changes to POS: None

Comment 7: Macro benthos - drift sample methods should also be incorporated.

Response 7: See attached letter, L. Glenn McBay to H. L. Davis dated January 4, 1980.

Changes to POS: None

Comment 8: Manatees. All known warm water discharges of the area should be monitored weekly for water temperature and the presence of manatees. This will give indication of the potential attractiveness of these discharges to this mammal.

Response 8: We agree with this suggestion and began weekly monitoring of the three existing power plant discharges on the lower St. Johns River for the presence of manatees on Jan. 14, 1980. Monitoring will continue until March 15, 1980.

Changes to POS: Task 4.6.2f, page 4-66

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Federal Building, Room 332
BRUNSWICK, GEORGIA 31520
JAN 4 1980

Dr. H. L. Davis
145 Technology Park
Norcross, GA 30092

Dear Dr. Davis:

This is in regard to our comments dated December 3, 1979 concerning the "Site Certification Application and Environmental Impact Assessment Plan of Study" for Jacksonville Electric Authority. We have discussed our comment, paragraph 4.6.2(c), with Dr. Quentin Waits regarding sampling by use of drift nets. Since towed net sampling will be employed and there is some question about drift net effectiveness in tidal waters, we suggest you delete our recommendation that drift sampling methods be incorporated in the plan of study. We also suggest that bi-monthly sampling may not be productive if larvae of anadromous fish are the target species. The spawning cycle is relatively short once a specific water temperature occurs. You may want to consider initiating sampling near 60° F and conduct it at greater frequency until 70° F is reached.

Please advise if we can be of further assistance.

Respectfully,

L. Glenn McBay
Field Supervisor

Supplemental Comment (1/4/80):

We also suggest that bi-monthly sampling may not be productive if larvae of anadromous fish are the target species. The spawning cycle is relatively short once a specific water temperature occurs. You may want to consider initiating sampling near 60°F and conduct it at greater frequency until 70° is reached.

Response: At this time construction of a closed cycle cooling power plant using the Northside discharge as makeup is the only plan under consideration. Under these conditions, we and the EPA feel that bi-monthly sampling of ichthyoplankton is sufficient to assess any impact on the reproductive cycle, eggs, or larvae of affected freshwater, anadromous, or marine fish species. Additionally, during the time period bounded by the rise in temperature from 60° - 70°F (i.e. December, January, February, and March), we feel that bi-monthly sampling is often enough to ascertain spawning in anadromous species.

Changes to POS: None

U. S. DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL MARINE FISHERIES SERVICE

DECEMBER, 1979

Comment 1: The sampling procedures outlined are inconclusive and lead the reader to assume that no definitive project decisions have been made. Resulting numerical values obtained from the study would adequately define only species diversity for relatively confined sections of the St. Johns River. Although diversity indices provide useful information about aquatic ecosystems, their indirect relationship to recreational and commercial fisheries require that direct measurements of certain parameters be made to determine trends. Variation inherent in the sampling methods described would necessitate a more frequent sampling schedule be employed, i.e., monthly, bi-monthly. Proposed sampling stations are to be located in relatively ill-defined zones at unspecified distances above and below the plant site. These areas would then be sampled for 10 randomly selected days on a seasonal basis. These procedures could lead to consecutive sampling periods, i.e., the last ten days in March and the first ten days in April, thereby adding additional bias to the sampling procedures. Monthly samplings at well-defined locations would help to reduce this bias.

Response 1: A more detailed plan for the aquatic ecology field and laboratory programs has been prepared. We feel that this program is definitive. It is based on preliminary field surveys and sample analysis. This program has been reviewed and accepted by EPA and FDER and has been made available to NMFS for a similar review. We contend that the level of effort with particular regard to the sampling frequency is sufficient to describe the aquatic ecosystem and predict the impact of a closed cycle cooling system. Certain aspects of the aquatic ecology program are sampled at greater frequencies than quarterly. For example, the ichthyoplankton are being sampled twice per month during the winter and spring and monthly during the summer. Regular weekly surveys for manatee occurrence are being conducts at four major thermal effluents during the cold months.

Changes to POS: None.

Comment 2: Initial field reconnaissance surveys should have been conducted prior to submission of a Plan of Study. This would lead to more definitive statements about the estuarine communities to be sampled and the most useful sampling gear.

Response 2: Although this was not presented in the POS, this approach was used in selecting the communities to be sampled, specific field gear to be used and optimum sample size and analytical methods to be employed. For example, we found it necessary to sample additional areas for benthic macroinvertebrates as well as a much larger sample size in order to obtain a more representative sample due to the depauperate nature of the benthos in the study area. On the other hand, certain communities originally planned to be sampled, e.g., submerged macrophytes, phytoplankton and periphyton, were deleted due to the insignificance of the potential impact.

Changes to POS: None.

Comment 3: Gear type and procedures used for taking "grab" samples need further explanation.

Response 3: Phytoplankton, as mentioned above, no longer are considered as part of the aquatic ecology program since JEA selected the Eastport site. The decision to delete phytoplankton was based on the fact that the river at Eastport is influenced strongly by tides and exhibits rapid flushing and low residence times. Furthermore, phytoplankton have a relatively fast regeneration rate and the proposed power plant would have an insignificant impact, i.e., closed cycle with makeup water being withdrawn from the discharge of the JEA Northside power plant.

Changes to POS: None.

Comment 4: Regarding the proposal to sample with an otter trawl, we recommend that a measured distance be sampled each time. This would allow a better comparison of data than would be possible with sampling over a given time period. The number of gill nets to be used, the type of set to be employed (drift or stationary) and the mesh sizes should also be included. We concur with the proposed use of electro-shocking and recommend it be a primary sampling technique. We further suggest that fisherman surveys, both recreational and commercial, be included in the project design. These surveys could be initiated in each area or section of the river under study for one day during the week and the weekend each month to provide information on harvest or yield, effort and success rates for each section. This would lend merit to the proposed mapping of fishing grounds.

Response 4: Fish sampling by the use of otter trawls is performed in duplicate. One 25 minute tow is made with the current and a second 25 minute tow is made against the current, both tows being made at a constant throttle setting. Theoretically, distance traversed as well as volume of water fished should be constant for the composite of the two tows thereby allowing a comparison of the data collected at each station and during different seasons.

Electrofishing cannot be performed because of the high conductivities of the water in the St. Johns River in the vicinity of the plant site. Limited electrofishing is being performed in a small freshwater stream near the plant site.

Monofilament experimental gill nets are used to sample fish. Each net has five different sized mesh panels measuring 25 feet long by 6 feet deep. Consecutive stretched mesh sizes are as follows: one, two, three, four, and five inches. The gill nets will be anchored perpendicularly to the current at each station and fished twice from dusk to dawn every 13 weeks.

Creel surveys to determine harvest, effort, and success rates for each zone are not being performed systematically or quantitatively because it is felt the fisheries program is adequate for the level of impact expected from the construction and operation of the proposed power plant.

Changes to POS: None

Comment 5: This section should include the gear types, the number of tows, and mesh sizes to be used, e.g., 505 u or 333 u mesh, etc. Also, the entire water column should be adequately sampled. In this regard, we would suggest oblique tows sampled at a consistent time both day and night.

Response 5: Ichthyoplankton will be sampled in each of three zones in the Blount Island channel. The central zone, Zone 2, includes the intake and outfall of the present JEA "once through cooling" plant. Zones 1 and 3 are immediately upstream and downstream of Zone 2. Replicate surface and bottom tows are made using 0.5 meter diameter, 363 u ichthyoplankton nets. Surface tows use outboard arms fished from the bow of the sampling craft. Bottom tows utilize an epibenthic sled. Inboard and outboard flow meters monitor water volume sampled and serve as a check for clogging. Sampling stations within zones are randomized. Bi-monthly sampling is scheduled for January through June inclusive, with monthly sampling during the summer and one sample episode in the fall. Incoming and outgoing tides are sampled during each sampling episode.

The proposed 2-600 MW coal-fired units are designed as closed-cycle cooling with cooling water being withdrawn from the discharge of the existing Northside Plant. Entrainment studies on the present generating plant are considered to be sufficient to preclude oblique tows, i.e., discharge waters are well mixed. Entrainment study equipment, e.g., nets and meters, are identical to that used in ichthyoplankton sampling of Blount Island channel.

Only nighttime sampling was considered for channel and entrainment sampling. It was felt that daylight sampling would introduce bias through net avoidance by ichthyoplankton. As light intensity increased with decreased depth, avoidance would increase, introducing bias within daylight samples. Bias then would be compounded in comparisons between daylight and nighttime samples. By using only nighttime sampling when net avoidance is minimized, samples are collected under conditions of worst possible impact.

Changes to POS: None.

Comment 6: The methods for assessing species composition and standing crop for both macrophytes and periphyton need elaboration.

Response 6: Both investigations of periphyton and macrophytes have been deleted from the aquatic ecology program. Investigations of the salt marsh and other wetland communities which occur on or adjacent to the Eastport site are addressed in the terrestrial ecology program. Submergent grass bed communities, which are important communities further upriver, do not occur in the estuary near Eastport.

Changes to POS: None.

CLAY CITIZENS COALITION

NOVEMBER, 1979

Comment 1: Air Quality/Meteorology - No consideration was given in this portion of the Plan of Study to the coal dust that will be emitted from the coal trains en route to the proposed plants. Any air quality study must take into account the impact on the air quality of the areas surrounding the tracks. This "strip" pollution has not been adequately addressed in the Plan of Study. To do this, the exact route and number of trains must be determined before proceeding with the study of this element.

Response 1: Although we do not now believe that this will be a significant problem, we feel that there is enough concern to warrant a modification of the POS. Therefore, we propose to conduct a literature search on this matter, and based on the results, attempt to develop an emission factor, and ultimately make a prediction of resulting TSP concentrations. If a significant impact is predicted, mitigative measures will be recommended.

Changes to POS: Task 4.1.1, Page 4-2; Task 4.1.6, page 4-8

Comment 2: Surface Water Quality - The surface water quality monitoring program only takes into account the surface waters on and adjacent to the proposed sites. This ignores the many lakes in the Clay County area which will be affected by the air pollution coming from the proposed plants. The acid rainfall associated with coal plants will only worsen the acidity problem which exists in the lakes of Clay County. Any increase in acidity will result in a decrease in the productivity of these lakes which will adversely affect those animals and birds, including bald eagles, which use the lakes as a source of food. Monitoring must include these lakes and the Plan of Study must include the adverse effects of the coal plants operation on them. The impact on these surface waters must also take into account the pollution from the two Seminole plants in Putnam County.

Response 2: EPA Region IV (Item 15 of their December 6, 1979 letter) and the Clay County Citizens Coalition (Item 2 of their November 24, 1979 letter) are concerned about acid rain and our approach to addressing this subject. Although their concern about acid rain is valid, we have two problems with the issue. First, acid rain is at least a regional rather than source-specific problem and hence should more properly be addressed by a regional authority (i.e., State of Florida or Region IV EPA) than by any one applicant. Second, there is insufficient definitive information on acid rain formation and transport mechanisms both in the atmosphere and in soils and water bodies.

The EPA and other government and nongovernment groups have just taken the first steps toward clarifying these formation/transport mechanisms as well as toward defining the impacts on the ecosystem. Therefore, we believe that a regional, qualitative acid rain study addressing existing and future pH levels in precipitation and water bodies in northeast Florida and the impacts of any changes on the ecosystem cannot reasonably be expected as part of our scope of work.

There are a number of things that can be done, however, and we propose that the POS be revised to include them. First, the Met/AQ literature survey will be expanded to include precipitation chemistry data for the general region including the site. Second, the Met/AQ and other disciplines' literature surveys will be expanded to include a search for information on acid rain formation, transport and impacts due to similar facilities. Finally, given this information, a discussion will be developed which identifies in a qualitative sense any acid rain impacts that might be expected due to the operation of the plant in combination with existing and proposed (which permits have been applied for) facilities in the area. This discussion, which will become part of Section 5.3.5 of the SCA/EIA (but which will not be included in the PSD report), will attempt to relate the magnitude of expected changes in air pollutant emissions in Jacksonville to emission changes which have produced acid rain impacts, assuming that this sort of information is available. The discussion will also include the results of any of the ongoing research programs which become available by the fall of 1980.

Changes to POS: Task 4.1.1, page 4-2; Task 4.1.3, page 4-6; Task 4.1.6, page 4-9

Comment 3: Terrestrial Ecology - Againk this portion of the Plan of Study is far too limited. The adverse effects on wildlife will extend far beyond "the proposed power plant site and corridors." For example, bald eagle sightings have been made throughout Clay County and they will certainly be affected by the proposed plants. Any study of the ecology must extend beyond the plant sites and include the entire county.

Response 3: The terrestrial ecology study will address vegetation patterns and typical wildlife species occurring within Duval County, although the information presented will be qualitative in comparison to the quantitative data generated from the onsite sampling program. The countywide data will be derived primarily from the Florida Game and Fresh Water Fish Commission. The discussion of terrestrial ecology will include a regional perspective which will not only include Duval County but part of northeastern Florida. Generalized vegetation trends and patterns will be addressed from this perspective. Particular attention will be directed to areas potentially affected by air contaminants originating from the proposed plant.

The location of bald eagle nests within the immediate vicinity of the proposed site will be included in the terrestrial ecology section. Contact has already been established with S. Nesbit and Florida Audubon Society to pinpoint nest locations within the vicinity of the proposed plant. Particular attention will be directed to those areas where potentially adverse affects might occur. It is our opinion that the principal factors affecting the bald eagles will be habitat disturbance and human activity. These factors or effects will be localized and will not affect eagles beyond the immediate vicinity of the proposed plant. Therefore, studying eagles in those portions of Duval County not affected by the proposed plant will be of little value. We will attempt to obtain the location of each sighting in Duval County and determine whether or not the proposed plant will have an effect on them.

Changes to POS: Task 4.5.1, page 4-47

Comment 4: Archeological Studies - The Plan of Study only calls for the consultation of a Florida archeologist. This is inadequate. To determine the potential historical importance of any of the three proposed sites an interdisciplinary approach must be taken. At the very minimum, a Florida historian must be consulted to guide the study and interpret the results of any archeological find.

Response 4: This comment requests an interdisciplinary approach to archeological studies including consultation with a Florida historian. This is a correct approach, although team members do not necessarily need to be from Florida as long as they are familiar with the region.

Changes to POS: Task 4.7.3, page 4-71

Comment 5: Socioeconomics - This portion of the Plan of Study is particularly inadequate. No consideration has been given to the impact coal trains will have on the areas through which they will travel to get to the proposed plants. The field study will only survey the proposed site and directly associated transmission lines. The study would, therefore, be inadequate as to the true costs of placing these plants in either of the Clay County sites.

To determine the socioeconomic impact greater attention must be given to the question of transporting the coal. The routes and number of the coal trains must be set out prior to a study of the proposed sites since the population density of the areas surrounding the train rails to the plants in Clay County vary dramatically. In addition, the routes must be set out so that the tracks can be studied to see if they can handle the increased train traffic. The cost of any upgrading of the tracks must be used in making the cost/benefit analysis, as should the cost of relocating the many schools located next to the tracks and the cost of building overpasses to relieve the vehicular conjestion caused by the train traffic.

The Plan of Study is also inadequate as to its dealing with costs such as damage to health caused by the plants' operation as well as the property damage caused by the operation of such plants. Any cost/benefit analysis that did not include such social cost would be of little value in assisting the advisability of any of the three possible sites.

Response 5: The impact of coal trains will be covered in the five mile and regional analysis portions of the study. This will require designation of alternative routes and the estimation of economic and social costs and benefits. The plant will be required to conform with National and Florida Ambient Air Quality Standards. The National Primary and Secondary Ambient Air Quality Standards have been designed to protect public health and welfare. The Florida Ambient Air Quality Standards are either the same as or more stringent than the National standards, depending on the pollutant. Since the plant will meet these standards, there will be no health effects which could meaningfully be considered in the cost/benefit analysis. Property damages, if predicted, are to be incorporated in the study.

The impact of coal trains has been a topic of concern. This aspect is to be considered as part of the infrastructure analysis. Also, see Comment/Response 3 - Clay County League of Women Voters.

Changes to POS: None

Comment 6: Need - The JEA should be required to have an open hearing on the need for these plants, similar to the scoping hearing held on the environmental impact of the plants. In this regard the Coalition has been trying for over a year to obtain answers to demand projection questions. Without answers to these questions are as follows:

A. Were correlations based on absolute amounts or on change from year to year? (i.e., total demand vs. population or increase in demand vs. increase in population.)

B. What are the projections of population, labor force, and other business and economic series used to determine the projection of energy demand?

C. Identify those rate class projections which were based solely on the mathematical projections and which were modified by judgement of the consulting engineers. What were the original projections?

D. What were the formulas used to project each rate class? What are Beta weights for each factor?

E. What is the assumed interest rate on the bond issue? Service Charge? Court costs? Brokerage fee?

F. Does the amount to be financed include FP&L's share of the total cost?

G. What were the rates assumed for each rate class projection of demand used for estimating system revenue?

These questions should be addressed by the JEA and Ebasco.

Response 6: The joint JEA/FP&L Need for Power case will be addressed in a manner consistent with the FDER requirements set forth in Form 17-1.122(72) and presented in the SCA/EID in Chapter 1. Consequently, the Site Certification/EIS hearings will address need as well as environmental considerations.

An additional section has been added to the POS (Section 5) to further explain the contents of SCA/EID Chapter 1 and our approach to answering the Clay Citizens Coalition Comment 6 are discussed therein.

Changes to POS: Section 5.0, pages 5-1, 2

Comment 7: Summary - The Plan of Study must be changed to take into account the total impact of the many coal plants proposed for this region of the state. To allow the JEA to study only the impact their plants will have, without regard to the other proposed plants, will have a devastating impact on our region. It will, in effect, allow the piecemeal destruction of Northeast Florida.

Response 7: Regional issues, where appropriate, will be addressed by the POS (e.g., air quality, acid rain, etc.). However, it is our opinion that general responsibility for this type of approach, particularly with respect to other proposed plants, lies with the state and federal regulatory agencies. Their structures and mandates are directed specifically toward the coordination and monitoring of environmental concerns on a distruct, statewide, and regional basis.

Changes to POS: None

Comment 8: Finally, it would seem advisable to require the JEA to consider alternate energy forms, such as gas, oil/coal mixture, nuclear, solar power, cogeneration, conservation, and phase liners prior to putting the state and the JEA's customers to the expense of the site selection proceedings.

Response 8: The consideration of alternate energy forms is included in Chapter 8 of the SCA/EID. The assessment of the availability, feasibility, and reliability of these alternatives is, therefore, available to the public through the Site Certification/EIS process.

Changes to POS: None

CLAY COUNTY LEAGUE OF WOMEN VOTERS

NOVEMBER, 1979

Comment 1: The need for the power plants must be addressed in the EIS, in addition to what JEA will provide in their study for the PSC. The need must be shown in the EIS to prove it outweighs the environmental and socioeconomic impacts.

Response 1: Refer to Comment/Response 6, Clay Citizens Coalition.

Changes to POS: Section 5.0, Pages 5-1,2

Comment 2: The need for the power plants <u>in Clay County</u> must be addressed in the EIS, in addition to what JEA will provide in their study, to prove the need is greater than the environmental and socioeconomic impacts <u>in Clay County</u>.

Response 2: This is no longer a substantive issue with the selection of the Eastport Site in Duval County.

Changes to POS: None

Comment 3: Great emphasis must be included in every phase of the Land Use/ Socioeconomics section of the EIS, re: the effect on quality of life, property values, people, community services, etc., with particular attention to the impact of transmission lines and transportation of fuels.

Response 3: The socioeconomic analysis for the SCA/EID includes the site area, five mile area, and region. This will include transmission lines and fuel transportation corridors.

Changes to POS: Task 4.8.7, Page 4-84

Comment 4: Special attention should be given in the EIS to our bald eagle nests along the St. Johns River, not only at the site selected. Contact should be made with Doris Mager of the Audubon Socity Raptor Research & Rehabilitation Program at Maitland.

Response 4: Special attention is being given to the bald eagles along the St. Johns and in those area(s) where effects may occur. Contact has been made with S. Nesbit and Fla. Audubon Society to obtain locations of existing nests. Any effects from the proposed plant on these locations will be determined.

Changes to POS: None

Comment 5: The EIS should include a study of the historic site of Ft. Pupo, five miles southeast of Green Cove Springs, built in 1716 across the St. Johns River from Ft. Picolata in St. Johns County.

Response 5: All known historic locations on the power plant site will be closely studied as part of the archaeological investigation.

Changes to POS: None

Comment 6: Special attention should be given in the EIS about Clay County's land use and zoning at both prospective sites, describing all alternative methods of securing proper zoning, time schedules, costs, etc. It must be addressed in the EIS the possibility and effects of the proposed annexation of Reynolds Park into the city limits of Green Cove Springs and the attendant zoning and land use requirements if that takes place.

Response 6: This is no longer a substantive issue with the selection of the Eastport Site in Duval County.

Changes to POS: None

Comment 7: Address in the EIS the feasibility and cost of requiring other polluting industries in the Eastport area of Duval County to clean up, as against building new plants in Clay County.

Response 7: The necessity for obtaining emission offsets in the Eastport area will be addressed initially in the Prevention of Significant Deterioration Report which will be submitted to the EPA in May, 1980. It will also be addressed in the SCA/EID.

Changes to POS: None

Comment 8: Address in the EIS alternative methods and cost of generating electricity at JEA's present plants in Duval County--rebuilding or converting to gas, garbage, etc., as opposed to building new plants. Mr. James Shivler, Chairman of the Energy Committee of the Florida Chamber of Commerce: "State taxpayers cannot afford cost to convert enough power plants to coal to meet the 50% reduction in oil use at power plants. Florida may be unable to afford a proposed mandate to cut in half by 1990 electricity use of oil as a power plant fuel and switch to coal."

Response 8: Refer to Comments/Responses 6 and 8, Clay Citizens Coalition.

Changes to POS: Section 5.0, Pages 5-1,2

Comment 9: Cost should be evaluated in EIS, re: transmission of electricity back to Jacksonville from Clay County site, along with repairing and/or replacing existing outdated substations and lines.

Response 9: These costs were evaluated as part of the site selection process and will be discussed in Chapter 8 of the SCA/EID.

Changes to POS: None

Comment 10: Discuss in EIS possibility of using transmission lines of Clay Electric from Titanium plant in southern Clay County to steel mills at Baldwin which also will tie into Seminole plant lines.

Response 10: This possibility is no longer applicable given the selection of the Eastport site.

Changes to POS: None

Comment 11: Consider in the EIS the cost impact of Clay County's withdrawal altogether of service from JEA due to another utility serving the area. This would include addressing the possibility of transferring Clay Electric customers in Duval County onto JEA service and allowing Clay Electric to take over the customers in Clay County now on JEA.

Response 11: See Response 10.

Changes to POS: None

Comment 12: The EIS should include a detailed account of environmental impact on the entire St. Johns River, not just at the site selected. Particularly if the Clay County site selected is Willis Point, close to the Seminole plants in Putnam County. Plants within a few miles of each other will have a definite effect on the entire St. Johns River basin.

Response 12: With respect to surface water hydrology, the utilization of a closed cycle cooling system and the Northside Plant's discharge assures that the Eastport Plant impact will not be detectable except within the portion of the river being examined. From the standpoint of air emissions, we agree that the combined impacts of the various new sources need to be considered. However, we feel that the level of detail should be different for different areas of the region. The air quality analysis, as planned, will consider both local and regional impacts, and will include the expected impacts of both the existing and other planned (permitted) sources, in addition to the impacts from the JEA plant.

Changes to POS: Task 4.1.6, Page 4-9

State of Florida

DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee	
To: Bill Thomas	Loctn.: BAQM
To:	Loctn.:
To:	Loctn.:
From:	Date:

TO: Power Plant Siting Review Committee
FROM: Karen W. Anthony, Power Plant Siting Section
DATE: May 6, 1980

SUBJECT: Jacksonville Electric Authority "Plan of Study"

We have received a revised Plan of Study (POS) from JEA which generally describes the kinds of studies they will perform pursuant to submission of a Site Certification Application for their Easport site. We would appreciate your review and comment on the plan, as well as that of anyone else on your staff who has expertise in the areas the Plan and Application will cover.

Due to the limited number of POS copies given to us, we have copied those portions of the POS applicable to the various Committee member's area of expertise, as well as the Introduction and the Table of Contents proposal for the Application.

The Site Certification Application will address in detail what is just generally outlined in the POS. However, if we feel that certain topics which we feel need to be addressed seem to be omitted from their the study descriptions or from the outlined Table of Contents, we need to point the omission out at this time. In part due to a Memorandum of Understanding that this agency hopes to soon sign with EPA, we will entering into an agreement with applicants, in this case JEA, as to the scope and details of an Application. The JEA agreement will be worked out sometime in June as a result of comments received on the POS. We will still have some leeway as to determining the "sufficiency" of an application, but the scoping agreement will firmly define "completeness" unless the applicant revises his site plans prior to application submission. Therefore, if you note a lack in the plan as best can be ascertained from the general nature of the POS, please call it to our attention now. It may be helpful for you to compare the POS to your copy of the Department's Power Plant Site Certification Application Form, 17-1.122(72) FAC.

Please submit your comments to this Section by May 28th at the latest.

Distribution: Bill Thomas, Bureau of Air Quality
Scott McClelland & Steve Palmer, Water Quality Analysis
Larry Olsen, Biology
Rodney DeHan, Groundwater
Don Kell, Permitting

H6 - Rev 7/76

Bill Thomas

SITE CERTIFICATION APPLICATION
AND
ENVIRONMENTAL INFORMATION DOCUMENT

PLAN OF STUDY

2-600 MW COAL-FIRED PLANTS

1985 - 1987

Submitted to the
State of Florida Department of Environmental Regulation,
U.S. Environmental Protection Agency
and
Other Applicable Federal, State and Local Agencies

By the
Jacksonville Electric Authority
City of Jacksonville, Florida

April, 1980

PLAN OF STUDY

Table of Contents

1.0 GENERAL STUDY DESCRIPTION

1.1 INTRODUCTION

The Site Certification Application and Environmental Information Document (SCA/EID) - Plan of Study for a two 600 MWe unit coal-fired power plant, directly associated transmission lines, and other associated facilities has been prepared by Envirosphere Company, a division of Ebasco Services Incorporated, for the Jacksonville Electric Authority (JEA). It is being submitted to the State of Florida - Department of Environmental Regulation (DER), the U.S. Environmental Protection Agency - Region IV (EPA) and other appropriate local, state and federal regulatory agencies for final review and approval.

The structure and function of this Plan of Study are directed toward the following objectives.

- To encourage timely agency input to the licensing process;
- To generally describe the Project - Site, Plant, and directly associated facilities;
- To present an outline for the SCA/EID;
- To identify, describe, and organize the diverse activities required to gather, analyze, and report environmental information necessary for compliance with applicable regulations;
- To assist in the design of the electric generating facilities through the optimization of natural resource utilization;
- To establish the basis for the collection, interpretation and utilization of information;
- To define the Overall Project Schedule and the Environmental Licensing Milestone Schedule, and
- To introduce the Environmental Project Team.

The Plan of Study has been developed with the understanding that a single document, referred to as the SCA/EID, will satisfy the DER requirements under the Florida Electric Power Plant Siting Act, and EPA requirements under the National Environmental Policy Act.

