building a world of difference™ | BLACK & VEATCH

09/2001

Additional SO_2 Class I Increment Analysis for the JEA-Brandy Branch Combined Cycle Conversion Project

September 2001

Executive Summary

On July 18, 2001, EPA Region 4 provided written comments to the Florida Department of Environmental Protection (FDEP) on the draft permit issued by the FDEP for the Brandy Branch Combined Cycle Conversion Project. Contrary to the FDEP's determination, the EPA does not view the proposed conversion of two of the three already-permitted simple cycle turbines to combined cycle operation as a modification with respect to Prevention of Significant (PSD) air permitting applicability. In their letter to the FDEP, the EPA views the project as a change in the design of the entire facility, and although air dispersion modeling was performed for the proposed conversion of two simple cycle turbines to combined cycle operation per FDEP guidance, the remaining simple cycle turbine should also be included in the modeling analysis. Therefore, at the request of the FDEP, a cumulative source sulfur dioxide (SO_2) Class I area impact analysis was performed to demonstrate that the modeled air quality impacts of the project, including the unconverted simple cycle combustion turbine, will not contribute to or cause a Class I SO_2 increment violation.

Specifically, cumulative source SO_2 model predicted impacts were determined for the Okefenokee National Wildlife Refuge (ONWR) area, which is a Prevention of Significant Deterioration (PSD) Class I area located in southeastern Georgia, approximately 34 km north-northwest of the proposed project site. In addition to the impacts on the ONWR, cumulative source SO_2 model predicted impacts at the Wolf Island National Wildlife Refuge (WINWR), another PSD Class I area located 127 km north-northeast of the project site were also assessed.

Modeling was performed using EPA approved air dispersion models for the following operating scenarios:

- All combustion turbines (two combined cycle turbines and one simple cycle turbine) operating on 0.04 percent sulfur fuel oil. (The simple cycle turbine is permitted to operate no more than 16 hours per day on fuel oil with the remainder on natural gas).
- Any two combustion turbines operating on 0.05 percent fuel oil. (The simple cycle turbine is permitted to operate no more than 16 hours per day on fuel oil with the remainder on natural gas).
- The two combined cycle turbines operating 18 hours per day and the simple cycle turbine operating 16 hours per day on fuel oil with 0.05 percent sulfur.

Results of the Class I SO_2 increment air dispersion modeling demonstrate that the project will not cause or contribute to a violation of the SO_2 Class I increments for any of the aforementioned operating scenarios.

1.0 Cumulative Class I Area Impact Analysis

The cumulative source sulfur dioxide (SO_2) Class I area impact analysis presented in the following sections is performed at the request of the Florida Department of Environmental Protection (FDEP) in order to facilitate a response to EPA's comments on the draft PSD permit issued for the JEA Brandy Branch Combined Cycle Project (hereinafter referred to as the project).

1.1 Background Information

On July 18, 2001, EPA Region 4 provided comments to the FDEP on the draft PSD permit for the project. A copy of the letter is provided in Attachment A. In pre-application discussions regarding the air permitting methodology and air dispersion modeling protocol, the FDEP determined that the proposed combined cycle conversion of two simple cycle turbines at the Brandy Branch facility comprised a modification of an existing major source in terms of the PSD air permitting applicability. The existing major source was permitted to operate as a three unit simple cycle electric generating facility. The conversion of two of the three simple cycle turbines to combined cycle operation constitutes the project.

The EPA, disagreed with FDEP's conclusion that the project is a PSD modification, and stated that the proposed conversion to combined cycle of two of the three combustion turbines is a change in the original design of the entire facility. Although air dispersion modeling was performed for the combined cycle portion of the project per FDEP guidance, the EPA felt that the simple cycle combustion turbine should also be included in the air dispersion modeling analyses. Specifically, the EPA indicated that the simple cycle combustion turbines were not operational at the time the permit application for the combined cycle conversion project was submitted, and therefore should have been included in the air dispersion modeling analyses with the combined cycle turbines.

