GRU GAINESVILLE REGIONAL UTILITIES

Strategic Planning

November 12, 1997

Via Fax & Mail

Mr. Scott Sheplak, P.E.
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 5505
Tallahassee, FL 32399-2400

RE: City of Gainesville/Gainesville Regional Utilities
J. R. Kelly Generating Station
Draft Title V Permit No. 0010005-001-AV
Modeling Results - Unit 6

Dear Mr. Sheplak:

Pursuant to the Department's request, enclosed is the assessment of ambient SO2 impacts for the J. R. Kelly Generating Station Unit 6 while combusting natural gas. The assessment demonstrates that the combined impacts of Unit 6 burning natural gas and Units 7 and 8 burning 2.5% sulfur fuel oil will not cause an exceedance of the ambient air quality standards for SO2.

Please call me at (352) 334-3400 Ext. 1284 if you have any questions.

Sincerely,

Yolanta E. Jonynas

Yolanta E. Jonynas
Sr. Environmental Engineer

Attachments

xc: L. Anderson, FDEP
D. Beck
R. Manasco
A. Morrison, HGSS
G. Swanson
CAA Title V

November12jrktv

GAINESVILLE REGIONAL UTILITIES
J.R. KELLY GENERATING STATION
ASSESSMENT OF AMBIENT SO_2 IMPACTS

An assessment of ambient SO_2 impacts due to the operation of Units 7 and 8 at the Gainesville Regional Utilities (GRU) J.R. Kelly Generating Station was previously conducted using EPA's SCREEN3 dispersion model and submitted to FDEP. At the request of FDEP, additional SCREEN3 modeling was conducted to assess the impact of Unit 6 at the J.R. Kelly Generating Station. Specific data used in the SCREEN3 modeling analysis and model results are summarized in the following sections.

A. SO_2 Emission Rates and Stack Parameters

Modeled SO_2 emission rate was based on Unit 6 being fired with natural gas. Maximum SO_2 emission rate was calculated using the AP-42 emission factor of 0.6 lb/MMft^3 (equivalent to 0.0006 lb SO_2/MMBtu using a natural gas heat content of 1,000 Btu/ft^3) and maximum heat input rate of 187 MMBtu/hr.

Stack parameters for Unit 6 were based on historical conditions since the physical stack for Unit 6 was recently demolished. A summary of Unit 6 stack parameters is included on revised Attachment I. Building structures which could result in downwash (i.e., greater than 2.5 times the common stack height and within five times the lessor of the building structure's height or projected width) were assessed and appropriate building dimensions used in the modeling assessment.

Modeled SO_2 emission rates, common stack parameters, and building dimensions are summarized in the following table:

Parameter	Units	Value
SO_2 Emission Rate	g/s	0.014
Stack Height	m	36.6
Stack Diameter	m	1.8
Stack Temperature	K	449.8
Stack Velocity	m/s	9.7
Building Dimensions:		
Height	m	18.0
Minimum Horizontal Dimension	m	28.9
Maximum Horizontal Dimension	m	47.9

GAINESVILLE REGIONAL UTILITIES
J.R. KELLY GENERATING STATION
ASSESSMENT OF AMBIENT SO_2 IMPACTS

B. SCREEN3 Model Options

The SCREEN3 modeling assessment utilized the regulatory defaults for mixing heights and anemometer height, full meteorology, and rural dispersion coefficients. Use of rural dispersion coefficients is consistent with the EPA recommended Auer classification method. The area within a 3-km radius of the J.R. Kelly Generating Station is predominately single family residential dwellings with undeveloped land (i.e., the Paynes Prairie area) beginning approximately 2.0 km to the south of the plant. Based on this land use, the area within a 3-km radius would be characterized as rural using the Auer classification method. SCREEN3 model output is provided as Attachment II.

C. SCREEN3 Model Results

The SCREEN3 dispersion model is a single-source model which yields maximum one-hour impacts. The maximum one-hour SO_2 impacts were converted to 3-, 24-hour, and annual averaging periods using the EPA recommended multipliers of 0.9, 0.4, and 0.08, respectively.