1.2 PLAN OF STUDY

In developing the sections in this Plan of Study which detail the proposed outline for the SCA/EID (Section 3), Environmental Study Plans (Section 4), and the approach to the Need for Power (Section 5), Envirosphere considered information from the following specific regulations and guidelines:

- DER Guidelines for Application for Certification of Proposed Electric Power Generating Plant Site (DER Form 17-1.122(72) Jan, 1979)

- The Council on Environmental Quality Regulations on the National Environmental Policy Act (FR, Nov 29, 1978)

- EPA proposed regulations on the Implementation of Procedures on the National Environmental Policy Act (FR, June 18, 1979)

- Report to EPA on Environmental Impact Assessment Guidelines for New Source Fossil Fueled Steam Electric Generating Stations (Wapora, Inc., Dec., 1978)

The SCA/EID outline presented in Section 3 is reflective of both federal and state requirements. The inclusion of the SCA/EID Chapter 9, Plant Design Alternatives, is not a specific requirement of DER Form 17-1.122(72) but has been included primarily to satisfy federal review requirements and to generally provide information to the state.

The SCA/EID outline may require minor revisions as agency comments are received and as the study plans described in Sections 4 and 5 are implemented.

The Environmental Study Plans are organized by study discipline in the subsections 4.1 - 4.9. Each subsection is further organized by tasks to be accomplished. Each task is described through a presentation of the task "Objective", task "Approach", and task "Use of Results". The "Use of Results" sub-subsections reference other Environmental Study Plan tasks and/or specific sections of the SCA/EID.

The Need for Power Statement is organized into sections according to DER Form 17-1.122 (72). Each section is further subdivided so as to present the specific information anticipated to be presented under the Purpose of Proposed Facility and Associated Transmission, Chapter 1, of the SCA/EID.

For chapters/sections in the SCA/EID that are not specifically covered by the wording in Sections 4 and 5, the informational requirements of DER Form 17-1.122(72) will be utilized.

1.3 LICENSING PHASES

The Environmental licensing will consist of four phases as follows:

I - Environmental Mobilization

II - Field Investigations and Data Analysis

III - License Application Preparation

IV - License Application Support Activities

Phase I consists of planning for field investigations and data analyses and environmental evaluation of alternative plant conceptual designs.

Phase II consists of the performance of detailed environmental field programs and analytical study programs. It also includes activities pertaining to the determination of the environmental setting of the plant as a result of monitoring studies conducted for approximately one year.

Envirosphere will conduct a field monitoring program which meets the requirements of the various regulatory agencies. This program is described in Section 4.

Phase III will be performed concurrently with Phase II and consists of the actual preparation, review, finalization, and publication of the required local, state, and federal environmental license applications for the project.

Phase IV consists of support activities required to respond to questions of the regulatory agencies during the regulatory review stage and to provide testimony at public hearings.

1.4 PRIOR LICENSING ACTIVITIES

A Prevention of Significant Deterioration (PSD) Report was submitted to EPA in July, 1978. It is anticipated that the Report will be updated and resubmitted to EPA in May, 1980.

2.0 PROJECT DESCRIPTION

2.1 Site

The Eastport Site is located adjacent to the Northside Generating Station in Northern Duval County along the St. Johns River (Exhibit 2.1-1). The site was selected as the preferred site by the JEA in February, 1980 after extensive consideration of technical, environmental, socioeconomic, and economic factors relating to three candidate sites. (Walkill, Willis Point, Eastport). The Eastport Site consists of approximately 1500 acres.

Property on the south side of Blount Island adjacent to the deep water channel of the Dame Point Cutoff will be used for the development of a ocean vessel coal unloading facility. This area consists of approximately 50 acres.

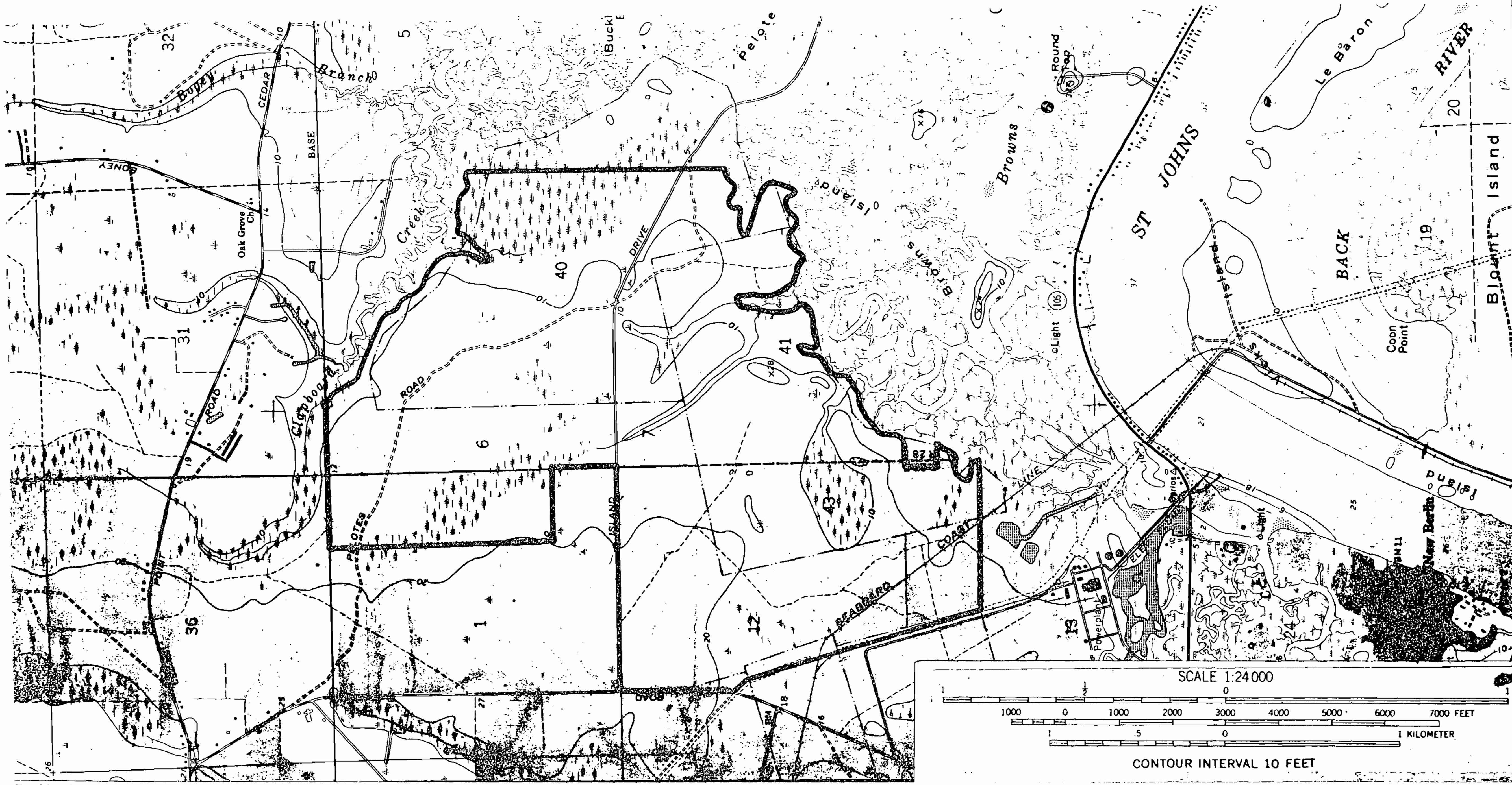
2.2 PLANT AND ASSOCIATED FACILITIES

The Plant and Associated Facilities consists of an installation with structures, systems and equipment consisting principally of two 600 MW class turbine-generator units and accessories, surface condenser and auxiliary equipment; two pulverized coal-fired, 2400 psig (nominal), $1000^{o}F/1000^{o}F$ (nominal), balanced draft steam generating units (of appropriate steam capacity to serve the turbine-generator) with accessories and auxiliary equipment; one 637 foot dual-flue chimney (this represents the "Good Engineering Practice" value calculated in accordance with EPA guidelines (USEPA, 1978a); particulate removal system; flue gas desulfurization (FGD) system; auxiliary boiler; feedwater heaters; boiler feed pumps; condensate pumps; water treatment and polishing demineralizing units; circulating water system including two atmospheric cooling towers, pumps and make-up facilities; central control room with boiler-turbine-generator control board; instrumentation; relaying and control systems; plant operations computer system; piping systems; main power and unit auxiliary transformers; main and auxiliary electrical systems; 230 kV switchyard; transmission facilities; station cathodic protection and grounding; lighting and communication systems; coal delivery unloading and handling facilities for ship, barge and train; dredged material spoil sites; flue gas desulfurization waste handling and storage facilities; ash disposal system; wastewater handling, treatment and disposal facilities; sewage handling and treatment facilities; miscellaneous facilities including plant water laboratories, shop, general warehouse and office; bridge cranes, hoists and monorails; utility and personnel elevators; substructures, foundations, buildings, structures and miscellaneous facilities; and other systems and auxiliaries for complete generating units within the context of the above.

boiler

natural draft

weak on transline description



EASTPORT SITE

EXHIBIT

2.1-1

3.0 SITE CERTIFICATION APPLICATION AND ENVIRONMENTAL INFORMATION DOCUMENT (SCA/EID)

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SCA/EID TABLE OF CONTENTS (Continued)

1. AIR QUALITY ANALYSES SHOULD INCLUDE NOT ONLY PSD BUT THE NONATTAINMENT AREA EMISSIONS.

SCA/EID TABLE OF CONTENTS (Continued)

SCA/EID TABLE OF CONTENTS (Continued)

UNDER FUELS THE PROJECTED FLUE GAS VOLUMES MUST BE DETERMINED.

1. AIR EMISSIONS FROM THE COOLING TOWERS AND THE FACILITIES FOR HANDLING COAL AND ASH MUST BE ADDRESSED
2. EMISSIONS OF NESHAPS POLLUTANTS AND FLUORIDES SHOULD BE ADDRESSED.

SCA/EID TABLE OF CONTENTS (Continued)

4. STACK AND FUEL HANDLING EMISSIONS SHOULD ALSO INCLUDE ASH HANDLING EMISSIONS
5. IMPACT OF STACK EMISSIONS ETC. ON NON ATTAINMENT AREAS,
6. QUALITATIVE ANALYSES IN ANY AIR POLLUTION AREA ARE NOT ACCEPTABLE AND MUST BE QUANTITATIVE,
7. ACID RAIN IMPACTS SHOULD BE ADDRESSED,

1. VISIBLE VAPOR PLUME ANALYSIS FOR COOLING TOWERS MUST FOGGING POTENTIAL
2. INFLUENCE OF PLUME ON QUANTITATIVE GENERATION OF SO4 USING DISPERSION PROGRAMS SPECIFICALLY DESIGNED FOR THIS PURPOSE
3. IMPACTS OF PARTICULATE MATTER FROM COOLING TOWERS IN CONJUNCTION WITH OTHER SOURCES ON PSD INCREMENTS & TSP NON ATTAINMENT AREAS

SCA/EID TABLE OF CONTENTS (Continued)

1. MONITORING OF AIR QUALITY MUST INCLUDE ALL POLLUTANTS CRITERIA (TSP, SO_x, NO_x, CO, C_xH_y, ETC.), NESHAPS (ASBESTOS, BERYLLIUM, MERCURY, ETC.), AND POSSIBLY FLUORIDES IN GRASS. ALSO SO_4 AND ACID RAIN.

SCA/EID TABLE OF CONTENTS (Continued)

* This Chapter is not a specific requirement of DER Form 17-1.122(72). It is included primarily to satisfy federal review requirements and to provide information to the state.

SCA/EID TABLE OF CONTENTS (Continued)

4.0 ENVIRONMENTAL STUDY PLANS

4.1 AIR QUALITY/METEOROLOGY

4.1.1 Literature Survey/Data Search

Introduction: Meteorological and air quality data should represent local conditions as closely as possible and should also indicate any important regional patterns which affect project impact beyond the local scale.

Objective: To collect and organize information available from public and private literature sources for use in characterizing:

- regional climatological conditions,
- onsite climatological conditions,
- meteorological conditions affecting plume dispersion,
- background ambient air quality conditions,
- existing major emission sources which may interact with the proposed project, and
- regulatory requirements.

Approach: Much of the information required for subsequent analysis is already on hand as a result of prior or current studies in Florida. Additional data will be obtained from the following sources and others as appropriate:

Meteorology

- National Climatic Center
- University libraries

Air Quality

- EPA
- DER
- Jacksonville Bio-Environmental Services
- Florida Sulfur Oxides Study

A.Q. MUST INCLUDE CURRENT DATA

- Florida Power & Light Company
- Seminole Electric Cooperative, Inc.

The type of information sought is that which is required to satisfy the data requirements of activities to be described subsequently. Briefly, the subjects for which literature material will be sought include:

Meteorology

- Mean and extreme values of temperature, precipitation, humidity, wind, atmospheric stability, plus summaries of air pollution episodes and severe storm occurrences.
- Joint frequencies of wind directions, wind speeds, and atmospheric stability.
- A detailed listing of hourly surface weather observations covering a five year period suitable for use in computerized dispersion modelling. Mixing depth values computed from radiosonde observations required for modelling will also be obtained.
- Precipitation acidity.

Air Quality

- Baseline ambient air quality data for the criteria pollutants from official monitoring stations in the area.
- Information on major emission sources (permitted pollutant emission rate, stack height, stack diameter, plume exit velocity, plume exit temperature, and date operation commenced) reflecting present and anticipated future operating conditions.
- Information on fugitive emissions from coal trains.
- Federal, state and local regulations.
- Information on acid rain formation and transport mechanisms and published studies on acid rain or trace element impacts due to sources similar to the proposed plant.

INCLUDE NESHAPS, ACID RAIN, FLUORIDES IN MONITORING / EMISSION WORK. COOLING TOWER EMISSIONS MUST BE INCLUDED COAL AND ASH HANDLING EMISSIONS MUST BE INCLUDED BASELINE PSD AND NON ATTAINMENT AREAS SHOULD BE QUANTITATIVELY EXAMINED.

Use of Results: Collected data will be organized to form a basis for descriptions of baseline meteorology and air quality, (Sections 2.6, Climatology, and 2.7, Air Quality of the SCA/EID) which will in turn, provide the basis for predicting project impacts. Some of the information will also be used in atmospheric dispersion modelling, described in Task 4.1.6, and in assessing compliance with applicable regulations.

4.1.2 Preapplication Monitoring Program

Introduction: A preapplication on-site meteorological/air quality monitoring program is required for purposes of state of Florida Power Plant Site Certification and is usually necessary as part of the Prevention of Significant Deterioration (PSD) approval process. The air quality data will be collected to establish baseline air quality. The meteorological data will be collected to: (1) determine the representativeness of long-term off-site data, (2) aid in the identification of the source of any existing high pollutant concentrations. (3) identify any site specific meteorological conditions important in pollutant dispersion, and (4) provide input to plant design.

Objective: To satisfy the preapplication monitoring requirements of FDER and EPA and to provide the necessary meteorological and air quality data for baseline determination, plant design, and impact assessment.

Approach: The approach that will be followed in the monitoring program is to comply with the requirements of EPA Report No. EPA-450/2-78-019 "Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)" and the EPA Quality Assurance Requirements in "Appendix B" of the May 10, 1979 Federal Register, as well as Envirosphere's "Meteorological and Air Quality Standard Operating Procedures (Draft)". These documents provide guidelines for monitoring site selection, instrument exposure, operating procedures, quality assurance, and data reporting.

The monitoring program will consist of the following activities:

- Development and approval of monitoring plan.
- Equipment selection, procurement, installation and checkout.

- Monitoring system operation and calibration.
- Data reduction and quality assurance
- Data reporting.

A monitoring plan will be prepared and submitted to the DER, EPA and other appropriate agencies for approval. The plan will consist of a network description, monitoring site description, equipment descriptions, a discussion of the sampling program procedures, a program duration, and a description of the quality assurance program that will be a part of the monitoring program. When?

The present design for the meteorological monitoring program calls for continuous measurement and recording of temperature, dewpoint (or relative humidity), and wind speed and direction at a height of ten meters above ground level at a single representative location. The system will be capable of determining the standard deviation of horizontal wind direction (sigma theta), which is useful for the determination of on-site atmospheric stability.

The on-site air quality monitoring program will consist of continuous monitoring and recording of SO_2, CO, O_3 and NO_x and once every third day sampling (coordinated with DER and Jacksonville Bio-Environmental Services (BES) sampling schedule) of TSP using reference or equivalent methods. Periodic analyses of the TSP why? filters will be made for lead (Pb). A single sampling station is planned at a representative location in the vicinity of the plant site; however, two Hi-Vols will be needed for TSP measurement to provide a precision check. O_3 will be monitored only during the April to October period.

A temperature controlled building will be used to house those parts of the meteorological and air quality instrument systems that do not require outside exposure. These include strip chart recorders, data logger, and related electronic equipment. The shelter temperature will be recorded by the data logger (hourly averages) and by a max-min thermometer. The two Hi-Vol samplers will be mounted on construction scaffolds.

The meteorological and air quality equipment specifications will be such that they satisfy the requirements of the EPA monitoring guidelines.

The meteorological data and the air quality data (except TSP) will be recorded on analog strip charts and simultaneously processed for digital recording on magnetic tape. TSP data will be summarized manually.

SO_2, SO_4, ETC. MUST BE INCLUDED WITH ALL OTHER CRITERIA & NESHAPS POLLUTANTS.

In accordance with our "Standard Operating Procedures", all continuous air quality analyzers will be automatically zeroed and spanned daily and running control charts of these levels will be maintained and observed by the station operator for correct analyzer operation. The station will be visited at least three times per week by the station operator. A determination of analyzer precision will be made from the daily zero and span values. The analyzers will be calibrated monthly and whenever any major maintenance has been performed. TSP samplers will be calibrated on a quarterly basis. Quarterly quality assurance audits by an independent consultant or agency will be conducted.

The meteorological monitoring system will also be checked during each air quality station visit by the station operator. Items checked will include verification of wind direction, wind speed, temperature, dewpoint and sigma theta for reasonable values. At least once per week, measurements of dry and wet bulb temperature will be made using a motor aspirated thermometer for verification of temperature and dewpoint measurements.

Magnetic tapes and strip chart recordings will be removed and replaced on a monthly basis during the scheduled calibration. They will be sent via a secure method to Envirosphere's offices for processing. Hi-Vol filters to be analyzed gravimetrically will also be sent to Envirosphere's office. Filters requiring special analyses will be sent to an independent laboratory for further testing.

Data will be processed, quality assured, and analyzed to produce appropriate statistical summaries for the averaging periods of interest for each pollutant and meteorological variable. Envirosphere's data analysis programs will be used to produce listings, frequency distributions, wind roses, means and extremes as appropriate.

<u>Use of Results:</u> The collected data will be used in Section 2.6.2, Onsite Conditions, and 2.7.2, Background, of the SCA/EID; as input to the plant design criteria; and to identify any unusual site-specific conditions which require a special treatment in either plant design or impact assessment methodology. A description of the program will be included as part of Section 6.2 of the SCA/EID.

4.1.3 Description of Baseline Climate/Air Quality

Objective: To document the climatological and air quality conditions in the site area and thereby satisfy the reporting requirements of DER Site Certification Application Guidelines and EPA Environmental Impact Assessment Guidelines.

Approach: Based on historical records amassed by official observation stations, the data developed by the on-site monitoring program (Task 4.1.2), and appropriate regulations, the following items will be presented.

- Qualitative description of general climate patterns.
- Quantitative statistical summaries (mean and extremes) of temperature, humidity, wind direction, wind speed, atmospheric stability, and rainfall for the site and surrounding area.
- Frequency of occurrence of severe weather (hurricanes, tornadoes, damaging winds, extreme precipitation).
- Description of dispersion conditions, mixing depth, regional wind flow, and stagnation episodes providing the potential for pollutant accumulation.
- Description of existing concentrations for the criteria pollutants: SO_2, TSP, O_3, CO, NO_2, Pb, and other regulated pollutants as appropriate.
- Ambient air quality standards, regulations, and emission control requirements.
- Air Quality Control Region (AQCR) classification, distance to nearest locations which are or are likely to become PSD Class I areas, and distance to nonattainment areas.
- Description of primary emission sources within 50 km of the site with which the proposed project is most likely to interact (with emphasis on point sources).
- Description of existing precipitation acidity, if available.

Use of Results: Data summaries obtained will be incorporated into Section 2.6, Climatology, and 2.7, Air Quality, of the SCA/EID and also disseminated to investigators in other disciplines as needed. Some of the information obtained will also be used during the disperions modelling activities associated with air quality impact analysis.

NON ATTAINMENT AREA IMPACTS MUST BE QUANTITATIVELY ASSESSED.

EXISTING ACIDITY MUST BE DETERMINED

4.1.4 <u>Description of Plant Air Quality Control Systems</u>

<u>Objective:</u> To discuss the project features related to air emissions and demonstrate compliance with applicable emission standards and control technology requirements.

<u>Approach:</u> The following items will be developed and presented:

- Fuel characteristics - type, heating value, sulfur content, ash content, consumption rate, etc.

- List of emission sources with source characteristic included - pollutant emission rates, stack height, stack diameter, exit temperature, and exit velocity.

- Applicable New Source Performance Standards (NSPS) and demonstration of compliance with standards.

- Applicable Best Available Control Technology (BACT) requirements and demonstration of compliance. Economic, energy, and environmental factors are involved in this demonstration and other disciplines (besides air quality) will provide input as necessary. A BACT demonstration has already been made in support of the PSD application submitted to EPA Region IV in July, 1978. However, it is expected that additional work in this area will be required because of regulatory and design changes which have occurred since that time.

- Pollution control equipment specifications (preliminary design).

<u>Use of Results:</u> Results will be used as model input for impact assessment, as a demonstration of the utilization of BACT (as part of the revised PSD application), and as input to Section 3.8 (Air Emissions) of the SCA/EID.

4.1.5 <u>Assessment of Impact of Plant Construction</u>

<u>Objective:</u> To provide an assessment of possible air quality impacts created during the project construction phase and a description of techniques planned to minimize impacts.

BACTS MUST INCLUDE COOLING TOWERS.

Approach: The air quality impact of construction activities is difficult to assess quantitatively. However, a qualitative discussion will be provided of the potential for fugitive dust emissions during site grading operations. If open burning of land clearing debris is planned during the construction phase, the air quality impact of this action will be discussed. Vehicular emissions due to construction vehicles will be estimated and their significance discussed if sufficient information on construction vehicle activities is available. Control technology to be used, particularly in the suppression of fugitive dust, will be described.

Use of Results: Results will be included in Section 4.1.3.2 (Air Quality) of the SCA/EID.

4.1.6 Assessment of Air Quality Impacts of Plant Operation

Objective: To define the probable air quality impacts which will occur during the operation phase of the proposed project. Impacts on existing concentrations of the criteria pollutants (with emphasis on SO_2, TSP, and NO_2) and sulfates will be predicted and compared with applicable ambient standards and PSD increments. A qualitative assessment of the impacts of plant operation on visibility, acid rain, and trace element concentrations in the environment due to coal combustion will also be made.

Approach: Air quality impact evaluations related to project operation will include:

- Performance of single source modelling to evaluate 3-hour, 24-hour, and annual average concentrations of specific pollutants resulting from project emissions.

- Analysis of the interaction of stack and cooling tower plumes, based on geometrical considerations.

- As needed, performance of multiple-source modelling to evaluate interactions with other emission sources.

- Modelling of particulate concentrations from coal handling system, ship unloading facility, and other sources of fugitive dust. Limestone handling, etc.

IMPACTS OF COOLING TOWERS ON AMBIENT CONCENTRATIONS MUST BE INCLUDED. ALL PROJECTIONS AND IMPACT ASSESSMENTS MUST BE QUANTITATIVE AND NOT QUALITATIVE. IMPACTS ON NONATTAINMENT AREAS MUST BE INCLUDED.

Assessment of modelling results combined with existing air quality data in terms of compliance with ambient air quality standards and PSD Class I and Class II increments, and effect on nearest non-attainment areas. Both local and regional impacts will be considered.

- Assessment of pollutant concentrations under accidental emission conditions.

- Analysis of expected sulfate concentrations (short-term and long term), based on a simple time dependent sulfur dioxide to sulfate conversion mechanism. Concentrations due to the proposed plant alone and in combination with other existing and planned sources will be estimated.

- A qualitative assessment of expected visibility impacts in the area of the Okefenokee Wildlife Refuge/Wilderness Area (the only Class I PSD area within 100 km of the proposed plant). This assessment will be based on expected short-term and long-term increases in particulate concentrations in the Okefenokee area and anticipated visibility reductions due to particulates alone. This will be combined with estimates of the amount of time per year that the plume will be carried to the area by the winds. However, no attempt will be made to make use of any of the sophisticated models available to analyze the impact of the plume on any particular viewshed because these models have not been properly validated, particularly for the southeast.

- A qualitative assessment of acid rain impacts will be made based on a literature search for information on acid rain formation, transport, and impacts due to similar facilities. In coordination with the water quality and ecology disciplines, a discussion will be developed which identifies in a qualitative sense any acid rain impacts that might be expected due to operation of the plant in combination with other existing and proposed facilities in the area. This discussion, which will become part of Section 5.3.5 of the SCA/EID (but which will not be included in the PSD Report), will attempt to relate the magnitude of expected changes in air pollutant emissions in Jacksonville to emission changes which have produced acid rain impacts, assuming such information is available. The discussion will also include an assessment of the results of any of the ongoing research programs on acid rain which become available by the fall of 1980.

ACID RAIN IMPACT ASSESSMENT MUST BE QUANTITATIVE ESPECIALLY ON HISTORICAL MONUMENTS & CROPS.

- A qualitative assessment of trace element impacts from the proposed plant will be developed upon a data base derived from a literature survey. This survey will focus on published studies (if available) conducted at operating coal-fired generating facilites which provide information on trace element inputs from the coal (based on a regional coal analysis, if available) trace element distribution into combustion by-products, and plant and air quality control system design. The assessment of the ecological implications of trace element release is discussed in Section 4.5 of this Plan of Study.

TRACE ELEMENT IMPACTS MUST BE QUANTITATIVE.

The primary analytical tools which will be used in the air quality impact evaluations are EPA approved atmospheric dispersion models. It is expected that Envirosphere's version of the EPA CRSTER model will be the principal dispersion model utilized. CRSTER is the EPA model recommended for use where there are no significant meteorological or terrain complexities. It is a straight-line, steady-state model which incorporates Gaussian diffusion concepts. It calculates ground-level concentrations for each receptor point for each hour of the year using hourly values of surface and upper air meteorological variables. The wind speed input is adjusted to speeds representative of the stack height where emissions first enter the atmosphere by application of stability-dependent power law relationship. The Briggs final plume rise formulae are used to calculate plume behavior. The vertical and horizontal dispersion coefficients are derived from Turner for seven atmospheric stability classes. The top of the mixing layer is treated as a reflecting boundary of the plume until, at some distance downwind, the surface layer is assumed to be uniformly mixed.

The version of CRSTER which will be used for this analysis differs from the standard EPA version in two important respects. First, it allows the consideration of multiple sources. Second, in keeping with current EPA Region IV practice, it allows for the calculation of "running" or overlapping three-hour averages.

The computer program produces tables of annual average concentrations predicted for each input receptor point as well as tables of the highest and second-highest concentrations for each receptor point for the 24-hour, 3-hour, and 1-hour averaging times. The second-highest ground-level concentrations during a given year of data are of prime importance because the short-term ambient standards and PSD increments are defined by values that are not to be exceeded more than once per year. It should be noted that the "highest, second-highest" concentration, which is used to demonstrate compliance, is the concentration at the receptor grid point at which the calculated second-highest value (over a given year) exceeds the second-highest values at all other receptor points. Again, in keeping with current EPA Region IV practice, even though three-hour averages are computed as "running" averages, all hours included in the highest three-hour average for a particular point are excluded from inclusion in the "highest, second-highest" three-hour average for that point, i.e., a separate three-hour episode is used.