Based on EPA's comments, the FDEP performed additional air dispersion modeling to demonstrate that the project would still meet air quality impact thresholds with the simple cycle combustion turbine included in the air dispersion modeling analyses. The FDEP also requested that JEA perform a Class I area increment analysis for SO_2 (including the simple cycle combustion turbine with the combined cycle combustion turbines), as their preliminary modeling indicated that the model predicted impacts were above the applicable Class I significant impact levels (SILs). Specifically, the FDEP requested that a Class I SO2 increment analysis be performed for the Okefenokee National Wildlife Refuge (ONWR) and the Wolf Island National Wildlife Refuge (WINWR). The location of the project with respect to the ONWR and WINWR Class I areas is presented in Figure 1-1. The FDEP provided a list of PSD increment consuming sources for inclusion in the modeling. A list of the sources provided by FDEP is included in Attachment B.

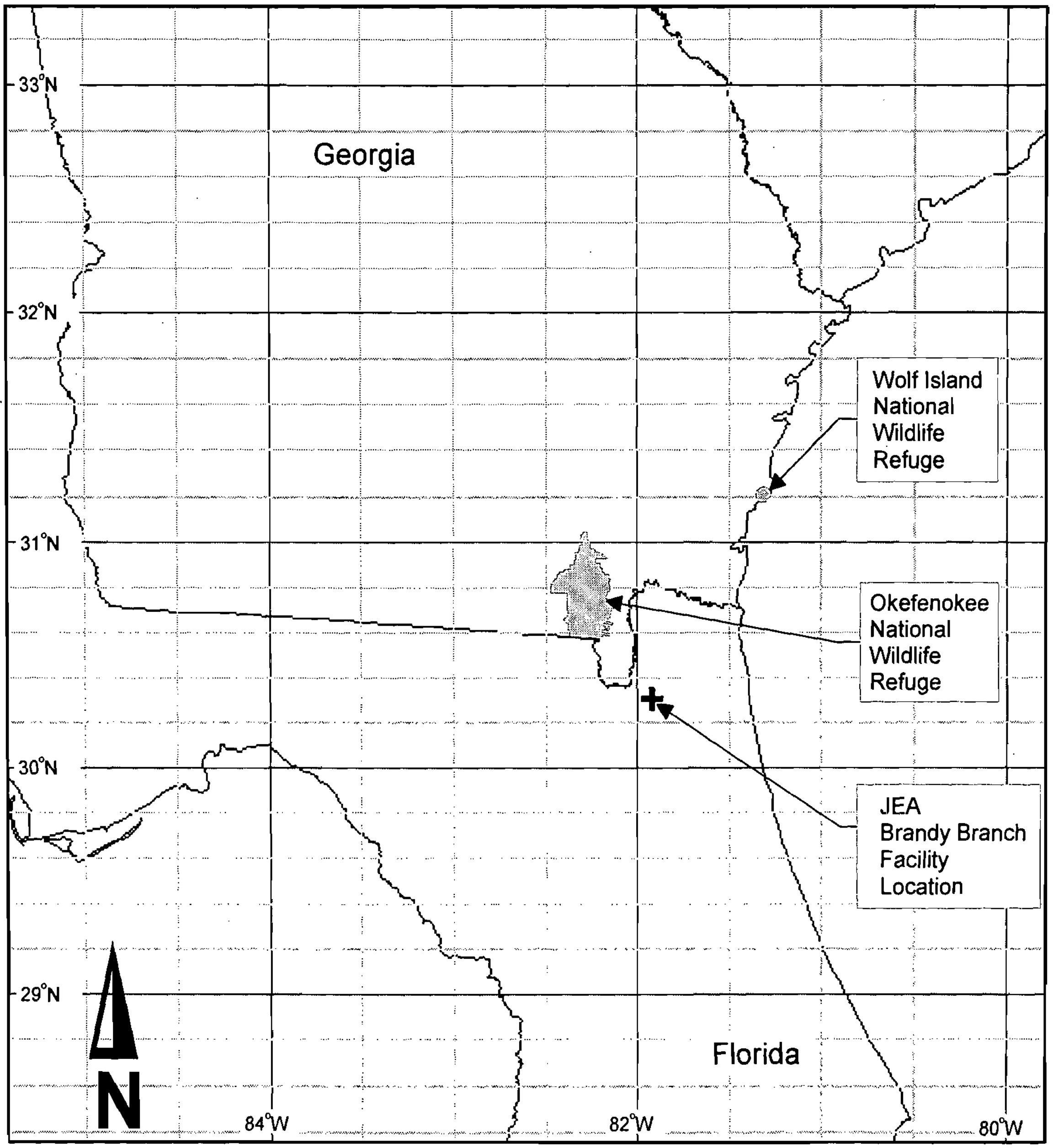
1.2 Modeling Guidance Documents

The analyses follow the procedures recommended in the *Interagency Workgroup on Air Quality Modeling (IWAQM) Phase I & II* reports dated April 1993 and December 1998 (respectively), the *Draft Phase I Federal Land Managers' Air Quality Related Values Workgroup (FLAG)* dated October 1999, *EPA's Workbook for Plume Visual Impact Screening and Analysis* dated September 1988, as well as coordination with the FDEP who has communicated as necessary with the U.S. Fish and Wildlife Service (FWS) which is the Federal Land Manager (FLM) for both areas. In addition to presenting the modeled impacts, this document includes a discussion of the meteorological and geophysical databases used in the analysis, the preparation of those databases for introduction into the modeling system, and the air modeling approach.

1.3 Model Selection and Inputs