SCREEN3 SO_2 model results for the GRU J.R. Kelly Generating Station are summarized in the following table:

Unit	Maximum One Hour Impact ($\mu g/m^3$)	Downwind Distance (m)	Maximum SO_2 Impacts		
			3-Hr ($\mu g/m^3$)	24-Hr ($\mu g/m^3$)	Annual ($\mu g/m^3$)
6	0.14	180	0.13	0.06	0.01
7 & 8	633.5	299	570	253	51
Totals	633.6	N/A	570.1	253.1	51
	FDEP Standards ($\mu g/m^3$)		1,300	260	60

GAINESVILLE REGIONAL UTILITIES
J.R. KELLY GENERATING STATION
ASSESSMENT OF AMBIENT SO_2 IMPACTS

D. Conclusions

As summarized in the above, conservative modeling of Unit 6 SO_2 emissions using the SCREEN3 model demonstrates that maximum impacts will be insignificant. The SCREEN3 model assessment provides reasonable assurance that maximum ambient SO_2 impacts due to operation of the J.R. Kelly Generating Station Units 6, 7, and 8 will not exceed applicable FDEP ambient standards. As noted previously, the SCREEN3 model was formulated to provide conservative estimates of maximum impacts; i.e., to over-estimate actual maximum impacts.

11/10/97
14:54:46

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

GRU; KELLY PLANT, UNIT 6

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	.140000E-01
STACK HEIGHT (M)	=	36.6000
STK INSIDE DIAM (M)	=	1.8300
STK EXIT VELOCITY (M/S)	=	9.7000
STK GAS EXIT TEMP (K)	=	449.8000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	17.9800
MIN HORIZ BLDG DIM (M)	=	28.9000
MAX HORIZ BLDG DIM (M)	=	47.9000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 27.761 M**4/S**3; MOM. FLUX = 51.314 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	1	1.0	1.1	320.0	273.22	22.39	18.62	NO
100.	.8994E-01	4	20.0	24.3	6400.0	36.87	8.29	15.72	HS
200.	.1165	4	15.0	18.2	4800.0	42.15	15.78	22.30	HS
300.	.8618E-01	4	15.0	18.2	4800.0	44.97	22.87	25.18	HS
400.	.7047E-01	4	15.0	18.2	4800.0	47.28	29.73	27.97	HS
500.	.6663E-01	4	15.0	18.2	4800.0	47.28	36.37	30.61	HS
600.	.6433E-01	3	8.0	9.1	2560.0	63.46	65.22	47.15	HS
700.	.8031E-01	1	1.0	1.1	320.0	273.22	166.64	223.78	NO
800.	.8388E-01	1	1.0	1.1	320.0	273.22	184.25	290.97	NO
900.	.7877E-01	1	1.0	1.1	320.0	273.22	201.84	369.37	NO
1000.	.7265E-01	1	1.0	1.1	320.0	273.22	219.38	458.86	NO
1100.	.6729E-01	1	1.0	1.1	320.0	273.22	236.85	559.40	NO
1200.	.6270E-01	1	1.0	1.1	320.0	273.22	254.22	671.00	NO
1300.	.5871E-01	1	1.0	1.1	320.0	273.22	271.49	793.72	NO
1400.	.5522E-01	1	1.0	1.1	320.0	273.22	288.66	927.61	NO
1500.	.5213E-01	1	1.0	1.1	320.0	273.22	305.72	1072.73	NO
1600.	.4939E-01	1	1.0	1.1	320.0	273.22	322.68	1229.17	NO
1700.	.4804E-01	2	1.0	1.1	320.0	273.22	256.45	206.99	NO
1800.	.4874E-01	2	1.0	1.1	320.0	273.22	268.91	218.99	NO
1900.	.4892E-01	2	1.0	1.1	320.0	273.22	281.32	231.13	NO
2000.	.4867E-01	2	1.0	1.1	320.0	273.22	293.69	243.40	NO
2100.	.4810E-01	2	1.0	1.1	320.0	273.22	306.00	255.77	NO
2200.	.4728E-01	2	1.0	1.1	320.0	273.22	318.27	268.25	NO
2300.	.4629E-01	2	1.0	1.1	320.0	273.22	330.50	280.83	NO
2400.	.4520E-01	2	1.0	1.1	320.0	273.22	342.67	293.49	NO