Should the use of CRSTER not be feasible or appropriate, Envirosphere's AQUAL model will be used to predict plant impacts. AQUAL is also a steady-state Gaussian plume model applicable to single or multiple source configurations in even or uneven terrain. The model computes one-hour concentrations for the period of interest and has the option of storing the calculated concentrations on magnetic tape for statistical processing or computing 3- or 24-hour running averages for comparison with standards. It is similar to CRSTER in many important respects, but allows more flexibility in receptor location specification, plume rise computation, chemical transformation of pollutants, and output presentation. The AQUAL model has been accepted for use in PSD applications by several EPA regions including Region IV.

For the detailed analysis of worst-case 24-hour and 3-hour periods identified by either CRSTER or AQUAL, a US EPA short-term model entitled PTMTP is expected to be used. Program PTMTP calculates ground-level concentrations in a manner similar to CRSTER, but is able to analyze any number of sources and receptor grid points. This program calculates values using a certain receptor grid and can easily be used to analyze very dense receptor fields so that maximum ground level concentrations may be identified.

1. NON ATTAINMENT IMPACT MUST BE DETERMINED
2. RUNNING AVERAGE TECHNIQUE MAY BE QUESTIONNABLE. CHECK L. GEORGE.
3. MODELS OTHER THAN EPA MUST BE FULLY DOCUMENTED.

Whichever model is used, the meteorological input data will consist of five years of surface and upper air data which are representative of on-site conditions. These data will be collected in Task 4.1.1. The surface data required for model input will consist of hourly observations of wind speed and wind direction (to the nearest ten degrees), temperature, cloud cover and ceiling height. The upper air data will consist of twice daily mixing heights computed from rawinsonde data from the nearest upper air station (Waycross, Georgia in this case). The detailed air quality analysis will be based on the "worst-case" year of this five year data base.

If modelling at distances of greater than about 30 km is necessary to determine the impacts of the plant on a Class I area, then alternatives to the steady-state, Gaussian approach will be explored to give approximations.

Some air quality impact modelling has already been performed in support of a PSD application submitted to EPA Region IV in July, 1978. However, since regulatory requirements and plant parameters have changed since that time, it is anticipated that additional modelling will be necessary.

Use of Results: The predicted air quality impacts and the determinations of compliance with standards will be used in Section 5.3 of the SCA/EID and a revised PSD application.

4.1.7 Assessment of Cooling System Impacts

Introduction: In the event that closed cycle cooling is selected, the location, orientation and type of cooling towers or other cooling systems recommended for use by the plant will be determined as part of in-support-of-engineering studies to be conducted. The effects of cooling system operation will need to be predicted as part of the overall environmental assessment.

Objective: To predict the extent of fogging, visible vapor plumes, air quality impacts of particulates, and drift deposition due to cooling system operation.

Approach: The approach will be two phased:

- Using cooling system design parameters identified by Ebasco, develop estimates of fogging, visible vapor plumes, pollutant transformation due to interaction with the stack plume, and particulate and drift deposition in the vicinity of the plant, with particular emphasis on important receptor areas for the preferred cooling system options.

- In conjunction with the engineering staff, recommendations will be made concerning the cooling system locations, type and orientation using preliminary specifications of water consumption, cycles of concentration, temperature, etc. The analysis will consider the potential for environmental effects in areas of important receptors (highways, the St. John`s River, population centers, areas of sensitive vegetation, and sensitive portions of the plant complex) identified in the first phase as well as the orientation or cooling towers with respect to the boiler stack so as to minimize plume interactions.

Envirosphere`s cooling tower impact models, GRDFOG, PLUME, and DRIFT are expected to be the primary analytical tools utilized in the prediction of cooling tower impacts. These computer models will use representative meteorological data (winds, atmospheric stability, and humidity parameters such as saturation deficit) identified in Task 4.1.1.

Use of Results: The results of the cooling system location, type, and orientation recommendations will be used in Section 3.4 of the SCA/EID which describes the plant features. The predicted effects of cooling system operation will be used in Section 5.4 of the SCA/EID concerning plant operational effects and will be provided as input to the ecologists for use in determining impacts on the biota.

4.1.8 Evaluation of Environmental Aspects of Plant Design, Fuel, and Site Alternatives

Objective: The objective of this activity is to evaluate the air quality effects of feasible alternatives in plant design features and fuel use as well as alternative plant sites. Emphasis will be on those features actually considered as viable alternatives from economic and engineering standpoints.

COOLING TOWER IMPACT ASSESSMENTS MUST BE QUANTITATIVE TO BE ACCEPTABLE.

Approach: The following items will be included:

- Discussion of the different emission characteristics resulting from use of alternative emission control systems and/or alternative control levels evaluated in the determination of BACT. Brief evaluation of the effects which these differences might have on ambient concentrations will be made by reference to the available modelling analyses conducted as part of Task 4.1.6. The effects on other environmental components will be evaluated by the investigators in other disciplines.

- Analysis of the stack height required to comply with the "Good Engineering Practice" stack height regulations.

- Evaluation of the effects of alternative plant cooling systems.

- Evaluation of the air quality impacts of the use of alternative sites with different existing air quality and/or proximity to Class I (PSD) or nonattainment areas.

The atmospheric dispersion models needed will be the same as those described in Tasks 4.1.6 and 4.1.7; the meteorological, air quality and emission data needed will be identified as part of Task 4.1.1.

Use of Results: Results will be incorporated into Sections 8.2 and 8.3 SCA/EID discussing the effects of project alternatives as well as Sections 9.1 and 9.4, dealing with design alternatives. Some of this information will be included in a revised PSD application.

4.1.9 Development of Future Air Quality Monitoring Programs

Objectives: The objective of this activity is to develop a conceptual description of proposed operational air quality monitoring which may be instituted to record emissions and ambient concentrations.

Approach: The stack monitoring will be developed in accordance with applicable local, state and federal regulations. A recommendation as to the need for and scope of an ambient air quality measurement network will be developed based on discussion with regulatory agencies. The need for a meteorological monitoring station to supplement the air quality program and to provide information for plant operation will be assessed and an appropriate program recommended.

1. Impacts on Nonattainment Areas Must Be Analyzed

Use of Results: Results will be used in preparation of Section 6.3., Construction and Operational Monitoring of the SCA/EID.

4.1.10 Report Preparation

Objective: Document the results of the literature survey/data search, field monitoring program, data analysis, impact assessment, and analysis of alternatives in appropriate sections of the licensing documents.

Approach: The results of the other air quality tasks described in the Plan of Study will be summarized in a clear and concise manner in the format required by the licensing agencies. Assumptions, methodologies, input data and results will be presented and the rationale or basis for design decisions will be discussed. Appropriate use will be made of diagrams, pictures, maps, and tables. Presentation of material not relevant to the licensing decisions will be avoided.

Use of Results: The report sections prepared will be designed to satisfy the requirements of the Florida Electric Power Plant Siting Act and the National Environmental Policy Act (NEPA). They will also serve as the basis for the revised PSD Application.

Impacts on ~~PSD~~ NON ATTAINMENT AREA
DEFINE & PROJECT A.Q. IN NON ATTAINMENT AREA.

the previous meeting. It was also determined that the Committee would vote as a body rather than each member making his own recommendation. The rankings will be made on a one to three scale with three being the best and one the worst.

Using this system, motions were made and seconded as follows:

> For compatibility with existing land use and zoning, Eastport and Willis Point were ranked equally with three's and Walkill was ranked two.
>
> For regulatory agency opinion, Willis Point was ranked three, Walkill was ranked two and Eastport one.

Both motions passed the Committee.

The next item on the agenda was presentations on the air quality at each of the three sites.

Mr. Douglas Fulle of Ebasco gave a presentation describing the air quality at Willis Point and Walkill. Mr. Fulle's presentation included a discussion of emission control techniques, regulatory agency requirements, air quality licensing activities to date, and a summary of the results of air quality modeling performed on Willis Point and Walkill which predict the impacts of the proposed plant.

Mr. Fulle described typical control equipment used to reduce the pollutant emissions from a powerplant. The Flue Gas Desulfurization (FGD) System (scrubber) removes sulfur oxides from stack gasses. Particulate matter is removed from the stack gasses by an electrostatic precipitator or a bag house. Proper boiler design will minimize production of nitrous oxides, carbon monoxide, and hydrocarbons.

Fugitive dust emissions can occur from other plant operations specifically the following:

coal unloading
coal piles
coal conveying
coal crushing
coal trains

Mr. Fulle stated that there are measures to effectively control these fugitive dust emissions from the plant. Mr. Fulle went on to discuss coal trains as a separate item. He stated there are some particulate emissions from coal trains. However, conversations with the EPA have indicated that by the time the coal trains had traveled several hundreds of miles from the mine or coal preparation plant to the Jacksonville area, the emission would not be significant. Also, based on a preliminary literature search by Ebasco, no references could be found which state emissions from coal trains are a problem. Mr. Fulle stated that the coal trains would not have any more significant air quality impact than a normal freight train. He also said that an extensive literature search would be conducted and additional information sought to further determine the impact of coal trains.

Another fugitive emission from the plant can come from lime or limestone handling. To reduce this emission, the lime or limestone could be enclosed in a silo.

Ash handling can cause fugitive emissions. These emissions could be eliminated by mixing the ash with the FGD sludge.

Fugitive emissions from plant construction could be minimized by water spraying dirt roads and paving all permanent roads as early as possible.

Mr. Fulle next discussed the regulatory air quality requirements. There are four levels of regulation. These are as follows:

1. Emission standards limit what can be emitted from the stack.

2. Ambient air quality standards limit the level of ambient air pollutants at ground level.

3. Prevention of Significant Deterioration (PSD) requirements limit the degree of which a new source can effect the air quality of an area.

4. Ambient air quality monitoring is required to determine conditions before construction and operation and insure the standards are not being violated.

The specific regulations which govern stack emissions are the New Source Performance Standards (NSPS) which limit emissions as follows:

sulfur dioxide	.6-1.2 lbs/MMBtu	70-90% removal
particulate	.03 lbs/MMBtu	99% removal
oxides of nitrogen	.6 lbs/MMBtu	

It is expected that JEA will be required to remove 90% of the sulfur, based on the quality of coal currently being investigated.

The PSD regulations have been revised and new revisions are expected. These regulations have two requirements, one is for the utilization of Best Available Control Technology (BACT) for the air pollution control equipment and the other limits the maximum level of ambient air quality impact. The amount of impact varies depending on the class (i.e. Class I, II or III). Class I has the most stringent requirements, and Class III the least stringent. At present, most of the country is designated Class II. However, the Okefenokee Wilderness Preserve, located approximately 40 miles northeast of Jacksonville, is designated as Class I. At present there are no Clase III areas designated in the country.

The BACT emission control determination is made on an individual basis for every plant. This determination must take into consideration energy, economics, and environmental impact. However, the emission levels associated with BACT must be at least as stringent as the NSPS.

Where ambient air pollution concentrations are found to exceed the standard, more stringent requirements are set. These are called non-attainment areas and only very small impacts are permitted. If an impact greater than this is predicted, pollution offsets are required so that the total impact is a net decrease in pollution. There are no non-attainment areas near the Willis Point and Walkill sites but there is one in downtown Jacksonville for particulates and all of Duval County is non-attainment for ozone.

A PSD application was submitted to the EPA by the JEA for the Willis Point and Walkill sites. The PSD was submitted in 1978 and deemed complete by EPA. Subsequent to that, EPA requested additional engineering data. Finally EPA determined that the application was not complete because application for two sites was made and a final preferred site was not selected within a reasonable time. EPA stated they could only consider issuing a PSD application for a single site. A revised PSD application would need to be submitted for Willis Point or Walkill if either site is selected as the preferred site. As part of the revised application, an updated emission inventory of other sources would need to be collected and revised plant emissions determined. Also, air quality data for the site will be collected and a new air quality impact analysis completed which will include a study of additional issues raised by local citizenry. These are as follows:

effects on local agriculture
visibility effects
impact on St. Augustine Historical Area
acid precipitation

A question was asked whether visibility was the same as opacity. Mr. Fulle explained that visibility refers to the ability to see objects at a distance and opacity as referenced is the ability to see through a stack plume.

Mr. Fulle then gave a brief description of air modeling. Modeling is used to predict the ground level concentration of pollutants from a source using mathematical equations.

The modeling used for the PSD application was based on emission rates that were expected to be promulgated as part of the NSPS. The expected NSPS emission regulations were not as stringent as those finally promulgated. Therefore, it is expected that the impact on the plant will be even less than determined by modeling done for the 1978 PSD application.

The results of the modeling showed that the maximum PSD increment consumption would be approximately 1 kilometer from the plant and consume approximately 80% of the allowable increment. The impact on the Class I Okefenokee Wildlife Refuge was well below that allowed. The impact on the non-attainment area in Jacksonville was also below the significance level allowed. The combined impact between the proposed Seminole coal-fired powerplant and the proposed JEA plant were also shown to be within allowed levels.

Mr. Fulle, at this point, concluded his presentation and entertained questions. A statement was made by a member of the audience questioning the statements Mr. Fulle made about the particulate impact of coal trains. Mr. Fulle reiterated what he had previously stated and said that Ebasco would conduct a detailed literature survey and contact manufacturers of coal cars and other appropriate parties for information.

Another question was asked about sulfuric acid emissions. Mr. Fulle answered this by stating that sulfuric acid would not be emitted directly from the stacks. Sulfur oxide gas, however, is emitted which can be converted to sulfates and perhaps eventually to sulfuric acid in the presence of rain water. The sulfur removal efficiency required by BACT and NSPS were also questioned as to their achievability. Mr. Fulle answered this by stating that pollution control technology is advancing rapidly and that these efficiencies are achievable today although they weren't a few years ago.

Another question was raised, this one asking if the statement that the impact of the plant upon air quality would be less, included sources in the emission inventory such as the Seminole plant. Mr. Fulle stated that the total impact of the two plants would be less because the current NSPS requires more stringent emission controls than those previously evaluated. Another question was asked whether this plant would use "tall stacks". Mr. Fulle stated that EPA has abandoned the tall stack policy and now has regulations governing stack heights.

Mr. George Lipka of United Engineers & Constructors (UE&C) spoke next about air quality at the Eastport site. UE&C was the consultant to JEA who performed JEA's Site Selection Studies. Mr. Lipka stated that air quality has been a major concern at the Eastport site. In particular, there are three areas of primary concern.

1. Compliance with ambient SO_2 standards when added to the impact from JEA's Kennedy and Southside stations.

2. Compliance with ambient SO_2 standards when added to other sources.

3. Compliance with allowable PSD increments for the Class I Okefenokee PSD area.

Other issues were identified which were determined to have a low probability of impacting licensing of this site.

Modeling studies had determined that interactions between the proposed plant at Eastport and the existing JEA stations would exceed ambient sulfur oxide standards. The standards were exceeded primarily because of aerodynamic downwash at the Kennedy and Southside stations. Monitoring data near these stations indicated violations due to downwash.

Aerodynamic downwash occurs when the stack is not tall enough to clear the eddies caused by the wind flowing across the building. This tends to bring the plume down to ground level very close to the plant with limited dispersion.

UE&C looked at three methods to eliminate the predicted violations. These were the installation of scrubbers, use of very low sulfur fuel, or to raise the stacks to eliminate downwash. An evaluation was performed for each alternative and it was determined that the most cost effective solution would be to raise the stacks to the height suggested by EPA according to the recent stack height guidelines.

Modeling was done to determine if the interaction between the proposed JEA coal-fired plant at Eastport would violate the standards when interacting with the existing JEA system with new taller stacks. The results of this analysis showed that no violations of ambient standards would occur.

The interaction between the proposed JEA coal-fired unit and other emission sources in the area also indicated violations. Modeling done on these sources also included the effects of downwash which was primarily responsible for the violations. However, based on recent conversations with EPA, they have stated that modeling for these sources is not appropriate if actual monitoring data has not indicated violations.

Mr. Lipka recommended that additional modeling be done as per EPA guidance to determine the air quality impact of the interaction with other sources in the Jacksonville area.

The third major concern is the impact of the proposed coal-fired units at Eastport on the Class I PSD area. The previous modeling done by UE&C predicted violations of the allowable air quality increments. In the previous UE&C report, two recommendations were made. The first was the JEA could attempt to obtain a waiver from the land manager or governor of that state. In this case, it appears permission would have to come from both the governor of Georgia and Florida. The other recommendation was to reduce sulfur oxide emissions from the plant. This would require "state of the art" sulfur removal equipment. The reliability and efficiency of which would be uncertain.

In conversations with EPA subsequent to the UE&C study, suggestions have been made by EPA which update the emission rate assumptions made in the initial study. Also, EPA has suggested the use of certain recently developed long range transport models because the distance from Eastport to the Okefenokee Wildlife Refuge is greater than 50 kilometers. The standard models are not very applicable for distances greater than 50 kilometers. UE&C recommended that additional modeling be done using the suggestions made by EPA.

Mr. Lipka then reviewed other issues that were determined not to have a high probability of impacting the licensing of this site. These were as follows:

1. The combined impact of the proposed coal-fired plants with the Northside Station was shown to be within the limitations.

2. Increment consumption in the site vicinity could affect some industries from siting in this area.

3. The impact of particulate emissions on the Jacksonville particulate non-attainment area was determined not to be significant.

4. A short-term NO_2 standard has been pending with EPA for some time. This is a speculative issue and its impact cannot be determined.

Mr. Lipka concluded his presentation and entertained several questions.

The height of the new stacks at Kennedy and Southside was asked. Mr. Lipka said that the modeling they did used a height of 275 feet. This is approximately the Good Engineering Practice Height as required by EPA. The present heights of the stacks are approximately 130-140 feet tall.

Mr. Lipka was then asked how he would rank these sites based on air quality. Mr. Lipka stated he thought the Clay County sites were more favorable based on air quality.

It was then requested that Mr. Fulle rank Walkill and Willis Point based on air quality. Mr. Fulle stated he would rank these sites equal. Mr. Fulle then was asked how he would rank Eastport to the Clay County sites. He rated Eastport worse than the Clay County sites. A recommendation was made that the impact of the proposed coal-fired plants in Clay County on the St. Augustine historical district also be determined.

A motion was made that additional studies be undertaken and was seconded. The additional studies would include more site specific modeling to determine the impact on the proposed plant at Eastport on the Class I area. Also, the impact of the proposed plant at Eastport, when added to present emission sources of sulfur oxides in Jacksonville, modeling would be done to determine the impact on the St. Augustine historical area if the plant is sited in Clay County. This motion was passed by the Committee.

A statement was made by Sandra Shuler, a citizen from St. Johns County, concerning the St. Augustine historical area. She was not as concerned with air quality impacts in St. Augustine, as with the problem of acid formation and how this acid will impact the historical monuments in St. Augustine. She requested that a study be done to determine the corrosive impact of acid on these monuments. It was stated by Richard Breitmoser of the JEA that JEA will need to address this issue at some point because of the concerns being expressed.

Arthur Taylor, a resident on the Northside of Jacksonville, expressed concern that this proposed powerplant along with other industrial sources of pollutants there could make living in this area unpleasant. He wanted to let the Committee know that there was concern and opposition to the plant in the Northside.

The meeting was concluded shortly thereafter.

Mr. Breitmoser then introduced George Lipka of United Engineers and Constructors (UE&C), consultants to JEA on the site selection. Mr. Lipka was to present the results of specific studies which the Committee had requested during the November 30, 1979 meeting. The study was to investigate the following issues:

1. The impact of SO_2 emissions from the coal-fired plants at Eastport on the Okefenokee Class I area using more realistic plant emission rates than in the previous studies and a long range transport model.

2. Determine the total SO_2 impact on the Jacksonville area using a multi-source model to determine the cumulative impact from all SO_2 emitting sources in the vicinity of Jacksonville including the new coal-fired plants at Eastport.

3. Determine the particulate impact on the Jacksonville particulate non-attainment area from the coal-fired plant's stack and fugitive dust emissions, with the plant located at Eastport.

4. Determine the corrosive impact upon the St. Augustine Historical District if the coal-fired plant is located at either Willis Point or Walkill.

Mr. Lipka first reviewed the impact of the coal-fired units at Eastport on the Okefenokee Wilderness Area. Mr. Lipka stated that in conversations with the Environmental Protection Agency (EPA), they stated that it is now considered appropriate to use the emission rate calculated from the worst case sulfur content and 90% SO_2 removal efficiency. The EPA also stated that the use of a long range transport model more sophisticated than the standard CRSTER model could be used. UE&C selected a long range transport model named IMPACT to use for this case. UE&C then used the revised emission rate in both the IMPACT and CRSTER models. Results were obtained from both model's runs and UE&C determined that the conclusions drawn for each of the results were similar. Because of this, it was determined that the standard CRSTER model would continue to be used.

The results of the CRSTER model using the revised emission rate ~~and a SO_2 deposition rate (approved by EPA)~~ calculated results just within the standard. The 3-hour SO_2 concentration was 20.9 ug/m^3 with 25 ug/m^3 allowed. The 24-hour SO_2 concentration was 5.0 ug/m^3 with 5.0 ug/m^3 allowed.

Annual – ?

The multi-source SO_2 impact in the Jacksonville area was estimated using the multi-source CRSTER model. Emission rates for sources within the area were provided by the City's Bio-Environmental Services Division (BESD). These existing sources, the new coal-fired powerplants and a background SO_2 concentration as estimated by the BESD, were used in the multi-source CRSTER model.

The results of the model run showed one violation of the ambient SO_2 air quality standard. The violation was a 3-hour SO_2 concentration of 1317 ug/m^3 (1300 ug/m^3 allowed) predicted to occur on Dames Point. This is only slightly above the standard and would require only a small decrease in the SO_2 emission rate from either the coal plants at Eastport or the Northside plants.

The impact on the Jacksonville particulate non-attainment area was predicted using the CRSTER model. Both the emissions from the coal plant's stack and fugitive dust sources were used in the model. The results predicted a maximum 3-hour concentration of 4.3 ug/m3 (5.0 ug/m^3 allowed). However, EPA has indicated that particulate emissions from saltwater cooling towers may also be required when determining particulate impact. EPA has not adopted regulations requiring this, but if it is required, it is not known whether adding the cooling tower impact to the total impact will exceed the 5.0 ug/m^3 allowable.

UE&C also investigated the potential impact of SO_2 emissions from the coal-fired powerplants if located at Willis Point or Walkill on the Coquina rock structures in the St. Augustine Historical District. The analysis conducted by UE&C estimated the deterioration of the coquina rock to be less than 0.01 inches over the life of the plant. This impact is considered to be negligable.

Mr. Lipka concluded his presentation by stating that each of the three issues UE&C investigated for the Eastport Site gave results that just meets or slightly exceeds air pollution standards. These results do not preclude licensing of the site, however, they do not provide any margin for changing regulations. Mr. Lipka also stated that no additional pollution control equipment will be required at Eastport than will be required for Willis Point or Walkill.

Carolyn Lavender asked Mr. Lipka if the combined impact of the JEA and Seminole plants upon the St. Augustine Historical District would cause a combined impact greater than the individual impacts added together. Mr. Lipka stated that it would be rare if the plumes from both plants would impact St. Augustine simultaneously. Because of this, he did not predict significantly greater impact.

DEPARTMENT OF HEALTH, WELFARE
& BIO-ENVIRONMENTAL SERVICES
Bio-Environmental Services Division
Air and Water Pollution Control

CITY OF JACKSONVILLE, FLORIDA ®

May 30, 1984

Mr. Robert King
Central Air Permitting Section
Bureau of Air Quality Management
Dept. of Environmental Regulation
2600 Blairstone Road
Tallahassee, Florida 32301

DER
MAY 31 1984
BAQM

Re: Jacksonville Electric Authority(JEA)
Northside Generating Station
Proposed Auxiliary Boiler

Dear Mr. King:

I have reviewed JEA's letter to you dated May 15, 1984. The following comments and questions are provided concerning the permitting of the proposed auxiliary boiler:

(1) The Northside Generating Station has three(3) existing steam generators and one(1) existing auxiliary boiler (auxiliary boiler "B"). The existing auxiliary boiler "B" was recently permitted (copy enclosed) and is currently under Administrative Appeal as requested by the applicant (copies of the pertinent correspondence enclosed).

(2) This Agency does not support the use of the term "significant load" as it is nebulous.

We do support a condition which would limit the use of the auxiliary boiler if the main units were operating above a predetermined heat input (not Megawatt load). It is noted that a megawatt load does not accurately reflect the heat input due to varying unit efficiencies.

(3) Will the new auxiliary boiler and existing auxiliary boiler operate simultaneously?

(4) Will a baseline sulfur dioxide emission limit be established to determine if a <u>significant emission increase</u> occurs and thus trigger PSD review?

It is noted that in the last two years emissions from the NGS have been significantly reduced due to importation of power from Georgia. This fact is quite important in a determination of baseline emission data.

1655-3318

ALL-AMERICA CITY
AREA CODE 904 / AIR POLLUTION — 633-3033 OR 633-3303 / WATER POLLUTION — 633-3415
515 WEST 6TH STREET / JACKSONVILLE, FLORIDA 32206—4397

(5) What recordkeeping requirements will be necessary to ascertain PSD applicability?

If you have any questions concerning these comments, please advise.

Very truly yours,

Jerry E. Woosley

Jerry E. Woosley
Assistant Engineer

JEW/vj
Enclosure

cc: Mr. Doug Dutton - DER

Mehta
Worsley

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

April 24, 1984

Mr. Royce Lyles, Managing Director
Jacksonville Electric Authority
233 West Duval Street
Jacksonville, Florida 32202

Dear Mr. Lyles:

Duval County - AP
JEA - NORTHSIDE GENERATING STATION
Auxiliary Boiler "B" - Unit No. 1

Enclosed is Permit Number A016-78586, dated April 24, 1984 to operate the subject pollution source issued pursuant to Section(s) 403.087, Florida Statutes.

COPY

Should you object to this permit, including any and all of the conditions contained therein, you may file an appropriate petition for administrative hearing. This petition must be filed within fourteen (14) days of the receipt of this letter. Further, the petition must conform to the requirements of Florida Administrative Code Rule 28-5.201 (see reverse side of this letter). The petition must be filed with the Office of General Counsel, Department of Environmental Regulation, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32301.

If no petition is filed within the prescribed time, you will be deemed to have accepted this permit and waived your right to request an administrative hearing on this matter.

Acceptance of the permit constitutes notice and agreement that the Department will periodically review this permit for compliance, including site inspections where applicable, and may initiate enforcement action for violation of the conditions and requirements thereof.

Sincerely,

Frank Watkins, Jr.

Frank Watkins, Jr., P.E.
District Engineer

FW:vk

Enclosure
cc: Mr. Richard Breitmoser, P.E.
Jacksonville BES

DER Form 17-1.201(7)
Effective November 30, 1982

RULES OF THE ADMINISTRATIVE COMMISSION
MODEL RULES OF PROCEDURE
CHAPTER 28-5
DECISION DETERMINING SUBSTANTIAL INTERESTS

PART II
FORMAL PROCEEDINGS

28-5.201 Initiation of Formal Proceedings.

(1) Initiation of formal proceedings shall be made by petition to the agency responsible for rendering final agency action. The term petition as used herein includes any application or other document which expresses a request for formal proceedings. Each petition should be printed, typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double-spaced and indented.