The Industrial Source Complex Short-Term (ISCST3 Version 00101) air dispersion model was used to characterize pollutant impacts onto those portions of the Class I areas that lie within 50 km of the proposed site (i.e., ONWR). The ISCST3 model is an EPA approved, steady-state, straight-line Gaussian plume model, which may be used to assess pollutant concentrations from a wide variety of sources associated with an industrial source complex. The ISCST3 air dispersion model was used to determine the maximum ground level impacts of SO_2.

The California Puff (CALPUFF, version 5.4) air modeling system was used to assess the ground level impacts of SO_2 at those portions of ONWR and WINWR that lie beyond 50 km from the proposed site. CALPUFF is a non-steady state, Lagrangian, Gaussian puff long-range transport model that includes algorithms for building downwash effects as well as chemical transformations (important for visibility controlling pollutants), and wet/dry deposition. The CALMET model, a preprocessor to CALPUFF, is a diagnostic meteorological model that produces a three-dimensional field of wind and temperature and a two-dimensional field of other meteorological parameters. Simply, CALMET was designed to process raw meteorological, terrain, and land-use databases to be used in the air modeling analysis.



Location of Brandy Branch Facility
with Respect to
Okefenokee and Wolf Island
National Wildlife Refuges

Figure 1-1

Site wrt Class I areas.srf

The CALPUFF modeling system uses a number of FORTRAN preprocessor programs that extract data from large databases and converts the data into formats suitable for input to CALMET. For the refined analyses, the processed data produced from CALMET was input to CALPUFF to assess pollutant specific impacts. Both CALMET and CALPUFF was used in a manner that is recommended by the IWAQM Phase I and II reports and Draft Phase I FLAG report.

1.3.1. CALPUFF Model Settings

The CALPUFF settings contained in Table 1-1 were used for the modeling analyses.

1.3.2 Building Wake Effects

The ISCST3 modeling as well as the refined CALPUFF analyses include the proposed facility's building dimensions to account for the effects of building-induced downwash on the emission sources. Dimensions for all significant building structures were processed with the Building Profile Input Program (BPIP), Version 95086, and included in the CALPUFF model input.