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
2500.	.4404E-01	2	1.0	1.1	320.0	273.22	354.80	306.23	NO
2600.	.4287E-01	2	1.0	1.1	320.0	273.22	366.88	319.05	NO
2700.	.4169E-01	2	1.0	1.1	320.0	273.22	378.92	331.95	NO
2800.	.4054E-01	2	1.0	1.1	320.0	273.22	390.91	344.91	NO
2900.	.3942E-01	2	1.0	1.1	320.0	273.22	402.86	357.94	NO
3000.	.3834E-01	2	1.0	1.1	320.0	273.22	414.76	371.02	NO
3500.	.3590E-01	3	1.0	1.1	320.0	264.19	327.09	202.99	NO
4000.	.3577E-01	3	1.0	1.1	320.0	264.19	367.27	226.80	NO
4500.	.3454E-01	3	1.0	1.1	320.0	264.19	407.03	250.57	NO
5000.	.3521E-01	5	1.0	1.6	10000.0	113.96	219.97	59.93	NO
MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 50. M:									
180.	.1397	6	4.0	8.2	10000.0	54.44	8.89	22.26	HS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***		*** CAVITY CALCULATION - 2 ***	
CONC (UG/M**3) =	.0000	CONC (UG/M**3) =	.0000
CRIT WS @10M (M/S) =	99.99	CRIT WS @10M (M/S) =	99.99
CRIT WS @ HS (M/S) =	99.99	CRIT WS @ HS (M/S) =	99.99
DILUTION WS (M/S) =	99.99	DILUTION WS (M/S) =	99.99
CAVITY HT (M) =	21.54	CAVITY HT (M) =	18.88
CAVITY LENGTH (M) =	42.89	CAVITY LENGTH (M) =	36.08
ALONGWIND DIM (M) =	28.90	ALONGWIND DIM (M) =	47.90

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	.1397	180.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

Gainesville Regional Utilities
J.R. Kelly Generating Station
Attachment I

A. Stack Parameters

Unit	Load (MW)	Temperature (°F)	Temperature (K)	Flow Rate (acfm)	Flow Rate (acmm)	Velocity (ft/sec)	Velocity (m/s)	Height (ft)	Height (m)	Diameter (ft)	Diameter (m)
6	19.0	350.0	449.8	54,000.0	1,529.1	31.8	9.7	120.00	36.6	6.00	1.83
7	20.6	356.0	453.2	92,356.2 [1]	2,615.2	17.8	5.4	N/A	N/A	N/A	N/A
8[2]	40.0	252.3	395.5	159,173.7	4,507.3	30.6	9.3	N/A	N/A	N/A	N/A
7 & 8 Common	**N/A**	**290.4**	**416.7**	**251,529.9**	**7,122.5**	**48.4**	**14.8**	**200.0**	**61.0**	**10.50**	**3.20**

[1] Based on 9,190 dscf/10^6 Btu "F" factor, 5.94 % O_2 , 12.1% moisture, and 249 x 10^6 Btu/hr heat input.

[2] Based on 1997 RATA, average data for RA-79 through RA-87.

B. Stack Flow Rate Adjusted for Load

Unit	Load Ratio	Temperature (°F)	Temperature (K)	Flow Rate (acfm)	Flow Rate (acmm)	Velocity (ft/sec)	Velocity (m/s)	Height (ft)	Height (m)	Diameter (ft)	Diameter (m)
6	1.000	350.0	449.8	54,000.0	1,529.1	31.8	9.7	120.00	36.6	6.00	1.83
7[1]	1.000	356.0	453.2	92,356.2	2,615.2	17.8	5.4	N/A	N/A	N/A	N/A
8[2]	1.250	252.3	395.5	198,967.1	5,634.1	38.3	11.7	N/A	N/A	N/A	N/A
7 & 8 Common		**285.2**	**413.8**	**291,323.3**	**8,249.4**	**56.1**	**17.1**	**200.0**	**61.0**	**10.50**	**3.20**

[1] Load ratio based on derate to 249 MMBtu/hr (22.9 MW).

[2] Load ratio based on design rate of 50 MW divided by rate occurring during RATA testing.

GAINESVILLE REGIONAL UTILITIES
Strategic Planning

October 30, 1997

Mr. Scott Sheplak, P.E.
Bureau of Air Regulation
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 5505
Tallahassee, FL 32399-2400

RE: City of Gainesville/Gainesville Regional Utilities
J. R. Kelly Generating Station
Draft Title V Permit No. 0010005-001-AV
Modeling Results – Unit 7 and 8

Dear Mr. Sheplak:

During our October 9, 1997 telephone conversation regarding the draft Title V permit for the above-referenced facility, Gainesville Regional Utilities agreed to perform modeling to support a request to have Units 7 and 8 permitted at an SO2 emission rate of 2.75 lbs/MMBtu heat input (equivalent to the use of approximately 2.5 percent sulfur fuel oil), consistent with the Department's Rule 62-296.405(1)(c)1.j.

At that time the Department indicated that based upon favorable modeling results (i.e., no modeled exceedances of the SO2 ambient air quality standards) the fuel oil sulfur limit for Unit 7 could be adjusted to 2.5%. The Department's proposed limit of 1.5% was based on a BACT determination conducted in October 1991. While the Department agreed that Unit 8 is not subject to the BACT determination, it requested assurances that the operation of this unit and Unit 7 at an SO2 emission rate of 2.75 lb/MMBtu would not cause an exceedance of the SO2 ambient air quality standards ("AAQS").