(2) All petitions filed under these rules should contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name and address of the petitioner or petitioners, and an explanation of how his/her substantial interests will be affected by the agency determination;

(c) A statement of when and how petitioner received notice of the agency decision or intent to render a decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief;

(f) A demand for relief to which the petitioner deems himself entitled; and

(f) Other information which the petitioner contends is material.

****

A petition may be denied if the petitioner does not state adequately a material factual allegation, such as a substantial interest in the agency determination, or if the petition is untimely. (Section 28-5.201(3)(a), FAC)

DER Form 17-1.201(7)
Effective November 30, 1982

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHEAST DISTRICT

3426 BILLS ROAD
JACKSONVILLE, FLORIDA 32207

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

G. DOUG DUTTON
DISTRICT MANAGER

PERMITTEE: Jacksonville Electric Authority
233 West Duval Street
Jacksonville, Florida 32202

I.D. Number:	31-16-0045-13
Permit/Certification Number:	A016-78586
Date of Issue:	April 24, 1984
Expiration Date:	March 31, 1989
County:	Duval
Latitude/Longitude:	30:24:53/81:33:10
Section/Township/Range:	
Project:	Auxiliary Boiler "B", Unit No. 1
UTM	E-7446.940 N-3364.990

This permit is issued under the provisions of Chapter(s) 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named 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:

For the operation of a virgin No. 6 fuel oil or LPG fired auxiliary steam generating boiler. Heat input is limited to 35 x 10^6 BTUs per hour.

COPY

Located at 4377 Heckscher Drive, Jacksonville, Florida 32226

Supporting documents are as follows:

(1) Application received on November 16, 1983

(2) Additional information received on December 14, 1983, February 8, 1984 and February 21, 1984

PERMITTEE: Jacksonville Electric Authority

I.D. Number: 31-16-0045-13
Permit/Certification Number: A016-78586
Date of Issue: April 24, 1984
Expiration Date: March 31, 1989

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

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, plant or aquatic life or property and penalties therefor caused by the construction or operation of this permitted source, 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.

COPY

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as 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 the 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 notify and provide the department with the following information:

   a. a description of and cause of non-compliance; and

b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

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 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 arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

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 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance 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. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD)
( ) Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)
( ) Compliance with New Source Performance Standards

Copy

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

b. The permittee shall retain 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), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be 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 measurements;
- the person responsible for performing the sampling or measurements;
- 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.

15. 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 that 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 submitted or corrected promptly.

Permittee: Jacksonville Electric Authority

I. D. Number: 31-16-0045-13
Permit/Certification Number: A016-78586
Date of Issue: April 24, 1984
Expiration Date: March 31, 1989

SPECIFIC CONDITIONS:

1. The maximum allowable emission rate for each pollutant is as follows:

POLLUTANT	EMISSION RATE	MAXIMUM ALLOWABLE EMISSION
Visible Emissions	17-2.600(6)	20% opacity continuous 40% opacity for two (2) minutes per hour

2. Testing of emissions shall be accomplished at 90% to 100% of the permitted capacity. If testing is performed at a rate less than 90% of the permitted capacity, operation shall be limited to that capacity until such time as an acceptable test is performed at 90% to 100% of permitted capacity. When operation is restricted to a lower capacity, because of testing at such a level, the Department/Bio-Environmental Services Division, upon advanced notification, will allow operation at higher capacities if such operation is for demonstrating compliance at a higher capacity (never to exceed design capacity).

3. Notify the Jacksonville Bio-Environmental Services Division (BESD) 14 days prior to source testing. Copies of the test report(s) shall be submitted to BESD within 45 days after completion of testing.

4. The following pollutant(s) shall be tested at intervals indicated from the date of January 1, 1984.

*Visible Emissions - - - - - - 12 months

*While burning virgin No. 6 fuel oil

5. Submit an annual operation report to BESD for this source on the form supplied for each calendar year on or before March 1.

6. Any revision(s) to a permit (and application) must be submitted and approved prior to implementing.

COPY

Permittee: Jacksonville Electric Authority

I. D. Number: 31-16-0045-13
Permit/Certification Number: A016-78586
Date of Issue: April 24, 1984
Expiration Date: March 31, 1989

SPECIFIC CONDITIONS:

7. Operation is limited to 8760 hours per year.

8. The sulphur content of the virgin No. 6 fuel oil is limited to 1.8% by weight. Fuel oil sulphur analysis shall be submitted annually with the required visible emissions test.

9. Operation shall not be simultaneous with Unit No. 1 except during startup of Unit No. 1.

COPY

Issued this 24 day of April, 1984

City of Jacksonville
Bio-Environmental Services Division

Donald C. Bayly

Donald C. Bayly, Division Chief

5 Pages attached

State of Florida
Department of Environmental Regulation

Doug Dutton

Doug Dutton, District Manager

DER Form 17-1.201(5) Effective November 30, 1982

185580

BEST AVAILABLE COPY

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

DEPARTMENT OF ENVIRONMENTAL REGULATION STATE OF FLORIDA

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Oil Fired Boiler [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Jacksonville Electric Authority COUNTY: Duval

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

COPY

SOURCE LOCATION: Street 4377 Heckscher Drive City Jacksonville

UTM: East 17-446.94 North 3364.99

Latitude 30 ° 24 ' 53 "N Longitude 81 ° 33 ' 10 "W

APPLICANT NAME AND TITLE: Royce Lyles, Managing Director

APPLICANT ADDRESS: 233 West Duval Street, Jacksonville, Florida 32202

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Jacksonville Elec. Authority

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

*Attach letter of authorization

Signed: Royce Lyles

Royce Lyles, Managing Director
Name and Title (Please Type)

Date: 11/14/83 Telephone No. 904-633-4730

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

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

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

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed ____________________

Richard Breitmoser
Name (Please Type)

Jacksonville Electric Authority
Company Name (Please Type)

P. O. Box 53015, Jacksonville, Florida 32201
Mailing Address (Please Type)

Florida Registration No. 17020 Date: 11/14/ Telephone No. 904-633-4517

COPY

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

This is an application for formal permitting of an existing stand-by boiler, installed originally about 1966, as an auxiliary to JEA's Northside Generating Station.

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

Start of Construction ____________ Completion of Construction ____________

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

The only pollution control system is the combustion control system, not separately costed.

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

This auxiliary boiler, when in service, emits flue gas through the stack for NS Steam Unit #1, AP 16-44730, Rev. 10/5/81, expires July 31, 1986.

E. Requested permitted equipment operating time: hrs/day_____; days/wk_____; wks/yr_____;
if power plant, hrs/yr_____; if seasonal, describe: This unit operates only as a standby unit for essential services when the station generating units are shutdown. It is estimated to have operated about 2% of the time in the past year and less than that previously.

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

1. Is this source in a non-attainment area for a particular pollutant? _____
   a. If yes, has "offset" been applied? _____
   b. If yes, has "Lowest Achievable Emission Rate" been applied? _____
   c. If yes, list non-attainment pollutants. _____

COPY

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. _____
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections V and VII. _____
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? _____
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? _____

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

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

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

This source pre-dates RACT rules. It emits less than 50 T/yr. of SO_2 and is estimated to emit about 10 T/yr of NO_x and 5 T/yr of particulate. It does not operate, however, except when the major station units are shut down or at low levels of operation. So its emissions are not additive to permitted station emissions.

BEST AVAILABLE COPY

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

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

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

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

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

2. Product Weight (lbs/hr): ____________

COPY

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

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	
SO_2	34	22	1.97 Lb/MB	34	NA		
NO_x	14	9	---	---	NA		
Particulate	3 1/2	2 1/4	0.1 Lb/MB	3 1/2	NA		

[1] See Section V, Item 2.

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

[3] Calculated from operating rate and applicable standard.

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

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
#6 Fuel Oil	35	235	35
LPG	55	365	35

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

Fuel Analysis:

Percent Sulfur: < 1.8 Percent Ash: < 0.15

Density: ± 8 lbs/gal Typical Percent Nitrogen: 0.5

* Heat Capacity: ± 18,500 BTU/lb ± 150,000 BTU/gal

Other Fuel Contaminants (which may cause air pollution): None known

* LPG: ± 21,500 Btu/Lb, ± 96,000 Btu/gal.

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

Annual Average 0 Maximum 0

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

Negligible

BEST AVAILABLE COPY

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

Stack Height: 250 ft. Stack Diameter: 16.5 ft.

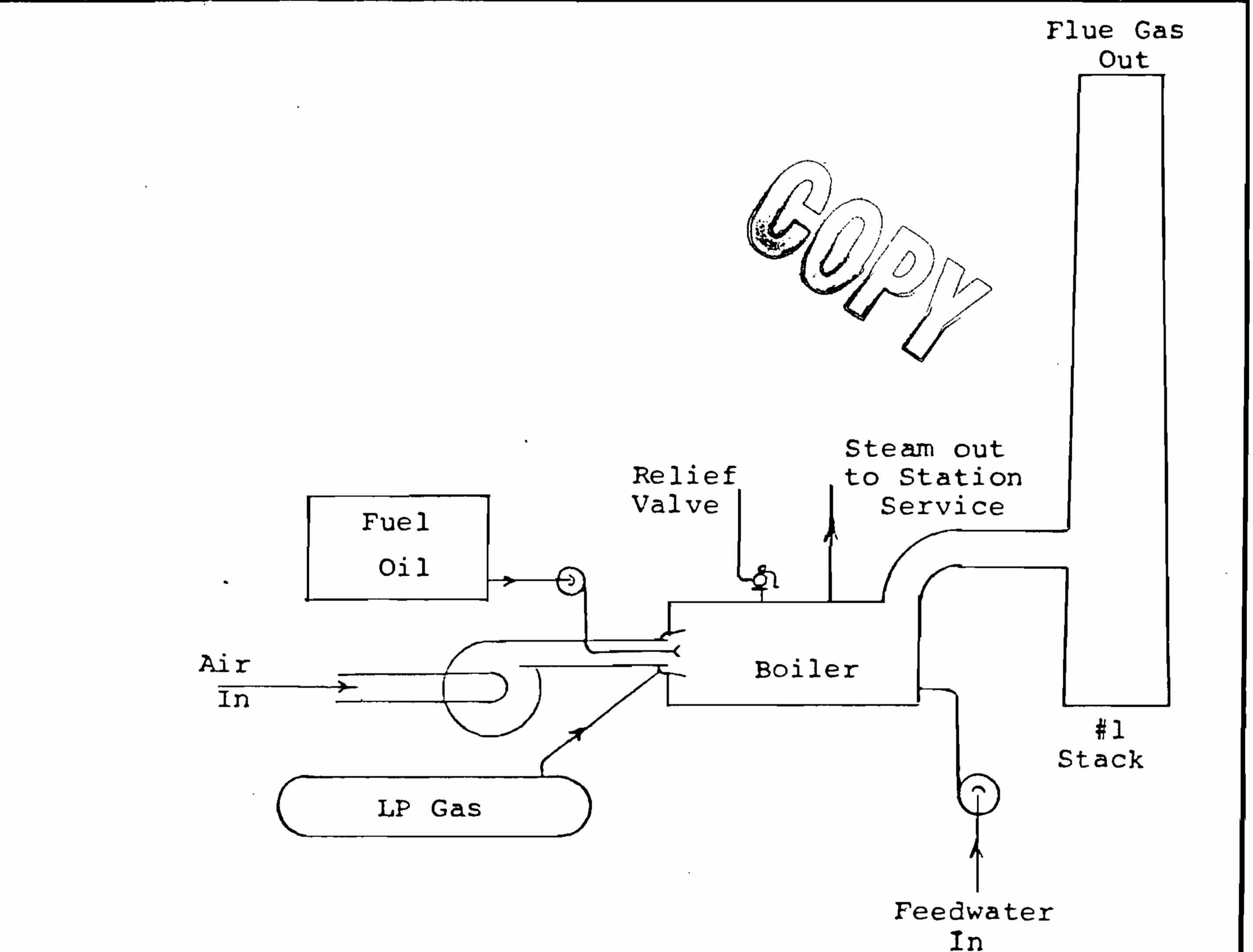
Gas Flow Rate: 14,000 ACFM 6100 DSCFM Gas Exit Temperature: 600 °F.

Water Vapor Content: 10 % Velocity: 1.1 FPS

(Common stack with Unit No. 1)

Date 11/3/83	JACKSONVILLE ELECTRIC AUTHORITY	Sheet 1 of 1

Northside Generating Station
Auxiliary Boiler Flow Diagram



SK-PS-83-12

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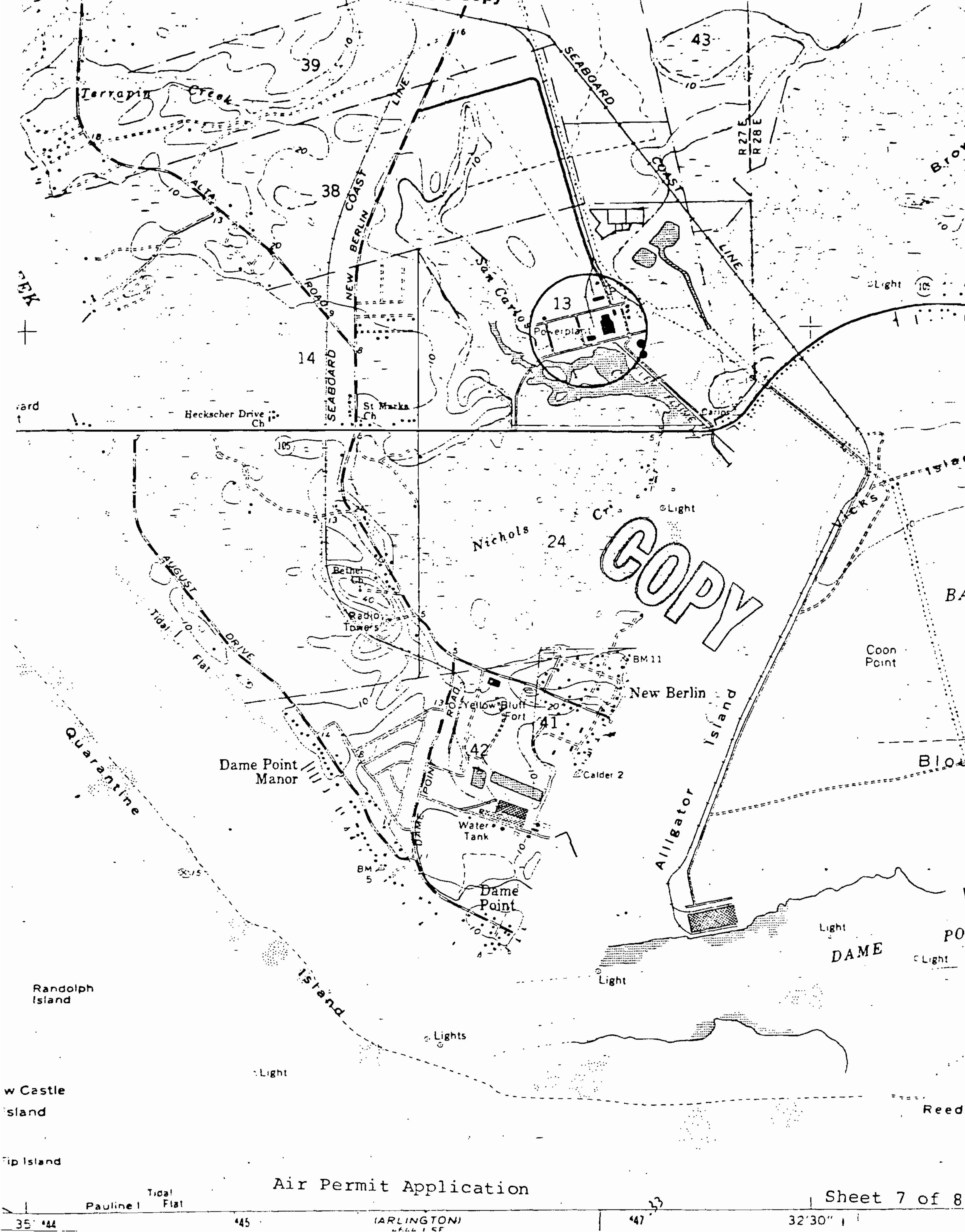

Air Permit Application

Sheet 7 of 8

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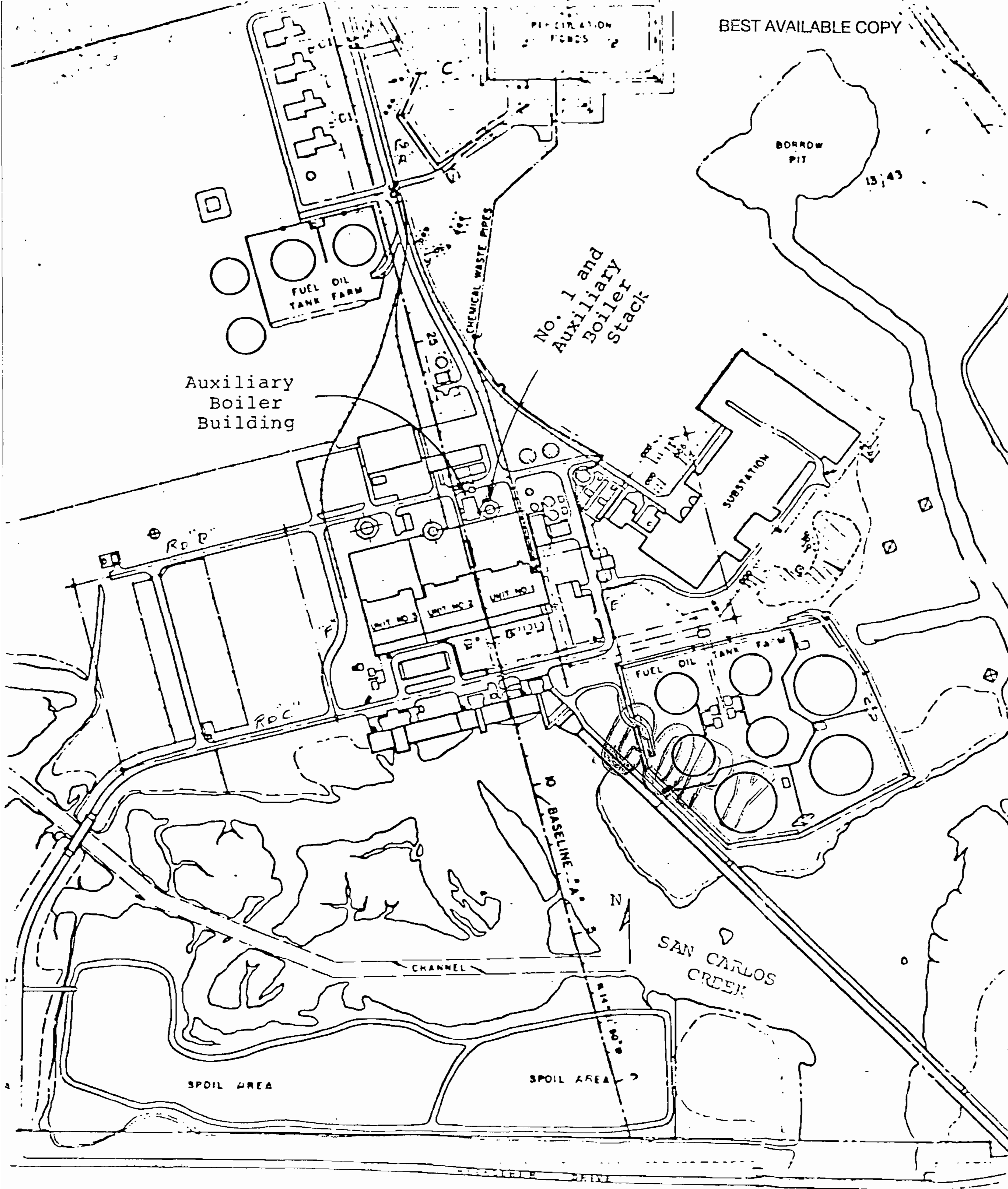

Air Permit Application

NORTHSIDE STATION
PLOT PLAN
From R S & H 78130 D1500

Sheet 8 of 8

SK-PS-81-15
July 24,19

Pace
Mehta
Woosley

Jacksonville Electric Authority

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JEA POWER TO SERVE

RECEIVED
MAY 2 1984
AIR & WATER POLLUTION CONTROL - CITY OF JACKSONVILLE

April 30, 1984

Mr. G. Doug Dutton, District Manager
Fla. Dept. of Environmental Regulation
3426 Bills Road
Jacksonville, Florida 32202

Dear Mr. Dutton:

Subject: Permit No. AO 16-78586
Northside Auxiliary Boiler "B"

This permit was received on April 26 and has been reviewed. We find it satisfactory except for Specific Condition 9 which states: "Operation shall not be simultaneous with Unit No. 1 except during start-up of Unit No. 1". We cannot assure that, under all operating circumstances, the station could comply with this condition. Although installed with No. 1 and ducted to the common stack, the auxiliary boiler now serves all three units.

COPY

Please accept this as JEA's petition, under Rule 28-5.201 FAC, for relief from this condition. It is possible that No. 1 generating unit could be on line, at essentially full capability, and that steam would be needed at auxiliary pressure for start-up of another unit.

Considering our normal modes of operation, Specific Condition 9 really seems superfluous. If the Department believes, however, that protection is needed in total station emissions, the following replacement of Condition 9 is recommended: "The unit shall not operate additive to main station units at significant

(CONT.)

loads". "Significant loads" should be interpretted as loads sufficiently above minimum load to permit any main unit in operation to provide its own soot blowing steam. This is because when units are at minimum loads the auxiliary boiler may be operated solely for soot blowing purposes.

I trust that this revision is acceptable. If not, we will be happy to discuss alternatives with you.

Very truly yours,

Richard Breitmoser, P.E.
Division Chief
Research & Environmental
Affairs Division

RB/PLS/lwr

cc: H. W. Chapman
W. R. Steinmeyer
P. L. Suter
R. S. Pace, Jacksonville BESD

Worsley –

Jacksonville Electric Authority

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JEA POWER TO SERVE

Dupe

May 3, 1984

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RECEIVED MAY 4 1984 AIR & WATER POLLUTION CONTROL - CITY OF JACKSONVILLE

Ms. V. J. Tschinkel, Secretary
Fla. Dept. of Env. Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Ms. Tschinkel:

Subject: Permit No. AO 16-78586
Northside Auxiliary Boiler "B"

COPY

JEA hereby petitions, under Rule 28-5.201, for relief from Specific Condition No. 9 of the subject newly issued permit. The permit, dated April 24 at DER's Northeast District Office, was received by JEA on April 26.

The permit is satisfactory except for the noted condition which states:

"Operation shall not be simultaneous with Unit No. 1 except during start-up of Unit No. 1".

This condition presumes that when Unit No. 1 is on line it will always have excess steam available to provide auxiliary services for the other two units at the generating station. It also presumes that interconnections can always be set up for transfer of steam among the three generating systems. Neither of these conditions can be assured in all operating situations.

Considering past modes of station operation and the very low operating time of the auxiliary boiler, Specific Condition No. 9 really seems superfluous. If the Department believes, however, that protection is needed from addition of the auxiliary boiler output to the normal total station emission cap, the following statement is proposed as a revised Specific Condition No. 9:

"The unit shall not operate additive to main station units at significant loads".

"Significant loads" in this context would be loads sufficiently above minimum load on each main unit to permit each main unit in operation to provide its own sootblowing steam. This is because when any main unit is at minimum load it may require an external source (the auxiliary boiler) for soot blowing steam.

Please note that JEA wrote to District Manager G. D. Dutton on April 30 requesting this relief. This petition formalizes the earlier request.

Your consideration in this matter is earnestly solicited. We will be happy to discuss this situation, if desired, with you or your delegate.

Very truly yours,

Richard Breitmoser, P.E.
Division Chief
Research & Environmental
Affairs Division

RB/PLS/lwr

cc: G. D. Dutton, NE Office
R. S. Pace, BESD
H. W. Chapman
W. R. Steinmeyer
P. L. Suter
Files

1680 Q

May 11, 1984

Mr. Richard Breitmoser, P.E.
Division Chief
Research & Environmental Affairs
Jacksonville Electric Authority
P.O. Box 53015
Jacksonville, Florida 32201

COPY

Re: Auxiliary Boiler "B"

Dear Mr. Breitmoser:

This Agency has received a copy of your petition for relief from Specific Condition No. 9 of Permit A016-78586. The information presented in the permit application and additional information received does not reflect the possible operating conditions outlined in your petition for relief. Specifically these differences are:

> The comments on page 3 of 8 of the application received on February 10, 1984 indicate that the Auxiliary Boiler "B" is for "...essential services when the station generating units are shutdown". Later on the same page you state "It does not operate, however, except when the major station units are shut down or at low levels of operation", and "It was to be operated only when No. 1 was down...". Paragraph 2 of your petition states "It is possible that No. 1 generating unit could be on line, at essentially full capability, and that steam would be needed at auxiliary pressure for start-up of another unit". In paragraph 3 of your petition you state "…. when units are at minimum loads the auxiliary boiler may be operated solely for soot blowing purposes".

Prior to further review of your request for a change in Specific Condition No. 9, the various operating capabilities of the auxiliary boiler in relation to the other generating units needs to be clarified. In addition, please provide the maximum heat input at which main units will operate simultaneously with the auxiliary boiler.

Your response is requested as soon as possible. If you have further questions, please advise.

Very truly yours,

Jerry E. Woosley
Assistant Engineer

JEW/vj

cc: Mr. Doug Dutton - DER
cc: Ms. Victoria Tschinkel

COPY

Best Available Copy

1670 F
1680 P
1690 L

May 11, 1984

Mr. Clair Fancy, P.E.
Deputy Bureau Chief
Central Air Permitting Section
Dept. of Environmental Regulation
2600 Blairstone Road
Tallahassee, Florida 32301

Re: Jacksonville Electric Authority
Northside, Southside, and Kennedy
Generating Station

Dear Mr. Fancy:

Enclosed are construction permit applications for auxiliary boilers at Southside and Kennedy Generating Stations. Comments are provided as follows on these two applications as well as the construction permit application for the auxiliary boiler at Northside Generating Station which was previously sent directly to your Office:

(1) The proposed auxiliary boiler at the Northside Generating Station is subject to (BACT) Rule 17-2.600(6), Florida Administrative Code(FAC).

(2) The proposed auxiliary boilers at Southside and Kennedy Generating Stations appear to be subject to the following:

(A) (RACT) Rule 17-2.650(2)(a)2. FAC.
(B) (BACT) Rule 17-2.600(6). FAC.

Note: Neither Rule seems to exclude the applicability of the other.

The processing fee($1,000 Check No. 364432) for the Northside Auxiliary Boiler Construction Permit application is also enclosed.

If this Agency may be of further assistance in this matter, please advise.

Very truly yours,

Jerry E. Woosley
Assistant Engineer

JEW/vj
Enclosure

cc: Mr. Doug Dutton - DER, without enclosure
cc: Mr. Richard Breitmoser, P.E., without enclosure

Jacksonville Electric Authority

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JEA "POWER TO SERVE"

Paul
Mehta
Woosley

RECEIVED
MAY 17 1984
AIR & WATER POLLUTION CONTROL - CITY OF JACKSONVILLE

May 15, 1984

Mr. Robert King, Permitting Specialist
Fla. Dept. of Environmental Regulation
2100 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. King:

Subject: Permit and BACT Application - Proposed Auxiliary Boiler, Northside Generating Station

Your Notice of Incomplete Application, of which we have been given phone notification, requests additional information and assurances. Herewith, by items, are additional data or explanations.