1.3.3 Receptor Locations

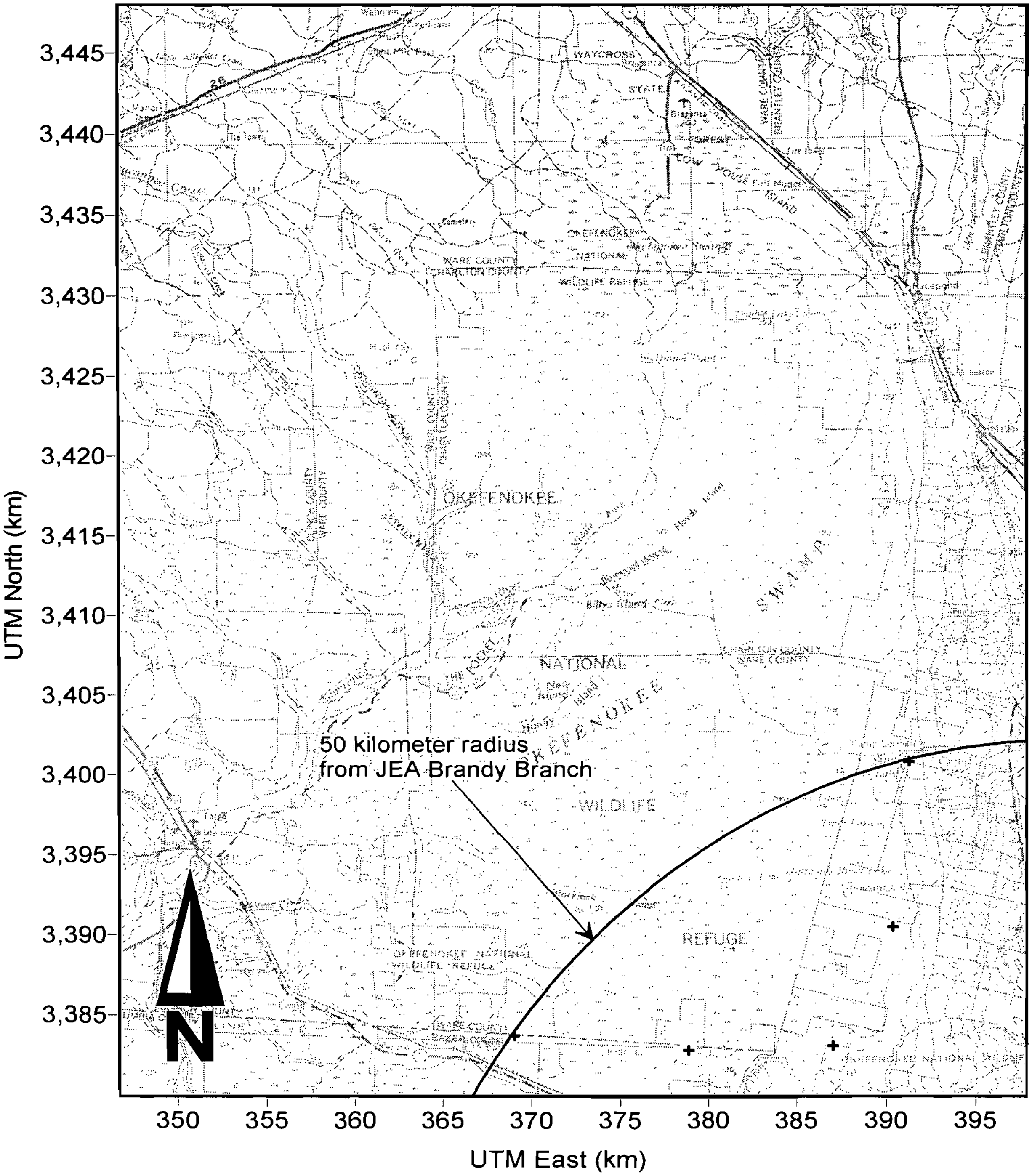
The ISCST3 analysis used a set of 5 discrete receptors placed along the closest boundary of that portion of the ONWR that lies within 50 km of the proposed site. The ISCST3 receptors are shown in Figure 1-2. The refined CALPUFF analysis used an array of discrete receptors at appropriate distances to ensure sufficient density and aerial extent to adequately characterize the pattern of pollutant impacts in the ONWR and WINWR. Specifically, the array consists of receptor spacing of 2 km within the ONWR beginning at a distance of 50 km from the proposed project location and continuing to the farthest extent of the ONWR. The refined CALPUFF receptors on the ONWR are shown in Figure 1-3. Due to its size, only four discrete receptors were placed at WINWR. The receptors were spaced to adequately cover the extent of the area for modeling purposes.

1.3.4 Meteorological Data Processing

The meteorological data used in the ISC modeling consists of 5 years of surface observations (1984-1988) for Jacksonville, Florida extracted from the National Climatic Data Center's (NCDC) Solar and Meteorological Surface Observational Network (SAMSON) CD-ROM set. These five years were combined with upper air, twice-daily mixing height data from Waycross, Georgia downloaded from the SCRAM BBS for the same five-year period. Both data sets were processed with PCRammet. The refined CALPUFF analysis employed the California Puff meteorological and geophysical data preprocessor (CALMET, Version 5.2) to develop the gridded parameter fields required for the refined modeling analysis. The following sections discuss the data used and processed in the CALMET model.