The results of this modeling are reported in Attachment 1 and demonstrate that the maximum SO2 impacts due to the operations of these units will not exceed applicable AAQS. It should be noted that Unit 6 was not modeled on fuel oil because GRU is willing to restrict this unit to burning natural gas only.

GRU is requesting that the applicable draft Title V permit conditions be revised accordingly. Attachment 2 details GRU's suggested revisions and also includes comments on the Department's responses to GRU's initial comments on the draft permit.

Please call me at (352) 334-3400 Ext. 1284 if you have any questions.

Sincerely,

Yolanta E. Jonynas

Yolanta E. Jonynas
Sr. Environmental Engineer

Attachments

xc: D. Beck
R. Manasco
A. Morrison, HGSS
G. Swanson
CAA Title V

11/12/97 cc: Scott Sheplak
Cindy Phillips
Lenton Anderson

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NOV 03 1997
BUREAU OF
AIR REGULATION

(352) 334-3400 ext. 1260 P. O. Box 147117, Station A136, Gainesville, Florida 32614-7117 Fax: (352) 334-3151

ATTACHMENT 1

GAINESVILLE REGIONAL UTILITIES
J.R. KELLY GENERATING STATION
ASSESSMENT OF AMBIENT SO_2 IMPACTS

An assessment of ambient SO_2 impacts due to the operation of Units 7 and 8 at the Gainesville Regional Utilities (GRU) J.R. Kelly Generating Station was conducted using EPA's SCREEN3 dispersion model. The SCREEN3 model implements the procedures contained in the EPA document "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources". As stated in this document, the SCREEN3 modeling procedures incorporate a relatively large degree of conservatism to provide a reasonable assurance that maximum concentrations will not be underestimated. Specific data used in the SCREEN3 modeling analysis and model results are summarized in the following sections.

A. SO_2 Emission Rates and Stack Parameters

Modeled SO_2 emission rates were based on a maximum allowable rate of 2.75 pounds of SO_2 per million British thermal units (lb SO_2/MMBtu) and design heat input rates of 249.0 and 539.5 MMBtu/hr for Units 7 and 8, respectively. These SO_2 emission rates are equivalent to the use of approximately 2.5 weight percent sulfur fuel oil.

Units 7 and 8 exhaust through one, common stack having a height above ground of 61.0 meters (m) and an exit inside diameter of 3.20 m. Stack flow rate for Unit 7 was estimated based on stack test data obtained in 1980 and EPA Reference Method 19 "F" factor procedures. Stack flow rate for Unit 8 was obtained from recent (1997) Relative Test Accuracy Audit (RATA) data conducted in accordance with 40 CFR Part 75 procedures. Common stack exit velocity was estimated by summing the flow rates for Units 7 and 8 (adjusted for peak load) and using the common stack exit area. Common stack exit temperature was estimated by proportioning the measured exhaust temperatures for each unit by the exhaust flow rates for each unit. Details of the common stack parameter estimates are provided on Attachment I.

Building structures which could result in downwash (i.e., greater than 2.5 times the common stack height and within five times the lessor of the building structure's height or projected width) were assessed and appropriate building dimensions used in the modeling assessment.

Modeled SO_2 emission rates, common stack parameters, and building dimensions are summarized in the following table:

Parameter	Units	Value
SO_2 Emission Rate	g/s	273.2
Stack Height	m	61.0
Stack Diameter	m	3.2
Stack Temperature	K	413.8
Stack Velocity	m/s	17.1
Building Dimensions:		
Height	m	34.1
Minimum Horizontal Dimension	m	14.2
Maximum Horizontal Dimension	m	26.2

B. SCREEN3 Model Options

The SCREEN3 modeling assessment utilized the regulatory defaults for mixing heights and anemometer height, full meteorology, and rural dispersion coefficients. Use of rural dispersion coefficients is consistent with the EPA recommended Auer classification method. The area within a 3-km radius of the J.R. Kelly Generating Station is predominately single family residential dwellings with undeveloped land (i.e., the Paynes Prairie area) beginning approximately 2.0 km to the south of the plant. Based on this land use, the area within a 3-km radius would be characterized as rural using the Auer classification method. SCREEN3 model output is provided as Attachment II.

GAINESVILLE REGIONAL UTILITIES
J.R. KELLY GENERATING STATION
ASSESSMENT OF AMBIENT SO_2 IMPACTS

C. SCREEN3 Model Results

The SCREEN3 dispersion model is a single-source model which yields maximum one-hour impacts. The maximum one-hour SO_2 impacts were converted to 3-, 24-hour, and annual averaging periods using the EPA recommended multipliers of 0.9, 0.4, and 0.08, respectively.