1. \$1000 application fee was forwarded through Jacksonville Bio-Environmental Services Division on May 1. This is probably an excessive fee based on actual loadings for most operating years but the "potential emission per year" on which the fee is based definitely exceeds 100 Tons for SO_2.

2. You ask for quantification of the phrase "any significant loads" used in the fifth paragraph of our April 19 transmittal letter. This is discussed further in a letter of May 3 to Ms. Tschinkel relative to the existing auxiliary boiler at the station. A "significant load" on any main station unit is the minimum stable operating load plus enough steam to permit the unit to carry its own auxiliary steam requirement including soot blowing. For the three main units, these loads are approximately:

Unit #1: 30 MW + 10 MBtu/hr.
Unit #2: 225 MW + 10 MBtu/hr.
Unit #3: 130 MW + 10 BMtu/hr.

The auxiliary boiler may be needed when any main unit is off-line or is operating below its indicated minimum heat input. It will not normally be operated when all three main units are above their respective indicated minimums.

3. The auxiliary boiler will never operate so as to increase total momentary station heat input above the combined permitted total of the three main units.

(CONT.)

4. It is very unlikely that the auxiliary unit will ever operate 8760 hours per year. That possibility exists, however, as new coal fired units come on line and Northside's oil fired units may be needed even less than at present. JEA, therefore, requests that no limitation be placed on operating time for the proposed auxiliary boiler.

5. An operating log will be maintained for the auxiliary boiler. It will include operating time and loads and metered fuel consumption.

6. The Bailey "Network 90" combustion control is a solid state logic control system which will meter air and fuel flows and match those flows to each other and to the load requirements. More information on the control system is provided in the attached pamphlet.

I believe this information covers that requested. If you need any clarification or any further material, please let me know.

Very truly yours,

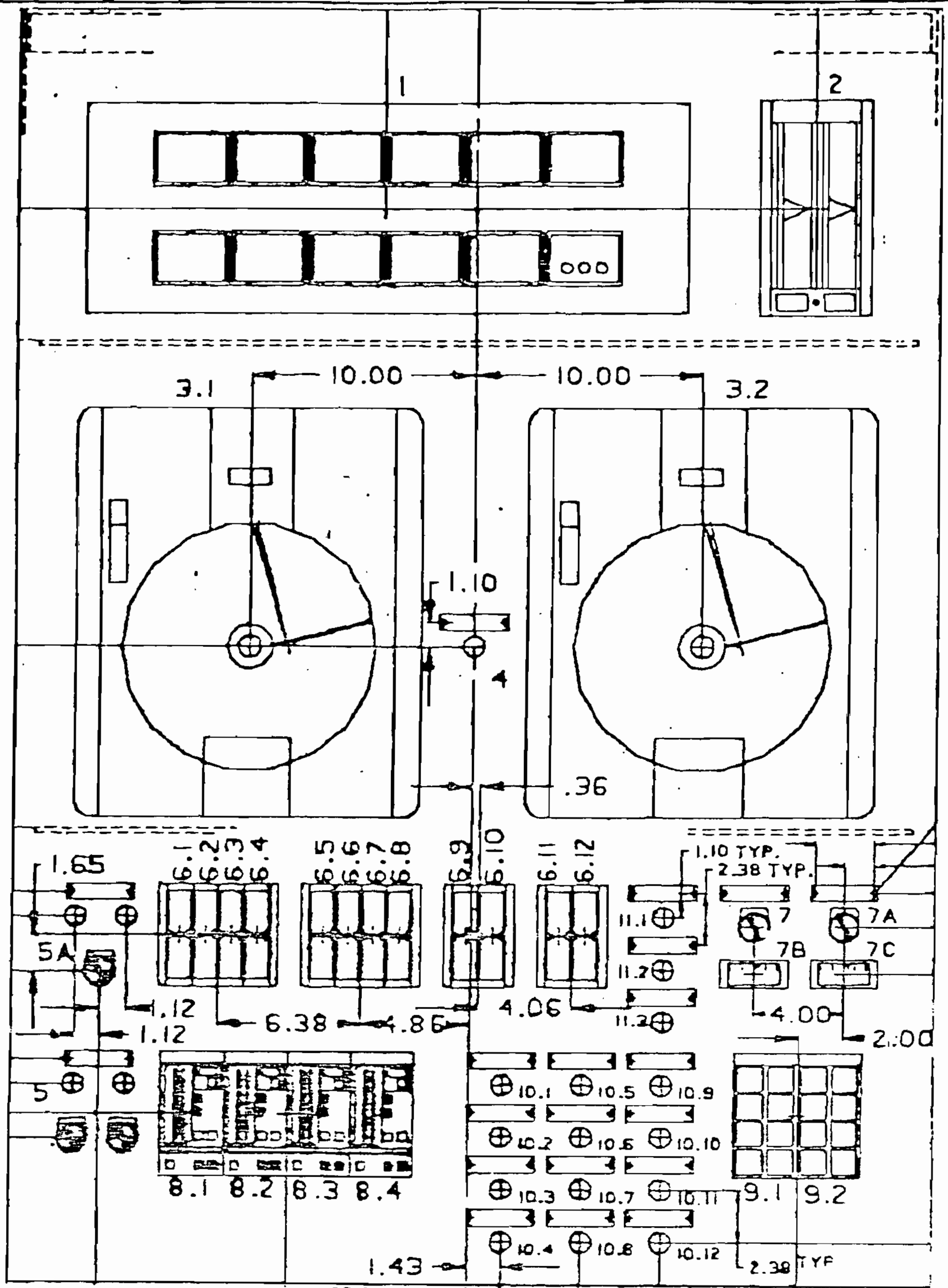
Paul L. Suter
Research & Environmental
Affairs Division

PLS/lwr

cc: W. R. Steinmeyer
D. W. Stanley
R. Breitmoser
E. R. Joyce
R. S. Pace, BESD
G. D. Dutton, DER Northeast

Enclosure: Bailey Data

Date MAY 15 1984 | JACKSONVILLE ELECTRIC AUTHORITY | Sheet 1 of 5



AUX. BOILER CONTROL PANEL
FOR

CUSTOMER: JACKSONVILLE ELECTRIC AUTHORITY
PLANT: NORTHSIDE GENERATING STATION
CONTRACTING ENG.: HOLMAN BOILER
B.C.CO. JOB NO: 168F11 CUST. ORDER NO.: 22301

REVISED LEGEND

S.O.#168F11

4842033A1 | DAD 432

1.5"=1'-0" | 2-3-84

BAILEY CONTROLS COMPANY
BABCOCK & WILCOX

E 4842033B

Mr R J Pace:
These are attach-
ments for [illegible]
letter to Mr Rob't
King, DER, Tallahassee.

ITEM	DESCRIPTION	SERVICE
1	ANNUNCIATOR	ALARMS
2	MULTIPOINTER (BY CUSTOMER)	CUTOUT ONLY
3.1	RECORDER	OIL FLOW, AIR FLOW
3.2	RECORDER	STM. FLOW, DRUM LEVEL, AUX. D.A. LEVEL, FURN. GAS TEMP.
4	INDICATING LIGHT	LOW DRUM LEVEL TRIP TEST
5	SEL. SW. & INDICATING LIGHTS	F.D. FAN MANUAL-AUTO, STOP-START
5A	SEL. SW. & INDICATING LIGHTS	STACK DAMPER
6.1	INDICATOR	F.W. PRESS.
6.2	INDICATOR	DRUM PRESS.
6.3	INDICATOR	SH. OUT PRESS.
6.4	INDICATOR	DRUM LEVEL
6.5	INDICATOR	BNR. GAS PRESS.
6.6	INDICATOR	BNR. OIL PRESS.
6.7	INDICATOR	ATOM STM. PRESS.
6.8	INDICATOR	FUEL OIL TEMP.
6.9	INDICATOR	STEAM PRV OUT PRESS.
6.10	INDICATOR	AUX. D.A. LEVEL
6.11	INDICATOR	FLAME DETECTOR A
6.12	INDICATOR	FLAME DETECTOR B
7	SELECTOR SWITCH	HEAT TRACE "A"
7A	SELECTOR SWITCH	HEAT TRACE "B"
7B	INDICATOR	HEAT TRACE "A"
7C	INDICATOR	HEAT TRACE "B"
8.1	DIGITAL CONTROL STATION	BOILER MASTER
8.2	DIGITAL CONTROL STATION	FEEDWATER
8.3	DIGITAL CONTROL STATION	FUEL OIL
8.4	DIGITAL CONTROL STATION	F.D. FAN CONTROL
9.1	DIGITAL LOGIC STATION	BURNER CONTROL
9.2	DIGITAL LOGIC STATION	BURNER CONTROL
10.1	ANNUNCIATOR INDICATING LIGHT	DRUM PRESS > 460 PSIG
10.2	ANNUNCIATOR INDICATING LIGHT	LOW DRUM LEVEL
10.3	ANNUNCIATOR INDICATING LIGHT	AIR FLOW < MIN
10.4	ANNUNCIATOR INDICATING LIGHT	NO FLAME
10.5	ANNUNCIATOR INDICATING LIGHT	F.D. FAN STOPPED
10.6	ANNUNCIATOR INDICATING LIGHT	LOW GAS PRESS
10.7	ANNUNCIATOR INDICATING LIGHT	HIGH GAS PRESS
10.8	ANNUNCIATOR INDICATING LIGHT	OIL GUN NOT COUPLED
10.9	ANNUNCIATOR INDICATING LIGHT	LOW OIL TEMP
10.10	ANNUNCIATOR INDICATING LIGHT	LOW OIL PRESS
10.11	ANNUNCIATOR INDICATING LIGHT	LOW ATOMIZING STEAM PRESS
10.12	ANNUNCIATOR INDICATING LIGHT	OPERATOR TRIP
11.1	INDICATING LIGHT	SEQ. REQUIRE IGNITOR FLAME
11.2	INDICATING LIGHT	SEQ. REQUIRE GAS FLAME
11.3	INDICATING LIGHT	SEQ. REQUIRE OIL FLAME

b. Analog Control

The analog control system shall be designed and equipped to provide the following features:

(1) The combustion control system shall provide automatic control of the firing rate on oil firing only. The gas firing rate will be held at a continuous fixed rate based on the capacity of the gas burner ring and gas pressure.

(2) The system shall continuously monitor the boiler pressure rate of change and an interlock shall be provided so that when the boiler pressure is increasing rapidly above 400 psig, a "runback" will be initiated to decrease the firing rate equivalent to the maximum turn down of the oil burner. This runback condition will remain in effect until the boiler pressure decreases to less than 400 psig, at which time the firing rate shall transfer back to the demand output from the boiler master at a controlled rate of change. An alarm contact in the Network 90 system shall be included and wired to an indication on the free standing panel to provide status indication of the "boiler pressure runback" condition.

(3) If the superheater requires temperature protection under low steam flow conditions, provisions for this shall be included in the combustion control.

(4) For drum level control, a standard two element feedwater control using steam flow as the index of feedwater demand shall be provided.

(5) For each control loop, a panel mounted control station shall be provided, including but not limited to:

(a) Boiler Master
(b) Forced Draft Air
(c) Fuel Oil Control
(d) Feedwater Control

The control station will provide an analog display and digital display in standard engineering units of the process variable and control output.

The control station will be tied to the serial communications link, and will switch to manual operation automatically upon the failure of a corresponding control module. A visual alarm on the station shall indicate the system has automatically switched to manual operation. Further, the control station shall be wired to the control system termination board, so that field I/O's may be accessed directly, without the use of the serial communications link.

4.04E TRANSMITTERS

For all differential pressure, gauge pressure, and temperature applications, Rosemount 4-20 mA output transmitters shall be furnished with built-in output signal meters. It shall be the responsibility of the Vendor to insure that the measuring range of all transmitters supplied be compatible with functional requirements of the boiler. When an orifice or condensing reservoir is required in conjunction with a transmitter, it shall be the responsibility of the Vendor to insure compatibility of the orifice or reservoir with the process measuring range previously described.

Process connection hardware such as equalizing manifolds, drain or blowdown piping, and isolation valves shall be furnished on all differential pressure transmitters.

Process connection hardware such as drain or blowdown piping and isolation valves shall be furnished on all gauge pressure transmitters.

Separation devices such as diaphragm separators or separation chambers filled with anti-freeze shall be provided with appropriate hand isolation valves on all transmitters, gauges and pressure control devices requiring process connection to the fuel oil header.

Transmitters to be furnished shall include, but not be limited to:

1. Drum level (two separate transmitters)
2. Auxiliary deaerator level
3. Steam flow (with compatible orifice)
4. Air flow
5. Drum pressure

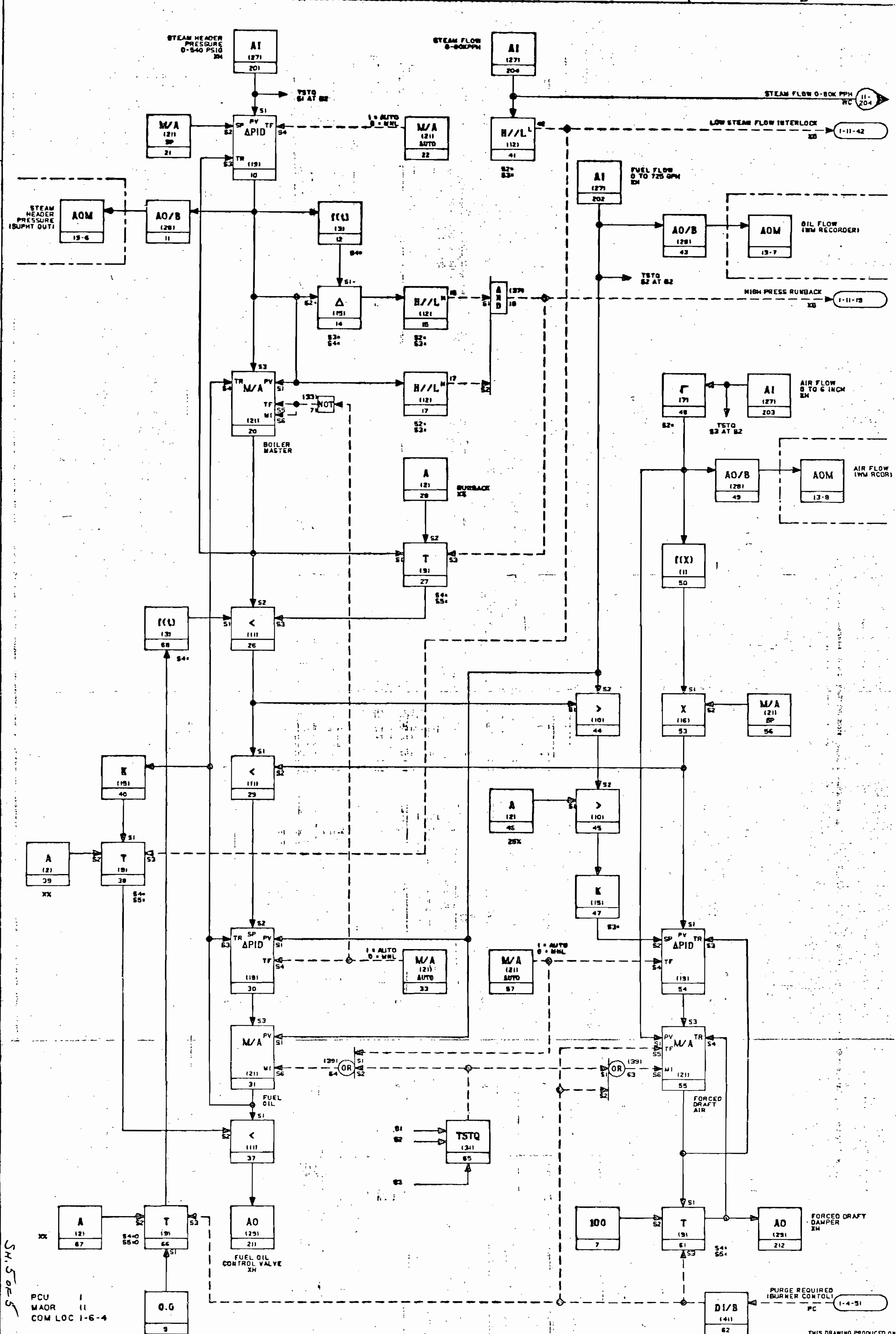
Date May 15, 1984

JACKSONVILLE ELECTRIC AUTHORITY

Sheet 5 of 5

Sheet 5 is the Bailey "Network 90" Schematic for the Auxiliary Boiler. It is Bailey Drawing D808T901A.

Best Available Copy



Sh. 5 of 5

THIS DRAWING PRODUCED ON BAILEY CONTROLS COMPANY CAD FACILITY EQUIPMENT.

F.A. DWG 17

DATE 2-24-84

D08087901A

Bailey Controls Company
Babcock & Wilcox, a McDermott company

NETWORK 90 - CONFIGURATION
FUEL/AIR CONTROL

CUSTOMER: JACKSONVILLE ELECTRIC AUTHORITY
PLANT: NORTHSIDE GENERATING STATION
CONTRACTING ENG:
B.C.CO. JOB NO.: [illegible]

CUST.ORDER NO.: [illegible]

MAY 15 1984

REV | DATE | CHANGE | APVD | REV | DATE | CHANGE | APVD

CAD/CAM

Fancy

Jacksonville Electric Authority

233 WEST DUVAL STREET • P. O. BOX 53015 • JACKSONVILLE, FLORIDA 32201

JEA POWER TO SERVE

DER

MAY 23 1984

BAQM

May 21, 1984 5/29

Mr. J. E. Woosley
Asst. Pollution Control Engineer
Bio-Environmental Services Division
515 West Sixth Street
Jacksonville, Florida 32206

Dear Mr. Woosley:

Subject: Auxiliary Boiler "B", NSGS

Your letter of May 11 to Mr. Breitmoser requests clarification of the operating modes of the auxiliary steam system at Northside Generating Station. Your requests are similar to the first three items in Mr. Fancy's letter of May 14 to Mr. Lyles. A copy of JEA's response to that letter, addressed May 15 to Mr. Robert King, is attached.

Because the auxiliary boilers can be required for so many circumstances, no single, concise statement can detail their operating modes. This is significantly different from when Auxiliary "B" and its twin were installed in the new, one unit, Northside Station. At that time, either NS #1, as JEA's newest, largest, most efficient unit, was on line at a good load and needed no help; or #1 was down and the auxiliaries were needed for any station steam service. The system was simple and straight forward.

Northside Station, as you know, now has three main units which were installed at three different times. Each of these three, when in service, can feed the common auxiliary steam system from "cold reheat" steam lines through check valves which will not permit back-flow into any of the three generating steam systems. They can provide this steam, however, only when they have enough load so that the steam withdrawal will not starve the reheat section of the boiler or the reheat turbine stages and the dual-flow low pressure turbine which follows. This may further clarify the explanation of "significant load(s)" given in Mr. Breitmoser's letter of April 30 to Mr. Dutton.

There could also be system conditions when only one or two units are available at Northside and are needed at full availability for system electrical load. If then low pressure

Jacksonville Electric Authority

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JEA "POWER TO SERVE"

to Pace
Mehta
Woosley

May 21, 1984

Mr. J. E. Woosley
Asst. Pollution Control Engineer
Bio-Environmental Services Division
515 West Sixth Street
Jacksonville, Florida 32206

Dear Mr. Woosley:

Subject: Auxiliary Boiler "B", NSGS

Your letter of May 11 to Mr. Breitmoser requests clarification of the operating modes of the auxiliary steam system at Northside Generating Station. Your requests are similar to the first three items in Mr. Fancy's letter of May 14 to Mr. Lyles. A copy of JEA's response to that letter, addressed May 25 to Mr. Robert King, is attached.

COPY

Because the auxiliary boilers can be required for so many circumstances, no single, concise statement can detail their operating modes. This is significantly different from when Auxiliary "B" and its twin were installed in the new, one unit, Northside Station. At that time, either NS #1, as JEA's newest, largest, most efficient unit, was on line at a good load and needed no help; or #1 was down and the auxiliaries were needed for any station steam service. The system was simple and straight forward.

Northside Station, as you know, now has three main units which were installed at three different times. Each of these three, when in service, can feed the common auxiliary steam system from "cold reheat" steam lines through check valves which will not permit back-flow into any of the three generating steam systems. They can provide this steam, however, only when they have enough load so that the steam withdrawal will not starve the reheat section of the boiler or the reheat turbine stages and the dual-flow low pressure turbine which follows. This may further clarify the explanation of "significant load(s)" given in Mr. Breitmoser's letter of April 30 to Mr. Dutton.

There could also be system conditions when only one or two units are available at Northside and are needed at full availability for system electrical load. If then low pressure steam is needed for preparing another main unit for service, an auxiliary boiler could be called on for that service. It would be very unusual that auxiliary boiler service would be needed when all three generating units are in service and, without reservation, I reiterate from the May 15 letter to Mr. King:

"3. The auxiliary boiler will never operate so as to increase total momentary station heat input above the combined permitted total of the three main units."

This does not quite answer your request for "the maximum heat inputs at which main units will operate simultaneously with the auxiliary boiler". It is very unlikely, but I can hypothesize any two units at maximum capability and the third unit being synchronized at minimum load before the auxiliary boiler is shutdown. In fact, the three units have not operated simultaneously since August, 1982. If the hypothetical situation came to be, the total heat with the two largest boilers on line, could be:

Unit No. 3	5022 MBtu/hr	(Permit Max.)
Unit No. 1	2767 MBtu/hr	(Permit Max.)
Unit No. 2	900 MBtu/hr	(Est. minimum stable load).

This situation, if it ever happened, would not last long since the incoming unit would be brought up to improve its efficiency and the two on-line units would be backed off to their best efficiency points and each generating unit would then provide for its own auxiliary steam requirements.

The auxiliary boilers are there for what ever need they can fulfill (which is any station steam service except electrical generation). This is both the reason that their various conditions of service are hard to define and that JEA does not want limitations (except for maximum station fuel consumption) on their hours or modes of operation.

All of the quotations in your letter of May 11 are true for normal station operations. The only one which should be modified is the second which could better state: "It does not <u>normally</u> operate, however, except when the major station units are shut down or at low levels of operation".

(CONT.)

I hope this letter will help clarify our auxiliary boiler requirements. If you wish to discuss any part of it, please let me know and I will arrange to meet you along with station personnel who are more directly acquainted with the possible operating situations.

Very truly yours,

Paul L. Suter

Paul L. Suter
Research & Environmental
Affairs Division

COPY

PLS/lwr

cc: W. R. Steinmeyer
D. W. Stanley
R. Breitmoser
G. D. Dutton, DER, NE
C. H. Fancy, DER, Tallahassee
R. S. Pace, BESD

Attachment: May 15th letter

Bob K.

Jacksonville Electric Authority

233 WEST DUVAL STREET • P. O. BOX 53015 • JACKSONVILLE, FLORIDA 32201

JEA "POWER TO SERVE"

DER

APR 23 1982

BAQM

April 20, 1982

Mr. Robert Steven Pace
Pollution Control Engineer
Bio-Environmental Services Division
515 West Sixth Street
Jacksonville, Florida 32206

Dear Steve:

Re: Permit AO 16-48311, April 12, 1982
JEA Northside Generating Station
#3 Steam Generator

This new permit, addressed to Mr. Lyles, was received April 12, 1982 from the St. Johns River Subdistrict of DER. We discussed the permit conditions in your office on April 16 and you agreed to the following corrections and minor amendments:

Condition 2 (p. 5): Maximum opacity will be 20%. Soot blowing particulate is 1509.0 lb/hr, not 509.0. You will verify or correct the figure of 188.7 T/yr.

Condition 5: The permit will be written for a 12 month stack test interval. JEA may then apply, on a year to year basis, for a 40% opacity limit and quarterly testing as provided in 17-2.600(5)(b)1. SO_x will not be tested in the stack since it is controlled by fuel sulfur content.

Condition 8 will be deleted.

Condition 9: CO_2 will be monitored at the stack, not O_2.

(CONT.)

It is JEA's understanding that, because of the routine nature of the changes, this letter will be accepted in lieu of a formal petition and administrative hearing. Your assistance and cooperation in clarifying our permit conditions is appreciated.

Very truly yours,

Paul L. Suter
Research & Environmental
Affairs Division

PLS/lwr

cc: Doug Dutton - Subdistrict Manager
Clair Fancy - DER, Tallahassee
H. W. Chapman
B. M. Wirz
W. R. Steinmeyer
R. Breitmoser

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee		
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Date Due:	Date Due:	

TO: Buck Oven, Power Plant Siting Section

THRU: Clair Fancy, Deputy Chief, BAQM CHF

FROM: Bob King, BAQM BK

DATE: November 18, 1981

SUBJ: Response to the JEA's Comments on Draft Conditions of Certification

1. The Bureau feels that most comments from JEA on the draft conditions are acceptable except for these comments on Condition Nos. 5, 13, and 15.

2. We disagree on JEA's resolution on draft Condition No. 5. The draft condition is not inconsistent with the conditions in the revised federal PSD preliminary determination. Therefore, we believe that the condition should be retained without any change.

3. JEA's resolution on draft Condition 13 did not point out the reason why they object to the limits addressed for the auxiliary boilers. The condition should not be changed if there is not good reason for it.

4. The SO_2 emission limit is 0.76 lb/MMBTU for the proposed main units, which requires 90% SO_2 reduction based on the federal NSPS. The Bureau cannot agree with the JEA's resolution on draft Condition 15. Bypass reheat is continuous process. The quantity of flue gas bypassed is 25% or more. The Bureau does not believe that JEA can meet the NSPS limit on SO_2 emissions with the amount of bypassing flue gas. The attached document will give good reasons why bypass reheat should not be used in the proposed project.

BK:caa

It should be noted that the higher water vapor content in the gas offsets to some extent the adverse effects of gas cooling. Since the water vapor has a lower density than do other constituents of the gas, it makes the plume more buoyant. The effect is small, however, and has been omitted in developing the curves.

It is concluded that for the high efficiencies of SO_2 removal (85 - 95%), reheating is not likely to be economically justified except in marginal situations where the inlet SO_2 to the scrubber is so high that even with high SO_2 removal ambient concentration is still close to exceeding the standard.

There are some considerations, however, that may make the situation worse than it appears. If there is no reheat, then the gas leaving the stack can already have a load of mist, in which case evaporation of the droplets as the plume becomes mixed with air can cool the plume and further reduce its buoyancy. A high degree of mist elimination should be achieved if no reheat is used. Moreover, very little NO_x (probably less than 15 percent) is removed in SO_2 scrubbing. Thus NO_x ambient concentration will be greatly increased unless the gas is reheated.

4.11.7 Analysis of Bypass Reheat

Bypass reheat should be analyzed to determine its applicability from the standpoint of the emission limitations for sulfur dioxide. Bypass reheat offers the advantages of low capital investment and simple operation. The maximum quantity of reheat that can be obtained, however, is limited by the constraints of pollutant emission standards. As mentioned earlier, a regulation requiring 90 percent SO_2 removal efficiency would completely rule out the bypass reheat option. ~~The limitation~~ of sulfur emission to meet the emission standard for sulfur dioxide of 1.2 lb/mill Btu can be written as:

(25% - 40%) 70%

$$X - 1 - \frac{1}{E} + \frac{1.2}{2WSE} \qquad \text{(Eq. 4.11-11)}$$

where,

W = amount of fuel required to generate one million Btu/lb

S = weight fraction of sulfur in the fuel

X = fraction of bypass flue gas stream

E = Fractional sulfur removal efficiency of the wet scrubbing system

For details of the heat balance around the reheat system, refer to Reference (1).

4.11.8 No Reheat

As mentioned previously, stack gas reheat is not required by law. Some power plants have selected, at least temporarily, a "no-reheat" design and accepted the possible consequences--condensation in the ID fan and the stack.

Wash water can be sprayed periodically on the ID fan blades to prevent solid deposits, and a wet stack can be installed to protect the stack from acid attack.

Some advocate "no-reheat" by utilizing a "slow" stack (gas velocity of 30 ft/s [9 m/s]) rather than a conventional stack (gas velocity of 90 ft/s [30 m/s]). The slow stack allows mist droplets (acid rain) to settle out in the stack bottom. This requires special duct and stack material and handling equipment. It also requires larger stacks, which increase opacity problems.

Another alternative for prevention of ground concentration of pollutants is to build a taller stack. A tall stack may be more economial than reheating, even though it involves a high capital cost. There is, by comparison, no energy cost. Under certain circumstances, however, a stack of the required height might not achieve the objective of dispersion for a particular location. Meteorological modeling is a useful tool for determining the validity of such an alternative, but most dispersion models have not been developed for wet plumes.

To limit corrosion in no-reheat operation, one may either select materials that are inherently resistant to corrosion, or use coatings to cover corrodible materials. Discussion of this issue is included elsewhere in this Data Book. If the purpose of reheat is to protect a downstream fan, an obvious alternative is to place a fan upstream from the scrubber. This solution is only feasible with an upstream collector or ESP to remove abrasive particulate. Most installations with wet stack operation have stack lining problems. The lining usually blisters and eventually

STACK GAS REHEAT FOR WET FLUE GAS DESULFURIZATION SYSTEMS

EPRI FP-361
(Research Project 209-2)

Final Report

February 1977

Prepared by

BATTELLE
Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

Principal Investigators
P. S. K. Choi
S. G. Bloom
H. S. Rosenberg
S. T. DiNovo

Prepared for

Electric Power Research Institute
3412 Hillview Avenue
Palo Alto, California 94304

Project Manager
Thomas Morasky

ABSTRACT

A major problem in operating wet flue gas desulfurization systems is the need for stack gas reheat. Reheat is required to avoid downstream condensation and corrosion, to avoid a visible plume, and to enhance plume rise and dispersion of residual pollutants. Reheat methods currently in use include in-line reheat, indirect hot air reheat, and direct combustion reheat. Bypass reheat is not currently in use but has been considered and tested.

In-line reheaters using steam, in general, encounter a severe corrosion problem, due mainly to stress corrosion caused by chloride. Neither carbon nor stainless steel is adequate to resist this corrosion. In-line carbon steel reheaters using hot water have less severe corrosion problems compared to steam in-line reheaters. The use of hot water may not be the reason for less corrosion. More likely, one of the reasons may be that the boiler systems incorporate a limestone injection process which may eliminate chloride and sulfate ions from the flue gas. Because of extended fins on the tubes, however, a heater of this type has more severe pluggage and soot-blowing problems.

Indirect hot air reheaters are free of corrosion and plugging problems. This type of reheater, also providing reduced moisture content in the stack gas, reduces the probability of fog formation in the plume.

The major problems associated with direct combustion reheaters are corrosion and flame instability. An external combustion chamber is desirable. The initial capital investment is low but the utility cost is high due to high cost of fuel.

Bypass reheat has the advantages of low capital investment and simple operation, but the maximum degree of reheat attainable is limited by pollutant standards.

CONCLUSIONS

Based on the results of the unit study on stack gas reheat for wet scrubbing, the following conclusions can be drawn.

(1) Power plant stack gases from wet scrubbers need to be reheated in order to avoid downstream condensation in the I.D. fan and stack, and to avoid a visible plume. A secondary reason for stack gas reheat is to improve plume rise and dispersion. The types of reheat systems currently being employed at power plants include in-line reheat, indirect hot air reheat, and direct combustion reheat.

(2) To minimize the heat requirement for a fixed degree of reheat, the mist carryover from the scrubber should be minimized. The efficiency of the scrubber mist eliminator should, therefore, be high and the time of operation of the top wash sprayer, if used, should be minimized. A high-efficiency mist eliminator also is necessary to avoid severe pluggage problems in in-line reheaters.

(3) The lowest heat requirement to avoid downstream condensation can be obtained by an in-line reheater. The lowest heat requirement to avoid a visible plume can be obtained by an indirect hot air reheater. An indirect hot air reheater also results in a higher plume rise and generally a lower ground-level pollutant concentration for a fixed degree of reheat because of the effect of stack gas dilution with air. However, in general, the effect of reheat on the effective control of ground-level sulfur dioxide concentration is small in the temperature ranges beyond the dewpoint of the stack gas.

(4) Bypass reheat, has the advantages of low capital investment and simple operation. However, the maximum degree of reheat which can be obtained is limited by the constraints of pollutant emission standards. The applicability of bypass reheat, for example, based on the limitation for sulfur dioxide emission depends on the sulfur content of the fuel, the removal efficiency of the scrubbing system, the temperature of the bypassed flue gas, and the degree of reheat required.

(5) The general consensus for reheat requirement is to increase the stack gas temperature from the wet scrubber and mist eliminator (about 125 F) by 25 F to 50 F. The energy need for reheat ranges between 1 to 5 percent of the total energy input to the boiler system. The energy need has a wide range because of variations in mode of operation, extent of duct insulation, arrangement of ductwork, and type of reheat.

(6) In-line reheaters using steam, in general, have a severe corrosion problem. The corrosion is mainly due to stress corrosion caused by chloride. Neither carbon steel nor stainless steel is deemed adequate to resist the corrosion. The solids deposited on the tubes should be blown off about once every 4 to 8 hours using either steam or compressed air. The soot blowing equipment is one of the high maintenance items.

(7) In-line, carbon steel reheaters using hot water have less corrosion problems compared with those for steam in-line reheaters during the first 6 to 7 years of operation. The tube temperature in general is low (about 230 to 350 F). Because of

extended fins, a reheater of this type has more severe pluggage and soot blowing problems. An efficient mist eliminator prior to the reheater is essential.

(8) In-line reheaters, either steam or hot water, have the advantages of being simple in design and low in capital investment. However, the reheaters require a large amount of maintenance for successful operation.

(9) Direct combustion reheaters with burners in-line have corrosion and flame stability problems. An external combustion chamber is desirable to cope with the problems. This type of reheat system is not deemed adequate for ducts with combustible linings since ineffective mixing of stack gas and combustion gas would cause downstream hot spots and damage the linings. In addition, the preheating time for the combustion chamber is high (about 8 to 15 hours) in order to prevent the refractory lining from cracking, and the temperature control is difficult. The initial investment is low, but the annual utility cost is very high compared with those for other reheat systems.

(10) Indirect hot air reheaters are free of corrosion and pluggage problems. This type of reheater also provides a decrease in moisture content per unit weight of dry gas, which will reduce the probability of fog formation in the plume. The initial capital investment is relatively high compared with that for other types of reheaters. However, the maintenance cost will probably be lower due to the absence of corrosion and pluggage problems.

(11) Startup and shutdown should be carried out with more attention to proper procedures. The procedures vary with the type of reheater, type of duct lining material, type of mist eliminator material, distance from the mist eliminator, and the type of materials used in

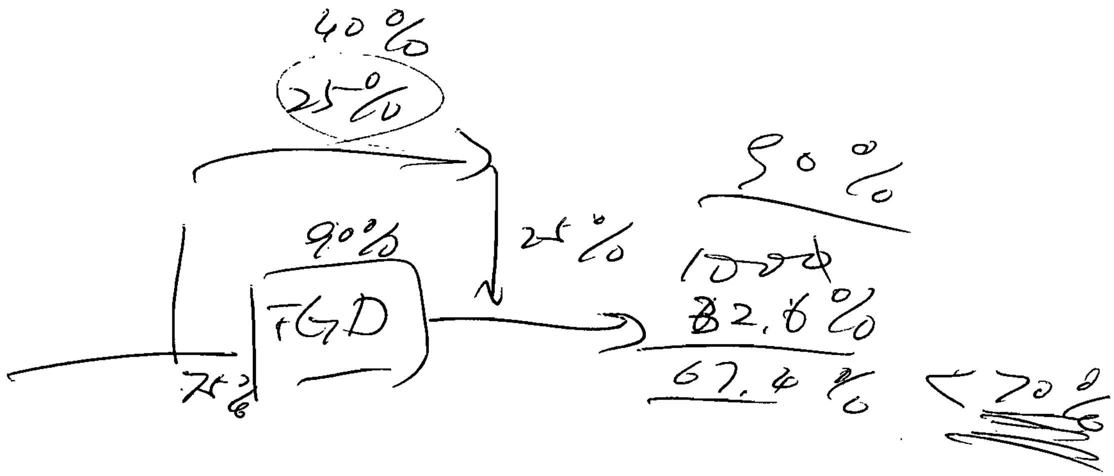
construction of the FGD system. Two important points to consider in the procedures are the prevention of corrosion in the reheater and the protection of structures from thermal damage.

(12) Stack gas that has not been reheated has a very dense, visible plume. The condensate in the stack has a pH of 2 to 4 according to the survey data and causes some deleterious effect on masonry linings. Operation without reheat requires washing I.D. fans to protect the fan blades from solid deposits, and an acid-resistant lining in the stack to protect the stack structure from deterioration.

RECOMMENDATIONS FOR FUTURE STUDY

(1) A detailed economic analysis of alternative reheat systems is recommended to analyze initial investment cost and cost for operation and maintenance. There has been a lack of systematically analyzed information on stack gas reheat, and thus, the selection of stack gas reheat in the scrubber installation has been mainly dependent upon the vendors supplying the scrubbing system. This occurs because the reheat system is usually included as a part of the scrubber package. However, this need not be the case and a utility should be free to select the optimal reheat system for its specific situation. In the proposed study, a representative case will be selected to use as a basis for the comparative analysis. Technical evaluations will be carried out for various reheat alternatives as well as the economic analysis. The results would provide the Electric Power Research Institute and its membership with a better basis for economic and technical analysis of various types of reheat systems.

(2) A study on plume rise and pollutant dispersion is also recommended for a wet plume to examine the effect of various parameters. In the present report, the effect of reheat was studied only for a specific case. The



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FGD
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67.4%
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State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

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TO: Buck Oven, Power Plant Siting Section

THRU: Steve Smallwood, Bureau of Air Quality Management

THRU: Clair Fancy, Central Air Permitting, BAQM

FROM: Bob King, Central Air Permitting, BAQM B/K

DATE: October 9, 1981

SUBJ: Jacksonville Electric Authority, SJRPP Units 1 and 2
Comments on Conditions of Draft Certification

1. The Bureau believes that the following conditions should be added to the Section 1.A. Emission Limitations:

   (a) The two auxiliary boilers shall fire No. 2 fuel oil with a maximum sulfur content of 0.76 percent by weight, a maximum ash content of 0.01 percent by weight, a minimum heating value of 19,170 Btu per pound and a maximum viscosity of 3.0 centistokes at 100 ^{o}F. Samples of all fuel oil fired in the boilers shall be taken and analyzed for sulfur content, ash content, heating value and viscosity. Accordingly, samples shall be taken of each fuel oil shipment received. Records of the analyses shall be kept a minimum of the two years to be available for FDER's inspection.

   (b) The same quality No. 2 fuel oil, used for the auxiliary boilers, shall be used for the main boilers Units 1 and 2 during start-up and low load operation.

   (c) Maximum emissions from either of the auxiliary boilers shall be limited to 0.8 lb/MMBTU for SO_2, 0.3 lb/MMBTU for NO_x, 0.01 lb/MMBTU for PM, and 10 percent opacity for visible emissions.

   (d) Coal fired in Units 1 and 2 shall have an ash content not to exceed 18% and a sulfur content not to exceed 4% by weight. Coal sulfur content shall be determined and recorded in accordance with 40 CFR 60.47a.

(e) No fraction of flue gas shall be allowed to bypass the FGD system to reheat the gases existing from the FGD system, if the bypass will cause overall SO_2 removal efficiency less than 90 percent. The percentage and amount of flue gas bypassing the FGD system shall be documented and records kept a minimum of two years available for FDER's inspection.

(f) Neither of the auxiliary boilers shall be allowed to operate while the boiler Units 1 and 2 are operating collectively at greater than 6,144 million Btu per hour heat input.

2. The Bureau objects to using 20% opacity in Subsection I.A.3.a. for coal handling facilities. The 20% opacity limit for visible emissions from coal handling facilities is too lenient in comparison with the visible emission limits addressed in EPA's PSD permit. The Bureau proposes using 10% opacity limit for controlling visible emissions from the coal handling facilities.

3. The heat input values of 4,330 and 4,458 MMBTU/hr addressed in Subsections I.A.1 and I.C.1, respectively, are questionable. Based on our understanding, each main unit has 6,144 MMBTU/hr maximum heat input rate. Please check latest information from the applicant on this matter.

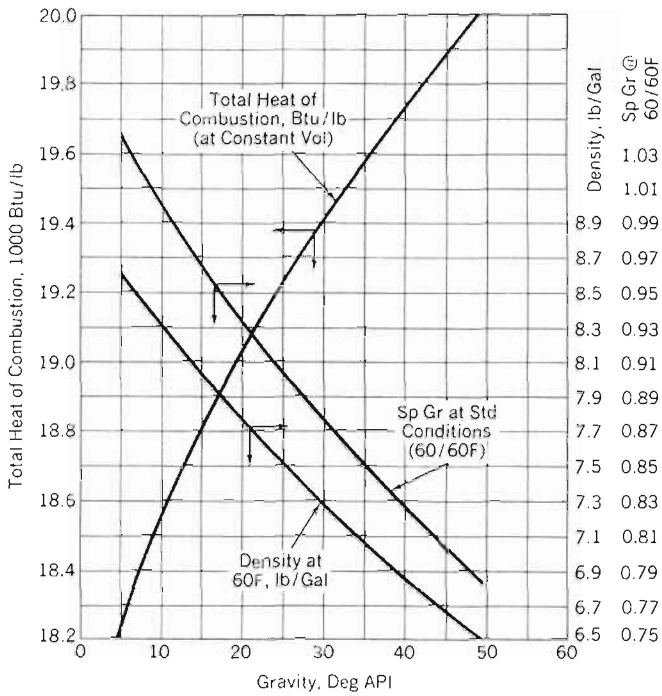
BK:caa

given in Fig. 7 for converting known volumes at other temperatures to the 60F standard base. This correction is also dependent on the API (American Petroleum Institute) gravity range as illustrated by the three parametric curves of Fig. 7.

Since handling and especially burning equipment is usually designed for a maximum oil viscosity, it is necessary to know the viscosity characteristics of the fuel oil to be used. If the viscosities of heavy oils are known at two temperatures, viscosities at other temperatures can be closely predicted with negligible error by a linear interpolation between these two values located on the standard ASTM chart of Fig. 8. Viscosity variations with temperature for certain light oils can also be found with the aid of the ASTM chart but in this case knowledge of the viscosity at only one temperature is required. Viscosities of light oils at various temperatures within the region designated as No. 2 fuel oil can be found by drawing a line parallel to the No. 2 boundary lines through the point of known viscosity and temperature. Copies of the chart may be obtained from the ASTM.

Compared with coal, fuel oils are relatively easy to handle and burn. Heating is not required for the lighter oils, and even the heavier oils are relatively simple to handle. There is not as much ash-in-bulk disposal problem as there is with coal, and the amount of ash discharged from the stack is correspondingly small. In most oil burners the oil is atomized to a mist of small particles that mix with combustion air. In the atomized state, the characteristics of oil approaches those of a gas, with consequent similar explosion hazards (*see Safety Precautions, Chapter 7*).

Because of its relatively low cost compared with that of lighter oils, No. 6 fuel oil is the most widely used for steam generation. It can be considered a by-product of the refining process. Its ash content ranges from about 0.01 to 0.5%, which is very low compared with coal. However, despite this low percentage content, ash containing compounds of vanadium, sodium and sulfur can be responsible for a number of serious operating problems (Chapter 15).



$$\text{Deg API} = \frac{141.5}{\text{Sp Gr @ 60/60F}} - 131.5$$

Fig. 6 Heating value, weight (lb per gal), and specific gravity of fuel oil for a range of API gravities.

Table 26
Range of analyses of fuel oils

Grade of Fuel Oil	No. 1	No. 2	No. 4	No. 5	No. 6
Weight, percent					
Sulfur	0.01-0.5	0.05-1.0	0.2-2.0	0.5-3.0	0.7-3.5
Hydrogen	13.3-14.1	11.8-13.9	(10.6-13.0)°	(10.5-12.0)°	(9.5-12.0)°
Carbon	85.9-86.7	86.1-88.2	(86.5-89.2)°	(86.5-89.2)°	(86.5-90.2)°
Nitrogen	Nil-0.1	Nil-0.1	—	—	—
Oxygen	—	—	—	—	—
Ash	—	—	0-0.1	0-0.1	0.01-0.5
Gravity					
Deg API	40-44	28-40	15-30	14-22	7-22
Specific	0.825-0.806	0.887-0.825	0.966-0.876	0.972-0.922	1.022-0.922
Lb per gal	6.87-6.71	7.39-6.87	8.04-7.30	8.10-7.68	8.51-7.68
Pour point, F	0 to −50	0 to −40	−10 to +50	−10 to +80	+15 to +85
Viscosity					
Centistokes @ 100F	1.4-2.2	1.9-3.0	10.5-65	65-200	260-750
SUS @ 100F	—	32-38	60-300	—	—
SSF @ 122F	—	—	—	20-40	45-300
Water & sediment, vol %	—	0-0.1	tr to 1.0	0.05-1.0	0.05-2.0
Heating value					
Btu per lb, gross (calculated)	19,670-19,860	19,170-19,750	18,280-19,400	18,100-19,020	17,410-18,990

° Estimated.

Calorific value of coal

The calorific or heating value of coal is determined accurately in an oxygen bomb submerged in cooling water. Several acceptable makes or types of bomb calorimeters are listed in ASTM Standard D 271. A pulverized coal sample is compressed into a hard pellet and ignited in an oxygen atmosphere with a hot wire. The heating value is then determined from the rise in water temperature.

Gross (higher) heating value is defined as the heat released from combustion of unit fuel quantity (mass), with the products in the form of ash, gaseous CO_2, SO_2, N_2, and liquid water exclusive of any water added directly as vapor. The net (lower) heating value is calculated from the gross heating value as the heat produced by a unit quantity of fuel when all water in the products remains as vapor. This calculation (ASTM Standard D 407) is made by deducting 1030* Btu/lb of water derived from the fuel, including both the water originally present as moisture and that formed by combustion. In America the gross calorific value is commonly used in heat balance calculations, while in Europe the net value is generally used.

Grindability of coal

Grindability is a term used to measure the ease of pulverizing a coal in comparison with a standard coal chosen as 100 grindability. For a description of the method of testing to determine grindability of a coal, see "Grindability Index (ASTM D 409)," Chapter 9. Fig. 6 of the same chapter shows the machine used in making the test. The grindability of the 17 representative coals in Table 17 is tabulated in the last column of Table 22.

Free-swelling index

The ASTM Standard Method D 720 is used for obtaining information regarding the free-swelling property of a coal. Since it is a measure of the behavior of rapidly heated coal, it may be used as an indication of the caking characteristics of coal burned as a fuel.

Coal ash

The nature, composition, and properties of coal ash are discussed in Chapter 15.

Characteristics of fuel oil

It is common practice in refining petroleum to produce fuel oils complying with several specifications prepared by the ASTM and adopted as a commercial standard by the U.S. Bureau of Standards. These standards have been revised several times in order to meet changes in supply and demand and further changes may be expected.

The current standards are tabulated in Table 24. Fuel oils are graded according to gravity and viscosity, the lightest being No. 1 and the heaviest No. 6. Grades 5 and 6 generally require heating for satisfactory pumping and burning (*see Oil Burners, Chapter 7*). Analyses and relative cost of some selected fuel oils are listed in Table 25. The range of analyses and heating values of the several grades of fuel oils are given in Table 26.

The gross heating values of various fuel oils of different gravity are shown in Fig. 6. The abscissa on this figure is the API (American Petroleum Institute) gravity. Degrees API refer to a hydrometer scale with the following relation to specific gravity:

$$\text{(13)} \qquad \text{Degrees API} = \frac{141.5}{\text{sp gr @ 60/60F}} - 131.5$$

where:

sp gr @ 60/60F represents the ratio of oil density at 60F to water density also at 60F.

The heating values, as listed in Fig. 6, are closely related to the gravity of the oil. The heating value for an actual oil is obtained by correcting the Btu/lb value from Fig. 6 as follows:

$$\text{(14)} \qquad \frac{\text{Btu/lb} \times [100 - (A + M + S)]}{100} + 40.5\,S$$

where:

Btu/lb is taken from Fig. 6
A = % by wt of ash
M = % by wt of water
S = % by wt of sulfur

The volume percentages of water and sediment can be used without appreciable error in place of weight percentage where the percentages by weight of water and ash are not known.

Fuel oils are generally sold on a volume basis with 60F as the base temperature. Correction factors are

Table 25
Selected analyses and relative cost of fuel oils

Grade of Fuel Oil	No. 1	No. 2	No. 4	No. 5	No. 6
Weight, percent					
Sulfur	0.1	0.3	0.8	1.0	2.3
Hydrogen	13.8	12.5	—	—	9.7
Carbon	86.1	87.2	—	—	85.6
Nitrogen	—	0.02	—	—	2.0
Oxygen	Nil	Nil	—	—	
Ash	Nil	Nil	0.03	0.03	0.12
Gravity					
Deg API	42	32	20	19	—
Specific	0.815	0.865	0.934	0.940	—
Lb per gal	6.79	7.21	7.78	7.83	—
Pour point, F	−35	−5	+20	+30	—
Viscosity					
Centistokes @ 100F	1.8	2.4	27.5	130	—
SUS @ 100F	—	34	130	—	—
SSF @ 122F	—	—	—	30	—
Water & sediment, vol %	Nil	Nil	0.2	0.3	0.74
Heating value Btu per lb, gross	19,810	19,430	18,860	18,760	18,300*
Relative cost per Btu	118	100	76	60	51

* Bomb calorimeter determination.

* The value of 1030 Btu/lb of water, an average figure, corrects for both the latent heat of vaporization and conversion from constant volume conditions of the calorimeter to an equivalent constant pressure basis.

Jacksonville Electric Authority

233 WEST DUVAL STREET • P. O. BOX 53015 • JACKSONVILLE, FLORIDA 32201

August 11, 1981

RECEIVED
AUG 17 1981
DIV. ENVIRONMENTAL PERMITTING

Mr. Hamilton S. Oven, Jr., Administrator
Power Plant Siting Section
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Oven:

Subject: JACKSONVILLE ELECTRIC AUTHORITY
ST. JOHNS RIVER POWER PARK UNITS 1 & 2
BACT DETERMINATION

Attached please find copies of recent correspondence with EPA Region IV regarding Jacksonville Electric Authority's (JEA) Prevention of Significant Deterioration (PSD) application. This correspondence (including a letter from EPA to JEA dated 4/23/81, a letter from JEA to EPA dated 7/30/81 responding to EPA's letter, and a letter from JEA to EPA dated 7/31/81 providing comments on EPA's Draft Revised Preliminary Determination), is provided for your information since it relates in part to Best Available Control Technology (BACT).

We have reviewed FDER's BACT Determination for the subject project, signed by V. Tschinkel on 5/7/81, and have the following comments:

1. A CO emission limitation of 0.05 lb/MMBtu is indicated in the BACT Determination. The boiler vendor for the project has indicated that this emission rate cannot be guaranteed. JEA's position is that boiler design and combustion control practices to minimize CO emissions represents BACT; a specific emission limitation as a condition of the permit is not feasible since a guaranteed CO emission rate is not available from the boiler vendor. Sec. 3.8.2.6

2. The BACT Determination indicates that the auxiliary boiler will operate only when one of the main units is not in operation. JEA's position is that the emissions from the auxiliary boilers will be so small in comparison with the main units that no conditions regarding specific times for their operation are appropriate. Also, please note that, as indicated in the attached

/CONT.

DEPARTMENT OF ENVIRONMENTAL REGULATION

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2.	INITIAL DATE
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For your review and comment

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127
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FROM: Bob King

DATE 9/10/81

PHONE

correspondence, plans for auxiliary steam have recently been revised. Current plans call for two - 127 MMBtu/hr auxiliary boilers rather than the single 200 MMBtu/hr unit previously described. This change will not have a significant impact on annual emissions nor on ambient air quality.

These comments are virtually the same as those provided to EPA regarding their Draft Revised Preliminary Determination. Should you have any questions on these comments or the attached material, don't hesitate to call.

Sincerely,

Dale Moehle

Dale A. Moehle
Division Chief
New Generation Project

DAM/lwr

cc: R. Lyles - w/o attachments
R. Breitmoser - w/o attachments
D. Lucas - w/o attachments
L. Leskovjan - w/o attachments

Attachments: As Noted

cc Bill Thomas
Don Kell

RECEIVED
APR 27 1981
DIV. ENVIRONMENTAL PERMITTING

Post Office Box 236
Ft. George Island, Florida 32226
April 16, 1981

APR 1981 RECEIVED

Re: JEA/Eastport Site Evaluation

Gentlemen:

In regard to environmental issues or questions which would seem to need further identification, quantification, etc.; I would like to raise the following items to be more adequately addressed in any E.I.S. prepared by and/or for the proposed new coal-fired electric plants to be constructed at the Eastport Site, Duval County, Florida, by Jacksonville Electric Authority.

1. Climatic data needs to be collected "on-site", and for a long enough period of time to permit forecasting of potential air flow and odor particulate deposition patterns (including chlorides). WILL TAKE 1+YEAR TO COLLECT

   a) Odor - particulate disposition "footprints" under various seasonal weather conditions should be identified to the public along with the type of particulate, concentration expected (hourly, seasonally, annually and long-term), and the effect of such a deposition on the health and environment of Jacksonville. Such a study should include differences that may occur between nocturnal and daytime rates and patterns. CONC. CONSTANT (FLOW VARIES) STUDY WORST CASE only

   b) Such a study should include not only surface wind and weather conditions, but those at a height expected for the various ~~emmitens~~ emitters of such pollution. IN MODEL

   c) The study should include the effects, if any, that may occur as a result of these aerially transmitted pollutants mixing with already existing materials; under what weather conditions and with what possible effect, as well as where in the City of Jacksonville this is most likely to occur. VOC/NOx O3 CAN'T PREDICT

   d) The effect of the pollutants individually and collectively as they are deposited on currently existing and proposed main transmission lines as well as other lines (arcing, corrosiveness, etc.), and to include the economic costs of such effect. NEVER BEEN DONE

   e) The hazard, health, and economic costs of any "fog" produced; where, under what climatic conditions, frequency expected, length of time such hazard would exist on any particular roadway under usual weather conditions. IF NO STD VIOLATED, NO PROBLEMS

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP	ACTION NO.
	ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION)	INITIAL	
~~Bill Thomas, Suite 600~~ BT	DATE	4/27/81
2.	INITIAL	
Willard Hanks	DATE	
3.	INITIAL	
Bob King	DATE	
4.	INITIAL	
	DATE	

REMARKS:

INFORMATION	
	REVIEW & RETURN
	REVIEW & FILE
	INITIAL & FORWARD

DISPOSITION	
	REVIEW & RESPOND
	PREPARE RESPONSE
	FOR MY SIGNATURE
	FOR YOUR SIGNATURE
	LET'S DISCUSS
	SET UP MEETING
	INVESTIGATE & REPT
	INITIAL & FORWARD
	DISTRIBUTE
	CONCURRENCE
	FOR PROCESSING
	INITIAL & RETURN

FROM:	DATE
Buck Oven	4/27/81
	PHONE

2. Chloride deposition from the river water cooling tower emissions.

SALT IN AIR SPRAY FROM TOWER WILL BE PROBLEM IF IT GETS OFF Co. property.

   a) "Fall-out" patterns identified for weather conditions identified in above studies, to include: specific on-ground locations, expected concentration and deposition rates adjusted to diurnal and seasonal weather conditions.

   b) Expected build-up of these pollutants on different forms of vegetation, structures, and surface soil particles under expected weather conditions; as well as under prolonged drought conditions.

   c) The effects (including economic loss) of such chloride deposition under the identified climatic parameters.