SCREEN3 SO_2 model results for the GRU J.R. Kelly Generating Station are summarized in the following table:

Maximum One Hour Impact ($\mu g/m^3$)	Downwind Distance (m)	Maximum SO_2 Impacts		
		3-Hr ($\mu g/m^3$)	24-Hr ($\mu g/m^3$)	Annual ($\mu g/m^3$)
633.5	299	570	253	51
FDEP Standards ($\mu g/m^3$)		1,300	260	60

D. Conclusions

The SCREEN3 model assessment provides reasonable assurance that maximum ambient SO_2 impacts due to operation of the J.R. Kelly Generating Station will not exceed applicable FDEP ambient standards. As noted previously, the SCREEN3 model was formulated to provide conservative estimates of maximum impacts; i.e., to over-estimate actual maximum impacts.

Gainesville Regional Utilities
J.R. Kelly Generating Station
Attachment I

A. Stack Parameters

Unit	Load	Temperature		Flow Rate		Velocity		Height		Diameter	
	(MW)	(°F)	(K)	(acfm)	(acmm)	(ft/sec)	(m/s)	(ft)	(m)	(ft)	(m)
7	20.6	356.0	453.2	92,356.2 [1]	2,615.2	17.8	5.4	N/A	N/A	N/A	N/A
8[2]	40.0	252.3	395.5	159,173.7	4,507.3	30.6	9.3	N/A	N/A	N/A	N/A
Common	**N/A**	**290.4**	**416.7**	**251,529.9**	**7,122.5**	**48.4**	**14.8**	**200.0**	**61.0**	**10.50**	**3.20**

[1] Based on 9,190 dscf/10^6 Btu "F" factor, 5.94 % O_2 , 12.1% moisture, and 249 x 10^6 Btu/hr heat input.

[2] Based on 1997 RATA, average data for RA-79 through RA-87.

B. Stack Flow Rate Adjusted for Load

Unit	Load Ratio	Temperature		Flow Rate		Velocity		Height		Diameter	
		(°F)	(K)	(acfm)	(acmm)	(ft/sec)	(m/s)	(ft)	(m)	(ft)	(m)
7[1]	1.000	356.0	453.2	92,356.2	2,615.2	17.8	5.4	N/A	N/A	N/A	N/A
8[2]	1.250	252.3	395.5	198,967.1	5,634.1	38.3	11.7	N/A	N/A	N/A	N/A
Common		**285.2**	**413.8**	**291,323.3**	**8,249.4**	**56.1**	**17.1**	**200.0**	**61.0**	**10.50**	**3.20**

[1] Load ratio based on derate to 249 MMBtu/hr (22.9 MW).

[2] Load ratio based on design rate of 50 MW divided by rate occurring during RATA testing.

10/27/97
10:39:08

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

GRU KELLY PLANT; UNITS 7 & 8, SO2 IMPACTS

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	273.200
STACK HEIGHT (M)	=	61.0000
STK INSIDE DIAM (M)	=	3.2000
STK EXIT VELOCITY (M/S)	=	17.1000
STK GAS EXIT TEMP (K)	=	413.8000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	34.1000
MIN HORIZ BLDG DIM (M)	=	14.2000
MAX HORIZ BLDG DIM (M)	=	26.2000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 125.317 M**4/S**3; MOM. FLUX = 530.041 M**4/S**2.