3. Soils suitability at the selected site for intended uses.

H_2O

   a) There are eight (8) major soil units identified within the proposed site in the Soil Survey of the City of Jacksonville, recently completed by scientists in this area of study. Each of these soils has been identified and evaluated by soil scientists for various uses including ratings that reflect the ease of overcoming various identified soil limitations and the probability of soil problems persisting after such practices are used.

   b) Ratings of use-hazard range from slight to severe. For the intended uses identified by JEA, these 8 soils are rated largely as severe in use-hazard.

   c) Specific location of the various planned facilities, their specific soils, the distance from marsh, wetlands, and estuarine waters should be made.

   d) Ground-water percolation tests, particularly for the coal storage area and the waste-ponds, should be made. Such tests should include lateral soil water movement, particularly gradients toward the marsh and estuarine areas.

   e) Casual, as well as "worst-case", restraining area rupture of pond perimeters (including bottom) effects need to be identified: including health, environmental, and economic costs of clean-up of such a rupture.

   f) Continuous monitoring of storage areas should be specifically identified as to method, costs, frequency, detection ability, and etc., (including bottoms of storage areas).

4. Specific answers to questions concerning the main transportation route of the coal.

   a) Numbers of trains and all cars expected on a daily, weekly, and annual basis (incoming and outgoing combined).

   b) Exact route from railroad main line these trains will take through the Northside area.

   c) Times of day/night the trains will be potentially increasing pollution and blocking access roads.

   d) Lenght of time specific roadways will be blocked in addition to current blockage.

   e) Routes emergency traffic will have to use as an alternative due to road blockage.

   f) Costs of re-routing and/or over-passing vehicular traffic due to increased train traffic.

   g) Number and economic loss expected from railroad caused fires in rural areas.

   h) Location, amount, and type of additional pollution in rural and residential Northside area due to increased train traffic.

I am sure there are more areas to be identified but this compilation of potential health, environmental, and economic problems that may be caused at this particular site indicate the urgency of the problem and the little information currently available to the affected public.

Thank you for your attention to these matters.

Sincerely,

Robert D. Sage

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee	
To: Bob King	Loctn.:
To:	Loctn.:
To:	Loctn.:
From:	Date:
Reply Optional [ ] Reply Required [ ]	Info. Only [ ]
Date Due:	Date Due:

APR 1981 RECEIVED

TO: Buck Oven, Power Plant Siting Section

THRU: Bill Thomas BT, Bureau of Air Quality Management

THRU: Willard Hanks WMH

FROM: Bob King BK

DATE: April 17, 1981

SUBJ: Comments on Sufficiency Review - JEA's St. Johns River Power Park Unit 1 and Unit 2.

DIV. ENVIRONMENTAL PERMITTING

See PSD Report

also amendments

1. Did JEA conduct any on-site monitoring program at Northside Site before or after the construction of Northside Unit 3? If JEA did, send us the results of the monitoring program. See Section 6.2.6

2. According to the application (page 2.7-7), EPA Region IV approved the use of on-site monitoring data for baseline/background determination. We need confirmation of this approval.

3. What are the maximum sulfur dioxide and particulate matter emission rates when burning No. 2 fuel oil during start-up and low load operation of Unit 1 and 2?

4. According to the application (page 3.8-6), a small fraction of flue gas will bypass the absorbers to reheat the gases exiting the absorbers. What is maximum flow rate of the bypassing flue gas? What is the overall SO_2 removal efficiency including bypassed flue gas of the system? See chapter 5.5.4

5. Cooling towers are subject to both BACT and PSD requirements. Ambient particulate concentrations and drift impacts must be included in the application. See table F-1

6. If maximum cooling tower drift is 1.5 percent of the circulating water, what is the particulate matter emission rate for each tower? 0.002% — See PSD Application 4.7.5

7. What is maximum particulate matter emission rate in lb/hr and tons/yr from auxiliary boiler? — See Section 3.6 of the PSD application also table 5-1 of PSD

BK:BT:WH:dav

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION) Bob King Air Quality	INITIAL	DATE
2.	INITIAL	DATE
3.	INITIAL	DATE
4.	INITIAL	DATE

REMARKS:

Please check the sections noted and resubmit if you are not satisfied I will pass on questions 2 – 4 to EBASCO

INFORMATION

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DISPOSITION

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- CONCURRENCE
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FROM: Buck Oven

DATE 4/20

PHONE

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee		
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To:	Loctn.:	
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From:	Date:	
Reply Optional [ ]	Reply Required [ ]	Info. Only [ ]
Date Due:	Date Due:	

TO: Steve Pace, Jacksonville Bio-Environmental Services
Johnny Cole, DER St. Johns River Subdistrict
Bob King, DER BAQM

FROM: Edward Palagyi, BACT Coordinator BAQM EP

DATE: April 9, 1981

SUBJ: BACT Recommendation - Jacksonville Electric Authority

Attached is a partially completed BACT determination for the subject facility. Your recommended BACT determination and justification for the facility would be appreciated. Feel free to comment on the completed portion as well.

Your reply by April 24, 1981, will be appreciated.

EP:dav

Best Available Control Technology (BACT) Determination

Jacksonville Electric Authority

Duval County

The proposed facility is the construction of two 600 megawatt coal-fired electric utility steam generating units to be located in Jacksonville, Florida. The units will be designed for possible conversion to oil, gas or refuse firing. There will be an auxiliary boiler rated at 200 million Btu/hr estimated to have an annual capacity factor of 5 percent compared to 74 percent for the two units.

The plant will be located in Duval County which is classified nonattainment for the pollutant Ozone (17-2.16(1)(c) F.A.C.). It will be located in the area of influence of the Jacksonville particulate nonattainment area (17-2.13(1)(b) F.A.C.), however, the plant will not significantly impact the nonattainment area and is therefore exempt from the requirements of Section 17-2, 17&18&19 with respect to particulate emissions. The facility must comply with the provisions of 17-2.04 F.A.C. (Prevention of Significant Deterioration).

BACT Determination Requested by the Applicant:

Pollutant	Emission Limit
Particulates	0.03 lb/million Btu input
SO_2	0.76 lb/million Btu input
NO_x	0.60 lb/million Btu input
CO	0.05 lb/million Btu input

Particulate emissions to be controlled using an Electrostatic Precipitator (ESP). SO_2 emissions to be controlled with a limestone wet scrubbing system. There is no specific control technology for control of NO_x and CO emissions. BACT to be manufacturer's guarantee for state-of-the-art burner design parameters to minimize emissions.

Flyash emissions to be controlled using a pneumatic transfer system and bottom ash using a wet thansfer system. Emissions from coal and limestone handling to be controlled by use of enclosed conveying systems with baghouses rated at 99.9 percent efficiency. Water suppression to control dust to be used as required.

<u>Date of Receipt of a Complete BACT Application:</u>

February 27, 1981

<u>Date of Publication in the Florida Administrative Weekly:</u>

March 27, 1981

<u>BACT Determination and Justification by DER:</u>

(Your Response)

III. COMMENTS ON DRAFT CONDITIONS OF CERTIFICATION

Page 2, Condition 5

Issue: Visible emissions from the (a) limestone and flyash handling system, (b) limestone day silos, and (c) flyash silos are limited to 5% opacity.

Resolution: The opacity limitation should be changed to 10% to be consistent with the conditions in the PSD preliminary determination.

disagree 10% is not consistent with revised PSD preliminary determination

Page 2, Condition 9

Issue: Contains a typo.

Resolution: Insert a comma after "contractors."

Page 3, Condition 10

Issue: Contains a typo.

Resolution: Change CRF to CFR.

Page 2, Condition 11

Issue: The minimum heating value of the oil which can be fired in the auxiliary boilers is specified.

Resolution: Change the words "a minimum heating value of 19,170 Btu per pound" to "an approximate heating value of 19,500 Btu per pound." The heating value of No. 2 fuel oil varies somewhat from shipment to shipment and it seems unnecessary to specify an exact minimum value. Also, this change will make the condition consistent with a similar condition in the PSD preliminary determination.

O.K.

~~disagree~~

~~Heating value for No. 2 fuel oil varies from 19,170 Btu/lb to 19,750 Btu/lb.~~

Page 2, Condition 11

Issue: The maximum viscosity of the fuel oil is set at 3.0 centistokes at 100°F.

3.6

Resolution: This value should be changed to 3.6 centistokes at 100°F per ASTM fuel specification D-396.

agree

Page 3, Condition 13

Issue: The maximum allowable emissions from the auxiliary boilers are specified.

Resolution: Since BACT has been defined as the use of low sulfur and low ash fuel (Condition 11), since the potential auxiliary boiler vendors will not guarantee specific emission rates, and

why do they object to limits?

since the boilers will operate only approximately 5% of the time, we feel it is inappropriate to have specific numerical emission limitations for the auxiliary boilers. Therefore, the condition should be eliminated.

Page 3, Condition 15

Issue: No flue gas bypass will be allowed if overall SO_2 removal efficiency would drop below 90 percent.

Resolution: The 90 percent figure should be changed to 70 percent to be consistent with the federal New Source Performance Standards which allow a lower removal efficiency when SO_2 emissions are less than 0.6 lbs/MMBtu.

disagree

The SO_2 emission limit is 0.76 lb/MMBtu, which is subject to 90% removal. See attachment to explain.

Page 3, Condition 15

Issue: Misspelled word.

Resolution: "Exiting" for "existing."

Page 3, Condition 16

Issue: The auxiliary boilers shall not be operated when the main units are operating in aggregate at greater than 50 percent load.

Resolution: This condition should be eliminated entirely because the emissions from the auxiliary boilers are so small in comparison with the emissions from the main units and they will be operated so infrequently that no conditions regarding specific operating restrictions are appropriate. This position was stated to EPA and was supported with a screening analysis of auxiliary boiler impacts. EPA subsequently removed operating restrictions on the auxiliary boilers from the PSD Preliminary Determination. Thus, to be consistent with the PSD Preliminary Determination, this condition should be removed.

agree

~~The function of auxiliary boiler is for start-up use, If both main units already start up, the auxiliary boiler should not be used.~~

Page 4, Condition I.B.4

Issue: With respect to the stack sampling facilities, the sampling probe liner shall be fabricated of material which can withstand flexing.

Resolution: The second sentence of this condition, which deals with the material requirement, should be eliminated. The material used should be the prerogative of the applicant, so long as the provisions of Rule 17-2.700(4) FAC are met.

Page 4, Condition I.B.5

Issue: Purpose of review is not clear.

Resolution: Modify to read "The ambient monitoring program may be reviewed to determine appropriate modifications by the Department and the permittee beginning three years after startup of Unit 1. Modifications shall be effected in accordance with the provisions of Section XXV."

Page 4, Condition I.B.6

Issue: The type of operation is not clear.

Resolution: Insert the word "commercial" before the word "operation" in the first line of the condition.

Page 4, Condition I.C.1

Issue: Performance test results are required within 30 days of completion.

Resolution: This should be changed to 45 days to be consistent with the EPA PSD Preliminary Determination, and to allow adequate time for report preparation.

activities in the area. When current and future JEA spoil disposal activities are completed, Least terns could resume nesting in the spoil areas provided that dredge spoils are not deleterious to this species.

Nesting Least terns and their eggs were observed at three remote sites on Blount Island in areas characterized by sparse vegetation. A decline in suitable tern nesting sites has prompted the Florida Game and Fresh Water Fish Commission to list the Least tern as threatened. Man-made spoil banks are now important nesting areas for this bird and help offset the loss of much of the tern's natural nesting habitat. Several studies have indicated that birds nesting in areas containing toxic constituents suffer from lower reproductive rates than avifauna inhabiting "cleaner" areas. It has also been reported that biomagnification of potentially toxic trace elements occurs in avian food webs. However, it is not known how the toxic compounds (which are present in St. John's River dredge spoil) will affect reproductive and feeding activities of tern and other avian species and future studies could be required.

Of the species found on Blount Island only the Endangered wood stork is seen as possessing unique ecological value. None of the island's fauna are considered to be commercially or recreationally important.

VI. FACILITY SPECIFIC CONCERNS

A. Air Quality

1. Selected Fuel

The units are planned for coal-fired operation; however, provisions are being made in the design to allow for possible conversion to oil,

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO.	
ACTION DUE DATE	

TO: (NAME, OFFICE, LOCATION)	
1. Bob	INITIAL DATE
2.	INITIAL DATE
3.	INITIAL DATE
4.	INITIAL DATE

REMARKS:

This is a copy of the air quality portion of JEA SJRPP site certification.

INFORMATION
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DISPOSITION
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- INITIAL & RETURN

FROM: Tom

DATE

PHONE

gas or refuse firing. Based on a study of availability of coal, east of the Mississippi River, there are practical sources of coal adequate to meet the plant's needs over the anticipated life of the project (approximately 3,500,000 tons per year). The JEA coal availability study has identified coal supplies in Tennessee, Kentucky, and Ohio as the most likely sources. In addition, partial supplies could be obtained from several foreign sources.

The plant is designed to retain the flexibility to change its coal supply (to insure against disruptions in supply, local market upsets and to maintain competitive prices) with minimum reduction in efficiency and without violating air quality standards. Analyses of potential coal supplies were therefore necessary so that the plant could be designed to accomodate coals with a variety of characteristics. Coals from the above sources were analyzed to determine the ranges of characteristics and chemical constituents.

The air quality control system is designed on a "worst case" basis assuming the maximum sulfur (4 percent) and ash (18 percent) in the coal and a minimum heating value (10,500 Btu/lb). This approach assumes the sulfur and ash contents of the coal are 3.8 lb/MMBtu (Million Btu) and 17.1 lb/MMBtu, respectively. The ash remaining after the coal is burned is assumed to be 80 percent fly ash and 20 percent bottom ash. The above values were used to develop collection equipment efficiencies, investment estimates and long and short-term ground level ambient air quality concentrations. This approach requires a more sophisticated, complex, efficient and costly air quality control system than would be required on the basis of average coal characteristics.

It is proposed that the steam generator will burn No. 2 fuel oil for light-off and flame stabilization during start-up and low load operation. This light oil will be stored on site and pumped to the steam generator as required. Approximately 1,000,000 gal/yr will be utilized on an intermittent basis, which represents less than 2 percent (by heat input) of the steam generator annual fuel consumption. The fuel oil is expected to have a maximum sulfur content of 0.76 percent by weight, a maximum ash content of 0.01 percent by weight, and a heating value of 19,000 Btu/lb. Since the pollutant contents are so low and the utilization of oil so limited, the emissions of particulates and SO_2 from oil burning are considered by JEA to be insignificant when compared to those from coal burning.

The coal handling system will provide for delivery of coal by ocean vessel to a marine terminal on Blount Island with shuttle train delivery to the plant, as well as rail delivery directly to the plant by unit train or in trainload lots. A rotary car dumper will be used to unload coal from the trains on the power plant site proper. The system will also include the yard area coal storage, transfer system, coal silos, and the tripper floor distribution system.

2. Air Quality Impacts

The air quality in the area of the JEA site is currently affected by emissions from the St. Regis and Alton Box Board paper mills, the Celotex wall board plant and JEA's existing power plants. The air quality in the area will also be impacted by the construction and operation of the JEA SJRPP.

The emission of air pollutants from the JEA site are limited by Chapter 17-2, FAC, and by the New Source Performance Standards as imposed by the U.S. Environmental Protection Agency. In order to comply with these regulations, JEA plans to utilize washed coal with electrostatic precipitators to control emission of fly ash and a wet limestone scrubber to control emission of sulfur oxides. Nitrogen oxides emissions will be controlled by boiler design.

When both of the units are operating at 100% of rated capacity, the plant will consume 1129 tons per hour of coal and will emit 9034 pounds per hour of SO_2, 356 pounds per hour of particulates, and 7114 pounds per hour of nitrogen oxides.

The stack height of 640 feet will assist the control equipment in reducing ambient air quality impacts. Only during rate meteorological conditions will stack emissions reach the ground close to the plant. The stack height insures dispersion and dilution of air pollutants before the pollutants reach ground level at some distance from the site.

Air quality impacts are shown on Table 1. The computerized dispersion models used by JEA to predict ambient air quality impacts indicate no violations of ambient air quality standards.

The department has reviewed the models JEA used to predict air quality impacts and the inputs to those models. In verifying the JEA results the department has found a predicted violation of the Florida Ambient Air Quality Standard (FAAQS) for SO_2 on a 24-hour average. We have also found certain discrepancies in the modeling assumptions input data (e.g., emission rates and mixing heights) used in the analysis but are satisfied that all other FAAQS's and PDS increments will be complied with.

The violation of the State SO_2 standard is associated with the three other JEA power plants, Northside, Kennedy, and Southside. These three plants, along with the proposed new plant, are geographically aligned along a roughly northeast to southwest orientation. This causes a maximum interaction of emissions from these facilities to occur when winds blow parallel to this direction. The predicted violation occurs downwind (i.e., southwest) of the Southside facility.

JEA has addressed this case of alignment of the four power plants and has concluded that no violation will occur. This conclusion is based on modeling in which the stack heights at the Kennedy and Southside facilities are raised to 84 m. Pursuant to Executive Order No. 79-67, signed by Governor Bob Graham on August 31, 1979, JEA is required to raise the stacks of the Kennedy and Southside facilities. However, JEA is now asking the Department to reexamine (and rescind) the stack height requirements of the Governor's Executive Order due to significant changes in the utility's future operating plans.

Because the actual stack heights at the Southside and Kennedy plants are considerably lower than those used by JEA in their air quality analysis, we remodeled this case. The results show a predicted 24-hour ground level SO_2 concentration of 263.3 ug/m^3 occurring approximately 2.5 kilometers to the southwest of the Southside facility. (The FAAQS is 260 ug/m^3). The proposed SJRPP facility contributes 8.7 ug/m^3 to the predicted violation. It should be noted that only the four JEA power plants were modeled, and the addition of a background value for SO_2 would further increase the magnitude of the violation.

Unless an alternative proposal for the use of the Kennedy and/or Southside facilities is submitted, taller stacks at those facilities may have to be made a condition of certification of the SJRPP facility. Until these issues are resolved, we are unable to approve the air quality analysis portion of the SJRPP application.

TABLE 1

Maximum Predicted Ambient Air Quality Impacts

($\mu g/m^3$)

Prevention of Significant Deterioration

Pollutant and Source	Annual Avg.	24 Hour Avg.	3 Hour Avg.
SO_2: Plant Only	13	207	1298
Plant & Existing Sources	2	52	410
(Ambient Standards)	60	260	1300
(PSD Increment)	20	91	512
Particulates: Plant Only	3	33	N/A
Plant & Existing Sources	2	28	N/A
(Ambient Standards)	60	150	N/A
(PSD Increment)	19	37	N/A
NO_x: Plant Only	10		N/A
Plant & Existing Sources			
(Ambient Standards)	100		N/A

3. Prevention of Significant Deterioration

Pursuant to Chapter 17-2, FAC, and 40 CFR 52.21, the SJRPP Units 1 and 2 are subject to a review for the Prevention of Significant Deterioration (PSD) of air quality. The Clean Air Act Amendments of 1977 prescribe incremental limitations on the air quality impacts of a new source. Table 1 summarized maximum air quality impacts from the proposed construction of Unit 1 and 2 and all other increment consuming sources in the vicinity of the SSJRPP Site. The Department of Environmental Regulation has reviewed the PSD analysis submitted by JEA and has found that the construction of Units 1 and 2 should not violate state PSD regulations as contained in Section 17-204, FAC.

Additionally, the U. S. Environmental Protection Agency Preliminary Determination for JEA SJRPP Units 1 & 2 was completed in December 1980. Federal regulations on PSD (40 CFR 52.21) require the following air quality impacts to be addressed:

1. National Ambient Air Quality Standards
2. PSD increment impact
3. Visibility, soils and vegetation impacts
4. Impacts due to growth caused by the proposed source
5. Best Available Control Technology (BACT)
6. Class I area impacts

After their review, EPA has made a preliminary determination that the construction can be approved provided certain conditions are met.

The predicted impact of the SJRPP on the Okefenokee Wilderness Area Class I Area increments is presented in the following table:

TABLE 2

Increment	Pollutant	
	Particulate	SO_2
Annual	20%	50%
24 Hour	10%	80%
3 Hour		72%

It appears that the SJRPP would not violate the Class I PSD increments in the Okefenokee.

The percent consumption of the applicable Class II PSD increments caused by the JEA Plant and other new sources are present in the following table:

TABLE 3

Increment	Pollutant: Particulate	Pollutant: SO_2
Annual	12%	12%
24 hour	46%	46%
3 hour	N/A	65%

The plant should not violate the increments or cause significant deterioration in the Jacksonville area.

Nonattainment Areas

The extent of the contribution of the proposed plant to the formation of ozone and, therefore, its impact on the Jacksonville ozone nonattainment areas cannot be estimated through modelling. However, because of the plant's low emission levels of oxidants and hydrocarbons (the primary precursors of ozone), it was assumed by JEA that the impacts of the proposed plant on ozone concentrations in the Jacksonville area will not be significant.

The impact of the plant on the Jacksonville particulate nonattainment area was estimated through modelling and compared with the USEPA "significance levels" which are $1 \mu g/m^3$ for an annual average and $5 \mu g/m^3$ for a 24-hour average. The TSP nonattainment area basically covers the central downtown area and is at its closest point 9.4 km from the proposed plant.

The annual average impact was calculated using the total TSP emissions from the operation of the proposed plant including fugitive dust emissions from the coal handling facilities, coal unloading facility, limestone handling, waste disposal and cooling towers. The results of the analysis indicate that the annual average TSP impact on the nonattainment area would be less than one $\mu g/m^3$ the EPA significance level. The maximum 24 hour TSP impact would be $4 \mu g/m^3$, which is less than the $5 \mu g/m^3$ EPA significance level.

It, therefore, appears that the proposed SJRPP will not have a significant adverse effect on the downtown Jacksonville area.

Impacts on Visibility

The proposed power plant may have an impact on visibility in the area.

Visibility is defined as the greatest distance at which it is just possible to see and identify with the unaided eye a prominent dark object against the sky at the horizon in the daytime or a known unfocused moderately intense light source at night. Visibility is diminished by four major processes: light scattering by gas molecules, light scattering by particles, light absorption by gases not naturally occurring in the atmosphere, and light absorption by particles.

Coal-fired power plants affect visibility through the three major combustion related pollutants: particulates, sulfur dioxide, and nitrogen dioxide. Visibility is decreased by particulates primarily through light scattering; by nitrogen dioxide through absorption and later by scattering due to conversion of gaseous nitrogen dioxide to particulate nitrates and nitrites; and by sulfur dioxide when it converts to particulate sulfates.

The frequency distribution of the visibility observed at Jacksonville Imeson Airport over a five-year period is summarized in the application. The average quarterly background visibility at Jacksonville Airport is seldom greater than 12 miles or less than two miles. Visibility conditions greater than or equal to those measured at Jacksonville can be expected at St. Augustine (70 km southeast) and the Okefenokee Class I area (60-70 km northwest). Using equations, the background conditions may be calculated and the SO_4 (sulfate) and TSP impacts at the Okefenokee Class I and St. Augustine historical areas may be estimated so that the visibility impacts at these areas may also be estimated. For purposes of this simplified analysis, it was necessary to assume that SO_4 and TSP are the only pollutants contributing to visibility reduction. It was also assumed that the background visibility is 12 miles. The calculated new visibility due to the SJRPP was 10.8 miles.

This corresponds to a reduction of approximately 10 percent in the visual range at the Okefenokee Class I area during worst-case conditions. A similar calculation shows that the visual range at St. Augustine is estimated to be 11.1 miles, or a worst-case reduction of approximately 8 percent. It should be noted that these visibility reductions resulting from the TSP, and SO_4 transformation from SO_2 are estimated based on Gaussian Plume modelling at large distances and empirical extinction coefficients and transformation rates. Therefore, the estimates from such calculations cannot be considered precise.

An analysis was made of 5 years (1964-1968) of Jacksonville surface wind data that is resolved to 22.5 degree sectors to determine the percent of time during which the winds would carry the proposed plant plume in the directions of the Okefenokee Class I area and the St. Augustine area. The 5-year average percent occurrence of winds toward St. Augustine is only 5.6 percent. The 5-year average percent occurrence of winds toward the Okefenokee Class I area is 11.2 percent. The visibility reductions previously discussed do not represent full-time visibility impairment, only the estimated maximum visibility impairment during these periods when the winds blow in the critical directions.

4. Best Available Control Technology

Section 17-2.03 Florida Administrative Code (FAC) and Section 169, 424SC 7401 require evaluation of proposed air pollutant emission control equipment and a determination as to whether or not an applicant will utilize the Best Available Control Technology (BACT) for each pollutant.

The installation of high efficiency electrostatic precipitators to control particulate emission from the boilers, bag filters to control particulate emissions from fly ash handling, and liquid spray and bag filter systems to control particulate emissions from coal handling and lime and limestone handling all represent BACT.

The use of washed coal and the installation of limestone scrubbers will achieve a 90% reduction of the potential sulfur oxide emissions and would comply with EPA's requirements under 40 CFR Part 60, Federal New Source Performance Standards.

The use of boiler design controls which limit flame temperature and oxygen availability in order to control the formation of nitrogen oxides in the boiler to 0.6 pounds per million BTU is considered by EPA to be BACT. Likewise, the use of boiler controls to limit the emission of carbon monoxide is also considered BACT.

The Department of Environmental Regulation, having considered (a) all available scientific, engineering and technical material, (b) existing emission control standards of other states, and (c) the social and economic impact of the application of such technology, also finds the emission control technology to be used by JEA to be the Best Available Control Technology, as shown in the following:

The proposed facility will consist of two 600 megawatt coal-fired electric utility steam generating units to be located in Jacksonville, Florida. The units will be designed for possible conversion to oil, gas or refuse firing. There will be an oil fired auxiliary boiler rated at 200 million Btu/hr estimated to have an annual capacity factor of 5 percent compared to 74 percent for the two units.

The plant will be located in Duval County which is classified nonattainment for the pollutant Ozone (17-2.16(1)(c) F.A.C.). It will be located in the area of influence of the Jacksonville particulate nonattainment area (17-2.13(1)(b) F.A.C.), however, the plant will not significantly impact the nonattainment area and is, therefore, exempt from the requirements of Section 17-2, 17 & 18 & 19 with respect to particulate emissions. The facility must comply with the provisions of 17-2.04 F.A.C. (Prevention of Significant Deterioration).

BACT Determination Requested by the Applicant:

Pollutant	Emission Limit
Particulates	0.03 lb/million Btu input
SO_2	0.76 lb/million Btu input
NO_x	0.60 lb/million Btu input
CO	0.05 lb/million Btu input

Particulate emissions are to be controlled using an electrostatic precipitator (ESP). SO_2 emissions are to be controlled with a limestone wet scrubbing system. There is no specific control technology for control of NO_x and CO emissions. BACT is to be manufacturer's guarantee for state-of-the-art burner design parameters to minimize emissions.

Flyash emissions are to be controlled using a pneumatic transfer system and bottom ash using a wet transfer system. Emissions from coal and limestone handling are to be controlled by use of enclosed conveying systems with baghouses rated at 99.9 percent efficiency. Water suppression to control dust is to be used as required.

Bio-Environmental Services recommended a 65% reduction in NO_x emissions or 0.5 lb/million Btu heat input. This was the only exception to unanimous acceptance of the NSPS emission limits as BACT.

BACT Determination by DER:

Pollutant	Emission Limit
Particulates	0.03 lb/million Btu input
SO_2	0.76 lb/million Btu input
NO_x	0.60 lb/million Btu input
CO	0.05 lb/million Btu input

NSPS, Subpart Da, standards of performance for electric utility steam generating units for which construction is commenced after September 18, 1978, is determined as BACT for the proposed project. The proposed control equipment is state-of-the-art and determined as BACT.

Emissions from the auxiliary boiler are minor compared to the main units. The auxiliary boiler will operate only when one of the main units is not in operation. Limited operation of the auxiliary boiler is determined as BACT.

The emission rates proposed by JEA are equal to or better than the New Source Performance Standards. The emission rates adopted by the U.S. EPA are based on extensive recent evaluations of technology employed by the electric power industry in the United States. The emission rates requested by JEA are more restrictive than Florida's emission limiting standards for new coal fired fossil fuel steam generators with a heat input greater than 250 MMBTU/hour.

A determination of Best Available Control Technology for visible emissions from the unit was not requested by the applicant. Specific emission rates were not requested for the limestone and coal handling systems.

The applicant's requested emission rate of 0.76 lbs/MMBTU with 90% removal of SO_2 constitutes Best Available Control Technology for this pollutant. Provision of SO_2 removal efficiency of greater than 90% would not markedly improve the ambient air quality in the area, therefore the increased cost of additional removal efficiency would neither be cost effective nor warranted. The additional waste of large quantities of fuel energy and the use of greater land areas required to meet SO_2 removal rates more efficient than 90% are not justified by the degree of air quality improvement projected.

To achieve the 90% SO_2 reduction, JEA analyzed two control processes, the lime/limestone system selected and a lime spray dryer system. The preferred lime/limestone system utilizes an aqueous lime/-limestone solution to absorb SO_2 and convert the gas to calcium sulfate or gypsum. The alternative system utilizes a spray of an aqueous lime solution to absorb SO_2. The solution is evaporated leaving a calcium sulfite/ sulfate particulate which is collected as a powder. The waste powder is not marketable and cannot be landfilled without treatment. Consequently, the comparative costs over the limestone system will be greater.

The applicant's requested emission rate of 0.03 lbs/MMBTU for particulate is 70% lower than the emission rate currently allowed by Florida's emission limiting standards for new coal fired fossil fuel steam generators. The applicant reviewed assessments of the particulate control alternatives which concluded that fabric filter system and precipitators would be roughly equivalent in terms of the degree of control achieved and that wet scrubbers would not be suitable. Wet scrubbers are not considered suitable for the following reasons:

* The wet scrubber would be intergral with the FGD system, thus preventing emergency bypassing of the FGD system while maintaining particulate matter emission limits.
* The wet scrubber approach requires the use of wet and semi-wet induced draft fans. Wet and semi-wet fans have traditionally experienced corrosion and imbalance problems.
* The flue gas pressure loss across the scrubber is very high, on the order of 25 inches of water. This requires the application of extra energy to maintain the required gas flow through the system.
* Fly ash would have to be handled in a wet mode, thus limiting its marketability as a valuable resource.
* Since the fly ash would enter into the FGD liquid circuitry, contamination of the FGD system by-product would occur thus making it unsuitable for the manufacture of wallboard.

In comparing the practicality of the other two modes, the electrostatic precipitator constitutes proven technology on units of the size proposed by JEA. However, while the U.S. EPA has published studies on two facilities of 39MW and 175MW capacity which are utilizing fabric filters, the application of this technology to a 600 MW unit with flue gas desulfurization could produce scale up difficulties. Further, an analysis conducted by the Seminole Electric Cooperative on 640 MW units indicated the cost of fabric filters to be an additional $5 million in capital and $2 million/year in maintenance. JEA found that a fabric filter could cost as much as $38.7 million more on a capitalized annual basis. Therefore, although the U.S. EPA finds that the New Source Performance Standard of 0.03 lbs/MMBTU is achievable with either baghouse or electrostatic precipitator as Best Available Control Technology for particulates, JEA chose to use electrostatic precipitators.

The applicant requested that an emission rate of 0.60 lbs/MMBTU be declared Best Available Control Technology for nitrogen oxides (NO_x). This is consistent with the proposed federal New Source Performance Standards. Reductions in nitrogen oxide emissions would be accomplished through boiler design.

Equipment designers have guaranteed that NO_x emissions from units will not exceed 0.6 lbs/MMBTU at loads ranging from 20% to 100%. Since loads of less than 20% are only due to startup or operation as spinning reserve, guarantees for that range are recognized as acceptable practice, particularly on base load units. Based on presently available information, an emission rate of 0.6 lbs/MMBTU constitutes Best Available Control Technology for nitrogen oxides from JEA's proposed boilers.

The use of boiler controls and oxygen monitors to limit carbon monoxide to 0.05 lbs/MMBTU (296 lbs/hr) is considered to be BACT.

The applicant did not request a visible emission limit for the proposed facility. The U.S. EPA's new Source Performance Standards specify a visible emission limit of 20% opacity with an allowable opacity of not more than 27% for six minutes in any hour. The Florida Standards for new coal fired fossil fuel steam generators limits the visible emissions to 20% opacity except that 40% opacity may not be exceeded more than two minutes in any hour. Because the proposed federal standards have been based on a review of the best control technology available, the Best Control Technology Available constitutes 20% opacity except that an opacity of 27% may not be exceeded more than six minutes in any hour.

Fugitive Dust

Fugitive dust is produced by a number of sources associated with the project. These include the coal handling system, lime and limestone handling system, fly ash handling system, and FGD waste handling and disposal systems. Also since brackish water cooling towers will be used, EPA has indicated that dissolved and suspended solids in the small droplets fraction (less than 50 microns diameter) of cooling tower drift would be considered fugitive dust in the impact assessment. The following paragraphs describe the control systems and/or methods proposed as BACT for these fugitive dust sources.

Coal Handling Fugitive Dust Collection

Control and collection of fugitive particulates in the coal handling system will be accomplished by several different methods, including totally enclosed conveying systems, water spray dust suppression systems, and dust collection systems utilizing fabric filters.

The ship unloading facility will have dry dust collection systems capable of 99.9 percent control efficiency on the unloader receiving hoppers. All conveyors will be totally enclosed and each transfer point fitted with dry dust collection systems, with the exception of the stacker-reclaimer which will be fitted with a water spray dust suppression system capable of 97 percent efficiency. The rail car loading facility will be enclosed in a building and fitted with a dry dust collection system. The coal surge pile in the ship unloading area will be treated by wetting agents to achieve a 90 percent control efficiency.

Coal will be unloaded at the plant site by a rotary car dumper which will be housed in an unloading building with a wet dust suppression system. This is expected to have a dust control efficiency of 97 percent. From the delivery point, totally enclosed belt conveyors will be used to transport the coal to the coal handling building. Surge bins in the coal handling building will be vented with fabric filter dust collectors (efficiency of 99.9 percent), and similar collectors will be located at all conveyor discharge points. Conveyors between the coal handling building and the stacker-reclaimer will not be enclosed, but coal dust associated with these conveyors will be controlled by a water spray dust suppression system. Dust releases in the stacker-reclaimer area (active coal pile) will be controlled by wetting agents for an efficiency of 90 percent. Dust releases from the inactive coal pile will also be controlled by wetting agents.

All conveyors from the coal handling building to the power house will be enclosed, and fabric filter dust collectors will be utilized to vent the storage silos in the power house and all conveyor transfer points. Tripper conveyors will be enclosed in a gallery.

Lime and Limestone Fugitive Dust Collection

Control and collection of fugitive dust particulates from the limestone and/or lime addition system for the FGD equipment will be accomplished by appropriate types of fabric filter dust collectors.

Lime will be the "pebble" type and will be transported at the site by pneumatic conveyors and stored in silos. The pneumatic conveyors and silos will be vented to fabric filters in order to assure that the fugitive lime dust particles are collected in an efficient manner.

Limestone will be transported at the site by totally enclosed belt conveyors. All silos and hoppers utilized by the limestone system will be vented to fabric filter dust collectors. Similar collectors will be located at all conveyor discharge points.

All fabric filter dust collectors in the lime or limestone additive system will have an efficiency of 99.9 percent.

Control and Collection of Fugitive Fly Ash Particulates

In the fly ash handling system, fugitive fly ash particulate will be controlled at all transfer and discharge locations by fabric filters. The fly ash handling system consists essentially of ash hoppers located beneath the flue gas particulate collection equipment. Pneumatic conveyors are utilized to transfer fly ash to and from ash storage silos, and to mixers which prepare the ash and FGD wastes for disposal. Pneumatic conveyors are by their nature enclosed. Discharge for the conveyor's blower(s) will be equipped with fabric filters with greater than 99 percent collection efficiency.

Cooling Tower Drift

The dissolved and suspended solids in the small droplet size fraction of brackish water cooling tower drift is considered by EPA to contribute to total suspended particulates. This contribution is minimized by using high efficiency drift eliminators in the two natural draft towers (which limit drift to approximately .005 percent of circulating water flow) and by maintaining the cycles of concentration of the circulating water to a low level such as a maximum of 1.5. Additionally, a circumferential drift eliminator wall will be provided at the base of the hyperbolic shell to mitigate the potential effects of blow-through.

Upon reviewing the preceeding information, the Department also finds that the SJRPP Units 1 and 2 will not contribute to significant deterioration of air quality, although it appears that salt drift could have a significant negative impact on some of the dairy-pasture-lands in the area. Pasture grasses such as Pensacola bahia are highly intolerant of excessive concentrations of NaCl.

5. Acid Rain

In recent years the increase of rainfall acidity levels across Florida and other parts of the country has been ascribed in part to the air emissions from coal-fired power plants. Hence the requirement for emission controls on these plants, designed to reduce the potential acid causing factors. Generally, sulfur dioxide and oxides of nitrogen are believed to be the primary anthropogenic agents contributing to rainfall acidification. However, a great deal remains unknown about the amount that these two gases contribute to the problem, as well as how and where the acidification takes place.

It should be noted that rainfall under unpolluted conditions tends to be somewhat acidic, on the order of pH 5.6-5.7. This is due to the absorption of carbon dioxide in water in the atmosphere. Also, neither sulfur dioxide nor nitrogen dioxide in and of themselves are acidic. It appears that after a certain amount of time, estimated to be on the order of 3-4 days, these gases interact with sunlight, water vapor, ammonia, and many other chemical compounds in the atmosphere, which converts them to sulfuric acid and nitric acid. Scientists around the world are studying the rate of these reactions, which catalytic aids (sunlight, water, etc.) have the most effect driving the conversion, ways to prevent the end acidic product from affecting the environment, where the end product eventually makes its impacts, and numerous other questions relating to the conversion reactions. It is universally agreed that the entire cause-effect-control relationship is very complex.

There are three issues relevant to the licensing of SJRPP Units 1 & 2 as an emission source in relation to acidic rainfall. These are: (1) why is the problem of concern, (2) what will be the Unit's contribution to the regional, state and country wide problem, and (3) what controls are required to mitigate the problem?

First, the following effects have been ascribed to above-normal acidic rainfall. Acid rain is listed as a cause for destabilization of clay minerals, reduction of soil cation exchange capacity, promotion of chemical denudation of soils, and promotion of runoff. Vegetational effects tend to be quite varied, ranging from a few cases of reported beneficial effects, to the more prevalent harmful effects. The harmful effects include foliage damage, alteration of reponses to pathogens, symbionts and saprophytes, leaching of essential materials from plant surfaces, and destruction of the protective waxy leaf coatings. Impacts to wildlife are generally indirect, but nonetheless potentially significant via habitat alteration. Effects on aquatic ecosystems begin with changes in water quality. The water quality changes are brought about by acidification via direct input of rainfall (or snow melting in the northern states), indirect changes from erosion and previously impacted soil contributions, as well as a cascading effect wherein the addition of acid components and soil-based catalytic materials frees up often-times toxic metals or other wastes which were previously chemically bound. These problems then effect population balances of aquatic organisms by interfering with breeding and reproduction, poisoning, or elimination of food supplies, which frequently result in termination of particular species within those aquatic ecosystems. These population shifts also occur in the aquatic vegetation, further compounding the problem.

Second, the pH levels in Florida lakes, primarily those in the northern part of the state, have been dropping, e.g., becoming more acidic, over the past two decades. Many of Florida's perched sand lakes have little or no buffering capacity and are therefore very susceptible to acid rain.

Trends in data seem to indicate that most of the acidity is derived from sulfur dioxide sources in the northeastern United States. Conversion from sulfur dioxide into sulfuric acid appears to start affecting the environment more than 50 km from the source, and the acid is susceptible to long range transport. Florida is subject to frequent cold fronts moving into the state in the winter months, which are suspected of bringing in northern-based pollutants.

Florida itself has relatively few coal-fired industries at this time, but combustion of oil and gas as well as emissions from heavy industries such as pulp mills and the phosphate industry make significant contributions to SO_x and NO_x loadings. Normal sources of atmospheric sulfur in this state are derived from sea-salt, a non-polluting source, which tends to obscure the acidic sulfur components. Hence, in terms of Florida's impact on other parts of the country, this state tends to be the recipient rather than the donor. As more coal-fired industry is utilized, this balance may begin to shift. The impact from a source such as the SJRPP would be to contribute slightly to the problem, but would not be registered until some distance from the plant, perhaps 100 km or so. The degree of impact, as implied earlier, is extremely hard to quantify. Some studies indicate that the majority of acidic fallout impacts may occur 200-300 kilometers from the source.

One feature that will mitigate some of the impact of SJRPP Units 1 & 2 is that stringent sulfur emission controls will be required prior to Unit operation. These units will thus have less impact than that of other units which do not employ those emission controls. The SJRPP Units 1 & 2 will utilize flue gas desulfurization scrubbers to limit sulfur emissions. Oxides of nitrogen will be controlled by boiler design. Such control will also help mitigate the rainfall acidification problem. The primary source of nitrogen oxides appears to be automobile emissions.

In balancing the need for power with the environmental impacts from the operation of the plant, at this time, the required use of scrubbers and boiler controls seems to be the most relevant and effective way of addressing the unit's contribution to rainfall acidification. In regards to the whole issue of rainfall acidification in the State of Florida, the state, utilities, universities and other industries as well as similar entities throughout the world have been researching the problem.

Construction of new coal fired units may have a slightly positive effect on the acid rain problem in Florida. Data collected during the Florida Sulfur Oxides Study indicated that the conversion of sulfur dioxide to sulfuric acid forms two to three times faster in the exhaust plume from an oil fired power plant than from a coal fired power plant. Oil fired power plants in Florida do not have emission controls for sulfur oxides or nitrogen oxides in most instances. As new coal fired power plants are built with pollution control devices, and as these new coal plants replace the oil plants that emit greater quantities of SO_x and NO_x, then air pollution levels and acidic rainfall may decrease.

6. Radioactivity

The fact that there are radioactive emissions from the combustion of coal has been recognized for some time. Recent articles have disclosed the fact that the amount of such emissions can be greater from a coal-fired power plant than from a normally operating nuclear reactor. The question then becomes how much greater are these emissions and do these pose significant health impacts.

The Department of Veteran and Community Affairs appended to their report on TECO Big Bend Unit 4 a report made by the Radiological Health Services Section of the Department of Health and Rehabilitative Services (HRS) focusing on this issue. Also, TECO briefly addressed radioactivity in their application.

The following discussion has been compiled from exerpts from the HRS report which is oriented to country-wide coal sources and potential impacts thereof, from a section of the TECO Big Bend 4 application which contains data more specific to the type of coals expected to be used, and an article in the 8 December 1978 issue of "Science", titled "Radiological Impact of Airborne Effluents of Coal and Nuclear Plants", by McBride, Moore, Witherspoon, and Blanco.

Coal contains at least 50 percent carbon by weight, as well as sulfur, iron, moisture, and trace quantities of naturally occurring radioactive materials such as Uranium, (U-235, U-238), Thorium (TH-232), their decay products, and potassium-40. When coal is burned, the mineral content of the coal is converted to ash and slag. These waste materials contain most of the radionuclides originally present in the coal. A fraction of the ash is released to the atmosphere, and the remainder is collected and either re-utilized or landfilled.

Various factors affect particulate emission of radionuclides from coal-fired power plants. These include the type of coal and its source, the type of furnace used for combustion, and the equipment type and efficiency of the air emission control equipment.

Radionuclide concentrations in the released particulates may be enriched relative to those in the mineral content of the fuel as a result of the combustion and emission control processes. Enrichment factors for uranium as great as 2.0 are reported while enrichment factors as great as 5.0 are reported for lead and polonium. The actual exposure of humans and the environment to coal emitted radioactivity depends on the emission rate, the stack height and local meteorological conditions.

The Oak Ridge National Laboratory at the request of the U. S. Environmental Protection Agency has made preliminary projections of the health impact of radionuclide emissions from coal-fired power plants. They used a model for new plants based on 550 MW unit burning a western coal with a higher radionuclide content than coals under consideration for the SJRPP.

The Oak Ridge/EPA assessment was initially based on a 1% ash emission rate. It considered dispersion based on stack height and the general atmospheric or meteorological conditions in the region. Also considered was the average distance from the source to potentially exposed population centers. Certain assumptions were also made about the primary mode of exposure to radioactivity i.e. that this could be by ingestion of food grown in the region impacted by the plant. Some exposure could also come by inhalation of fine particles and by contamination of water supplies.

The following table summarizes the doses which could be received from the 550 MW plant in a suburban area, based on the Oak Ridge assumptions.

TABLE 4

Annual Radiation Doses from Radioactive Particulate Emissions From the Model "New" Coal Fired Station (550 MW Plant Burning Western Coal).

Organ	Maximum Individual Dose (mrem/yr)
Lung	1.1
Bone	2.1
Kidney	1.0
Liver	0.9
Thyroid	1.1
G. I. Tract	0.8
Other Soft Tissue	1.1

As a point of reference the following table indicates human dose rate comparisions between emissions from a 1000 MW coal fired plant and natural background radiation, as well as the allowed amounts from a nuclear reactor:

TABLE 5

Dose Commitments from Airborne Radioactivity Released At 1000 MW Power Plants.

Types, Units	Coal Fired Plants	Pressurized Water Reactor	Background	Federal Allowances
Maximum Individual (mrem/yr)				
Whole Body	1.9	1.8	80	5
Bone	18.2	2.7	120	15) iodine
Thyroid	1.9	3.8	—	15) iodine

The maximum individual dose commitments from the 1000 MW plant were estimated at the plant boundary at 500 meters from the release points. Dose commitments would be less at greater distances. The ingestion component of the dose commitment was based on the assumption that all food is grown and consumed at the site boundary. The initial calulations were based on a release height of 20 meters with no plume rise. As a result the doses listed above are extremely conservative.

If SJRPP Units 1 & 2 are built, total plant electric output will use around 1200 MW, or possibly 1.2 times the amount listed in Table 4. For whole body doses from airborne emissions, if the SJRPP site output is comparative to the emissions from the 1000 MW plant used above, then roughly 2.9 mrems/yr exposure might be received, or about 3/5 of what is allowed for light water reactors. Comparision with the Pressurized Water Reactor (PWR) statistics for bone dosages indicates a potential problem for persons whose lifestyle matches the assumptions listed above.

The following table summarizes the risks associated with dose projected for the 550 MW model plant previously described:

TABLE 6

Individual Lifetime Risks and Number of Fatal Cancers Due to Radioactive Particulate Emissions From the Model "New" Coal Fired Station (550 mw Plant Burning Western Coal) for Suburban Site.

	Risk
Individual Lifetime Risks	
Maximum Individual	1.4×10^{-5}
Average Individual	4.8×10^{-7}
Expected Fatal Cancers per Year of Operation	1.7×10^{-2}

The JEA SJRPP Units 1 & 2 impact could be approximately twice as much.

Impacts from the radioactivity retained in the ash and slag are expected to be minimal for several reasons. Ash stored on JEA's site will be landfilled, which should provide a natural earthen buffer to radioactivity. These landfill areas are not the sort of areas frequented by the public, although some slight unquantified level of radioactive component of the ash should be low.

Contamination of drinking water supplies via leaching of radioactive materials could be of some concern. However, JEA will be required to construct the ash landfills to deter infiltration by rainwater, reducing the potential for leaching. Also, the depth to the Floridan aquifer and the buffer provided by the clays of the Hawthorn Formation will help minimize this potential problem.

In Section VI.D.2., the Department has expressed concern over the potential for groundwater contamination from leaching of various chemicals and metals into the surficial aquifer and thence to the marsh or river. This may also be of concern regarding radioactive leachates, if the radiation levels are somewhat high. However, since the radioactivity of the ash is unknown and the leaching rate is unknown, it is impossible to determine whether or not the radiation levels in the groundwater leachate will be significant. Contamination of water supplies can be directly quantified by monitoring of groundwater quality. Comparison of monitoring well data from the site with state groundwater quality criteria for radioactivity will be made. Should problems be directly indicated, rectification will be required.

7. Coal Dust from Trains

The movement of coal supply trains to the proposed plant from coal mines outside the state will result in increased fugitive dust levels in areas near the railroad tracks. These increases in fugitive dust levels will be primarily the result of road bed dust emissions and coal dust blowing from the exposed coal contained within each hopper car. The only other quantifiable emissions associated with the coal trains result from the diesel locomotive emissions, which are relatively minor.

For an impact analysis of the coal trains as they move through Jacksonville, it was assumed that trains will travel 500 miles from the mines and that there will be a maximum of three trains per day with 72 cars per train, and a maximum of 106 tons of coal per car. An estimated one percent of coal by weight will be lost as fugitive dust over a journey of about 500 miles with an estimated 90 percent of the total losses escaping during the first few hours of train transit. This implies that only 0.1 percent of the original coal weight will be dispersed as fugitive dust during the rest of the trip, and only a small fraction of the 0.1 percent will be dispersed in the Jacksonville area.

The fugitive dust emissions from agitated road bed dust in the Jacksonville area were estimated using USEPA Publication AP-42 (1979), assuming that the road bed dust emissions are conservatively approximated by emissions from motor vehicles traveling on unpaved roads and that each train will travel at an average speed of 10 miles per hour.

The 24-hour average TSP level in the Jacksonville area resulting from the operation of three coal trains per day (a conservative estimate) was calculated to be 22 $\mu g/m^3$ at a distance of 100 meters downwind of the railroad tracks under light wind conditions. When added to the Jacksonville area background level of 50 $\mu g/m^3$, this total is relatively small compared to the National Ambient Air Quality secondary standard and Florida standard of 150 $\mu g/m^3$. It is noteworthy that the amount of the fugitive coal dust which was estimated to blow off the coal cars is about half of the expected emissions resulting from agitation of roadbed dust. This is primarily because of the very conservative method that was employed to estimate roadbed dust emissions.

8. Trace Elements

Eighteen trace elements were selected for review on the basis of reported high concentrations in coal, capability for volatilization during combustion, potential for toxicity, and existence of regulatory guidelines. Since a coal source has not been selected, trace element concentrations in coal were obtained from a report on trace elements in coal samples from the eastern United States.

The predicted deposition rates were determined on the basis of coal consumption, trace element concentration, and SO_2 emission rates. Elements considered to be volatile were assumed to exit the stack in an uncontrolled manner. Those trace elements typically occurring as particulates or absorbed on particulates were also assumed to exit in an uncontrolled state. These assumptions were utilized due to the lack of information on the behavior of trace elements passing through an FGD system. In addition, the use of these assumptions introduced a degree of conservatism to the assessment.

Studies of model power plants in most cases predicted increases in soil trace element levels of less than 10 percent of the total endogenous concentrations over the life of the model plant. It was concluded that uptake by vegetation could not increase dramatically unless the forms of deposited trace elements were considerably more available than the endogenous forms.

The estimated increases ranged from 1.5×10^{-5} to 1.2×1 percent, using average soil background concentrations. The estimated increases over the 40 year life of the plant, assuming that the elements remained concentrated in the top 25 cm of soil over this period ranged from 5.9×10^{-4} to 4.7×10^{-1}. The assessment of these estimated increases was based on a number of worst case conditions. Under these conditions there should not be a perceptible increase on an annual basis. Over the 40 year plant life, those elements exhibiting a higher percent increase relative to the others studied included: arsenic, boron, cadmium, lead, mercury, and molybdenum.

The estimated soil concentration increase for arsenic would be 1.48 x 10^{-2} mg per kg of soil over the 40 year plant life. Naturally occurring arsenic levels in soils average about 6 ppm. Soil arsenic concentrations greater than 2 ppm, soluble form, have been shown to produce injury symptoms on alfalfa and barley and as such no effect could be expected under worst case conditions.

The estimated soil concentration increase for boron would be 2.5 x 10^{-2} mg per kg of soil over the 40 year plant life under worst case conditions. Naturally occurring boron concentrations range from 2-100 ppm with the highest levels found in saline and alkaline soils. The average value is considered to be about 10 ppm. Using a toxicity level of 0.5-10 ppm for plants sensitive to boron as a means for comparision, no adverse effects to sensitive species such as citrus would be expected under worst case operating conditions.

The estimated soil concentration increase for cadmium would be 1.43 x 10^{-4} mg per kg of soil over the 40 year plant life. This represents a 2.4 x 10^{-1} percent increase in soil concentration over the average background level of 0.06 ppm, which is high in comparison with the other elements addressed. Toxicity to plants is reported to occur when cadmium concentration in plant tissues reaches about 3 ppm and it is unlikely that the estimated soil concentration will be high enough for the accumulation of 2 ppm in leaf tissue within the vicinity of the proposed plant.

The estimated soil increase for lead would be 3.49×10^{-2} mg per kg of soil over the 40 year plant life. Naturally occurring lead concentrations in soil averages about 10 ppm. Based on reported threshold concentrations of 10 ppm lead in solution culture, the addition of 3.49×10^{-2} mg lead per kg of soil to soils containing as much as 5 ppm lead should not result in any adverse effects. It is thought that lead enters the plant primarily through the leaf surface. However, the effect of such accumulations cannot be predicted due to the lack of information concerning the concentration of lead in plants due to leaf deposition.

The estimated soil increase for mercury would be 1.19×10^{-4} mg per kg of soil. Naturally occurring mercury concentrations in soil average 0.1 ppm. Most higher vascular plants are resistant to toxicity from high mercury concentrations even though high concentrations are present in plant tissue. Concentrations of 0.5-50 ppm are found to inhibit the growth of cauliflower, lettuce, potato, and carrots. The addition of 1.19×10^{-4} mg per kg of soil is not considered to result in any adverse effect.

The estimated soil increase for molybdenum would be 2.73×10^{-3} mg per kg of soil over the 40 year life. Naturally occurring background concentrations average about 2 ppm. Molybdenum toxicity is rarely observed in the field since most plants seem to be able to tolerate high tissue concentration. A Mo concentration of 5 ppm in nutrient solution was found to be toxic to clover and lettuce. It would appear to be unlikely that the contribution of Mo from the proposed plant would result in adverse effects.