*** FULL METEOROLOGY ***
****
*** SCREEN AUTOMATED DISTANCES ***
****
*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	1	1.0	1.1	681.0	679.95	30.91	28.30	NO
100.	295.8	4	20.0	26.2	6400.0	62.15	8.41	21.65	HS
200.	496.5	4	20.0	26.2	6400.0	66.01	15.85	28.43	HS
300.	631.5	4	20.0	26.2	6400.0	69.25	22.95	36.01	HS
400.	482.8	4	20.0	26.2	6400.0	72.14	29.83	38.01	HS
500.	393.6	4	20.0	26.2	6400.0	74.80	36.56	39.96	HS
600.	333.7	4	20.0	26.2	6400.0	77.29	43.17	41.86	HS
700.	344.0	1	3.0	3.4	960.0	267.32	161.26	219.81	NO
800.	471.3	1	1.5	1.7	480.0	473.63	206.85	305.78	NO
900.	543.6	1	1.5	1.7	480.0	473.63	223.76	381.79	NO
1000.	546.4	1	1.5	1.7	480.0	473.63	239.70	468.91	NO
1100.	520.4	1	1.5	1.7	480.0	473.63	255.78	567.67	NO
1200.	490.4	1	1.5	1.7	480.0	473.63	271.95	677.92	NO
1300.	462.9	1	1.5	1.7	480.0	473.63	288.16	799.57	NO
1400.	438.2	1	1.5	1.7	480.0	473.63	304.39	932.62	NO
1500.	416.0	1	1.5	1.7	480.0	473.63	320.61	1077.07	NO
1600.	396.0	1	1.5	1.7	480.0	473.63	336.83	1232.96	NO
1700.	377.8	1	1.5	1.7	480.0	473.63	353.01	1400.31	NO
1800.	361.3	1	1.5	1.7	480.0	473.63	369.16	1579.20	NO
1900.	346.3	1	1.0	1.1	681.0	679.95	407.19	1774.56	NO
2000.	333.9	1	1.0	1.1	681.0	679.95	422.42	1976.14	NO
2100.	322.2	1	1.0	1.1	681.0	679.95	437.65	2189.49	NO
2200.	311.4	1	1.0	1.1	681.0	679.95	452.90	2414.64	NO
2300.	301.3	1	1.0	1.1	681.0	679.95	468.13	2651.63	NO
2400.	291.8	1	1.0	1.1	681.0	679.95	483.36	2900.52	NO
2500.	283.2	2	1.5	1.7	480.0	473.63	367.71	321.10	NO
2600.	286.6	2	1.5	1.7	480.0	473.63	379.38	333.35	NO
2700.	288.4	2	1.5	1.7	480.0	473.63	391.03	345.71	NO
2800.	288.8	2	1.5	1.7	480.0	473.63	402.67	358.18	NO
2900.	288.1	2	1.5	1.7	480.0	473.63	414.28	370.74	NO

10/27/97
10:39:08

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

GRU KELLY PLANT; UNITS 7 & 8, SO2 IMPACTS

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
3000.	286.3	2	1.5	1.7	480.0	473.63	425.86	383.39	NO
3500.	268.4	2	1.5	1.7	480.0	473.63	483.42	447.83	NO
4000.	245.1	2	1.5	1.7	480.0	473.63	540.33	513.90	NO
4500.	223.2	2	1.5	1.7	480.0	473.63	596.59	581.27	NO
5000.	208.0	2	1.0	1.1	681.0	679.95	665.40	662.96	NO
MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 50. M:									
299.	633.5	4	20.0	26.2	6400.0	69.25	22.95	36.01	HS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	.2768E+05	CONC (UG/M**3)	=	.0000
CRIT WS @10M (M/S)	=	10.26	CRIT WS @10M (M/S)	=	99.99
CRIT WS @ HS (M/S)	=	14.73	CRIT WS @ HS (M/S)	=	99.99
DILUTION WS (M/S)	=	7.36	DILUTION WS (M/S)	=	99.99
CAVITY HT (M)	=	65.85	CAVITY HT (M)	=	54.20
CAVITY LENGTH (M)	=	64.59	CAVITY LENGTH (M)	=	26.91
ALONGWIND DIM (M)	=	14.20	ALONGWIND DIM (M)	=	26.20

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
END OF CAVITY CALCULATIONS

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)	
SIMPLE TERRAIN	633.5	299.	0.	
BLDG. CAVITY-1	.2768E+05	65.	--	(DIST = CAVITY LENGTH)
BLDG. CAVITY-2	.0000	27.	--	(DIST = CAVITY LENGTH)

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

ATTACHMENT 2

GRU's Proposed Revisions to Draft Title V Permit Conditions Based on Modeling Results and Comments to the Department's Response on GRU's Initial Comments

PAGE 2 – Subsection A. Facility Description

COMMENT NO. 1.: Revise the facility description in DEP's response to GRU's original Comment No. 5 as follows:

"This facility consists of 3 fossil fuel fired steam generators. The facility is fired with either natural gas or new No. 6 fuel oil which may be supplemented with on-specification used oil. Unit 6 is permitted to burn natural gas only."

PAGES 5 through 8 – Section III, Subsection A

COMMENT NO. 2.: Revise the emission unit description in DEP's response to GRU's original Comment No. 9 as follows:

" Fossil Fuel Fired Steam Generator Unit ~~1~~ 6. The emissions unit is fired on natural gas ~~or new No. 6 fuel oil which may be supplemented with on-specification used oil. The~~ with a maximum heat input ~~for natural gas and new No. 6 fuel oil is~~ of 187.3 MMBtu per hour..."

COMMENT NO. 3.: Revise Specific Condition A.1. in DEP's response to GRU's original Comment No. 10 as follows:

"Permitted Capacity: The maximum operation heat input rate based on the higher heating value of the fuel is as follows:

...	187.3	Natural Gas
	~~187.3~~	~~new No. 6 Fuel Oil~~
		~~on-specification used oil~~"

COMMENT NO. 4.: Revise Specific Condition A.3. in DEP's response to GRU's original Comment No. 11 as follows:

"Methods of Operation. Fuels.

~~a.~~ Startup: The only fuels allowed to be burned ~~are~~ is natural gas ~~and/or new No. 6 fuel oil, which may be supplemented with on-specification used oil with a PCB concentration of less than 2 ppm~~.

b. Normal. The only fuels allowed to be burned ~~are~~ is natural gas ~~and/or new No. 6 fuel oil, which may be supplemented with on-specification used oil with a PCB concentration of less than 50 ppm~~."

COMMENT NO. 5.: Revise Specific Condition A.6. in DEP's response to GRU's original Comment No. 13 as follows:

"Particulate Matter: Particulate matter emissions shall be controlled by the firing of natural gas ~~and/or new No. 6 fuel oil or on specification used oil containing no more than 1.5% sulfur, by weight~~."

COMMENT NO. 6.: Revise Specific Condition A.8 in DEP's response to GRU's original Comment No. 14 as follows:

"Sulfur Dioxide. Sulfur dioxide emissions shall be controlled by the firing of natural gas ~~and/or liquid fuels containing no more than 1.5% sulfur, by weight~~. [Rule 62-296.406(3), F.A.C.~~, and, BACT dated October 9, 1991.~~]"

COMMENT NO. 7.: Delete Specific Conditions A.10. and A.11. in DEP's response to GRU's original Comment No. 16. These conditions deal with sulfur analysis for liquid fuel and would no longer be applicable based on the proposed changes contained herein.

COMMENT NO. 8.: Revise Specific Condition A.13. in DEP's response to GRU's original Comment No. 19 as follows:

"...
a) only gaseous fuel(s)~~; or~~
~~b) only liquid fuel(s) for less than 400 hours per calendar year.~~"

PAGE 9 – Subsection B

COMMENT NO. 9.: Revise the emission unit descriptions in DEP's response to GRU's original Comment No. 21 as indicated below. Note that the description in this section does not indicate that on-specification used oil is burned in these units.

"...Fossil Fuel Fired Steam Generator Unit 8...However, equipment is installed to continuously monitor ~~visible emissions~~ opacity, carbon dioxide, sulfur dioxide and ~~flow rates~~ nitrous oxides."

COMMENT NO. 10.: Revise the permitting notes in DEP'S response to GRU'S original Comment No. 22 as indicated below.

"{Permitting note(s): The emissions units are regulated under ...~~;and Best Available Control Technology (BACT) Determination , dated October 9, 1991~~...."

COMMENT NO. 11.: Revise Condition B.1. in DEP'S response to GRU'S original Comment No. 23 as indicated below. GRU previously requested this clarification, but it appears to have been omitted.

"...The maximum operation heat input rate for Unit 8 will not be based on the continuous emission monitoring system."

COMMENT NO. 12.: Confirm that old Conditions B.7 and B.8. (new Conditions B.6. and B.7.) are as indicated in their original form in the draft Title V permit.

COMMENT NO. 13.: Revise Condition B.8 in DEP'S response to GRU'S original Comment No. 29 as indicated below based on the recent modeling.
"Sulfur Dioxide. Sulfur dioxide emissions from each unit shall not exceed 2.75 pounds per million Btu heat input. ~~be controlled by the firing of natural gas and/or~~ The sulfur content of liquid fuels shall not exceed ~~containing no more than 1~~ 2.5 % sulfur, by weight. [~~BACT dated October 9, 1991~~]"

COMMENT NO. 14.: Revise Condition B.9. in DEP'S response to GRU'S original Comment No. 30 as indicated below. GRU is proposing to demonstrate compliance with the sulfur dioxide limit by ensuring that the sulfur content of delivered fuel does not exceed 2.5%. There is no basis for requiring additional testing on blended fuels. The proposed condition is contained in other Title V permits and should provide reasonable assurances of compliance with the sulfur dioxide limits. Alternatively, the SO2 CEMs could be used for demonstrating compliance on Unit 8.

"Sulfur Dioxide....upon each fuel delivery ~~and upon any liquid fuels blended on site~~...devices. Alternatively, the permittee may use a CEMs to demonstrate compliance."

COMMENT NO. 15.: Delete Condition B.14. in DEP'S response to GRU'S original Comment No. 35 and replace it with the following:

"Fuel sampling and percent sulfur analysis shall be conducted using either ASTM D2622-92, ASTM D4292-90, ASTM D1552-90, ASTM D4177-82 or both ASTM D4057-88 and ASTM D129-91 or the latest edition of the above ASTM."
[Rule 61-213.440, 62-296.405(1)(e)3, 62-296.405(1)(f)1.b. and 62-297.440, F.A.C.]

COMMENT NO. 16.: Revise Condition B.19 in DEP'S response to GRU'S original Comment No. 36 as indicated below to address co-firing of gaseous and liquid fuels and the limitation on hours of firing fuels contained in Rule 62-297.310(7)(a)(5).

"By this permit, ...
a. ...
b. only liquid fuels, other than during startup, for ~~less~~ no more than 400 hours per year, or
c. gaseous fuels in combination with any amount of liquid fuels, other than during startup, for no more than 400 hours per year."

COMMENT NO. 17.: Revise Condition B.20. in DEP'S response to GRU'S original Comment No. 37 as indicated below for the reasons stated above.

"Annual and permit renewal...
a. ...
b. only liquid fuels, other than during startup, for ~~less~~ no more than 400 hours per year, or
c. gaseous fuels in combination with any amount of liquid fuels, other than during startup, for no more than 400 hours per year."

COMMENT NO. 18.: Revise Condition B.21 (original Condition B.20) in DEP'S response to GRU'S original Comment No. 38 as indicated below. Based on the recent modeling both Unit 7 and 8 will be subject to the reporting provisions of Rule 62-296.405(1)(g) for SO2 only.

"~~For Unit 8, s~~Submit..."

COMMENT NO. 19.: Revise Condition C.11.e. in DEP's response to GRU's original Comment No. 40 as indicated below. There is no reason to sample every batch of used oil for every parameter. For example, if there are no halogenated substances managed at a facility generating used oil, it would be reasonable to assume that halogens would not be present in the used oil. Likewise, if used oil from a particular source had previously been characterized as on-specification (based on analyses) and the process had not changed, it would be reasonable to expect future batches of used oil to be of similar character.

"(3) Alternatively, the owner or operator may ~~obtain~~ rely on other ~~copies of~~ analyses or other information ~~documenting~~ to make a determination that the used oil fuel meets the specifications in 40 CFR 279.11."

COMMENT NO. 20.: In Condition C.11.g. in DEP'S response to GRU'S original Comment No. 43 GRU again respectfully requests that the *quarterly* reporting requirement on the amount of on-specification used oil placed in inventory be deleted. Notwithstanding that there is no regulatory basis for this requirement, this reporting will be administratively burdensome and will not have any environmental benefit. *If the Department retains this requirement, the permit condition should clarify that if no used oil is placed in inventory then no report is required.* This would ease the reporting burden somewhat.

COMMENT NO. 21.: Revise Appendix E-1 in DEP's response to GRU's original Comment No. 49 as indicated below. The tank changes were inadvertently omitted in the original comments. As long as the potential for hazardous air pollutant emissions from the degreasing units is below the thresholds in Rule 62-213.430(6), the units should qualify as exempt units.

13. Degreasing units using heavier-than air vapors ~~exclusively, except any such unit using or emitting any substance classified as a hazardous air pollutant~~

18. Two 115,000 (nominal) gallon storage tanks for new No. 2 fuel oil or new No. 6 fuel oil/on-specification used oil

19. Two 54,00 (nominal) gallon storage tanks for new No. 6 fuel oil/on-specification used or new No. 2 fuel oil."

COMMENT NO. 22.: Revise Table 1-1, Summary of Air Pollutant Standards and Terms to be consistent with the proposed SO2 limit (2.75 lb/MMBtu or 2.5% sulfur, by weight) for Units 7 and 8 based on the recent modeling results.

COMMENT NO. 23.: Delete Table 2-1 for Unit 6. This table will no longer be applicable if Unit 6 does not burn fuel oil.

COMMENT NO. 24.: Revise Table 2-1 for Units 7 and 8 to include all the ASTM methods for fuel sampling an analyses referenced in Condition b.14.

COMMENT NO. 25.: Based on DEP's responses to GRU's original comments, GRU understands that the following items are still pending:

a. The definition of "new" as it describes fuel oil (GRU original Comment No. 4).
b. The limitation on the origin of on-specification used oil (GRU original Comment No. 39).
c. The designation of conditions as "Not Federally Enforceable" (GRU original Comment No. 50).
d. Submittal by GRU of the ductwork configuration of Units 7 and 8 to the common stack.