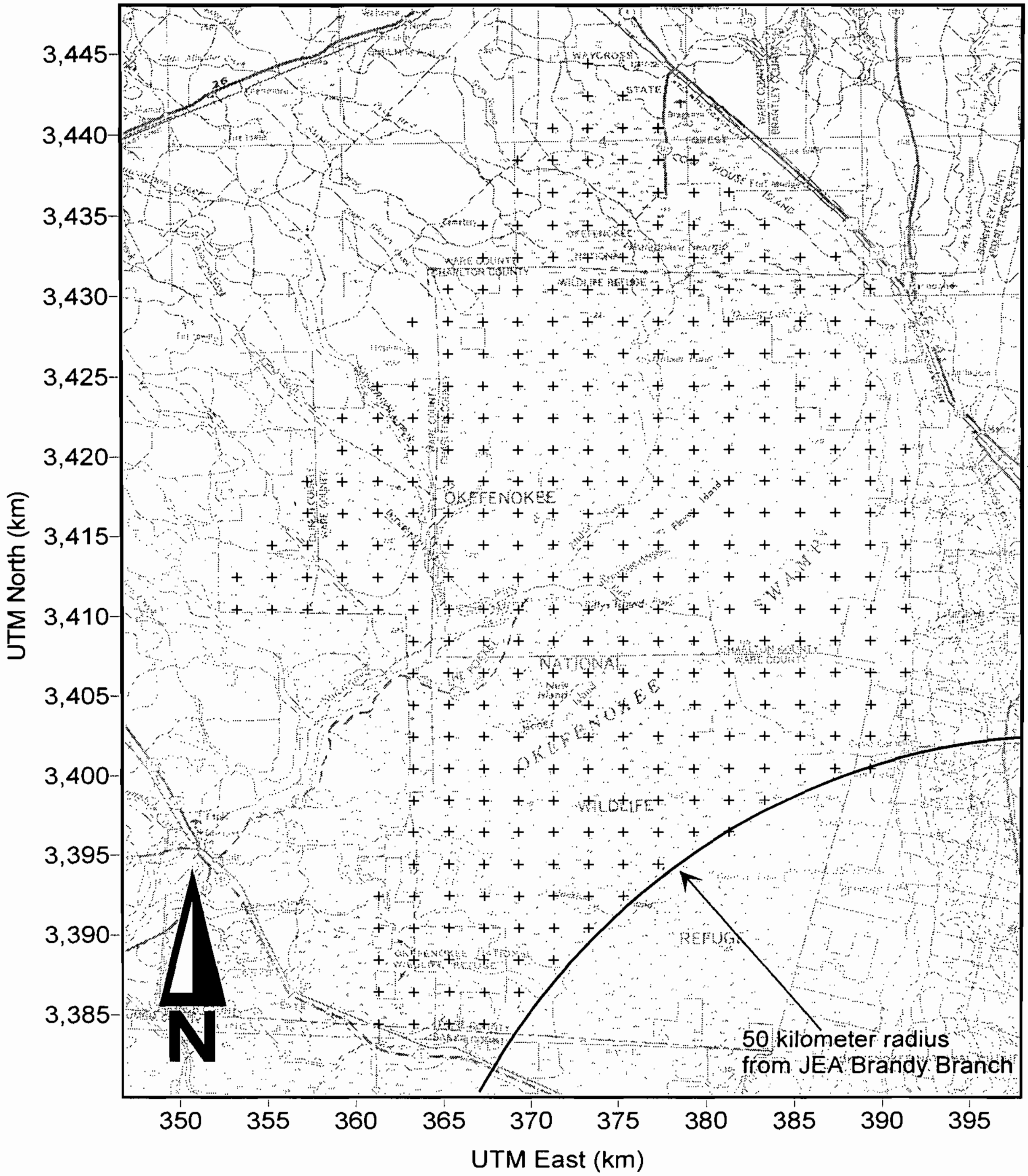
Table 1-1 CALPUFF Model Settings	
Parameter	**Setting**
Pollutant Species	SO_2, SO_4, NO_x[1], HNO_3[1], and NO_3[1], and PM_{10}[1]
Chemical Transformation	MESOPUFF II scheme
Deposition	Include both dry and wet deposition, plume depletion
Meteorological/Land Use Input	CALMET
Plume Rise	Transitional, Stack-tip downwash, Partial plume penetration
Dispersion	Puff plume element, PG/MP coefficients, rural mode, ISC building downwash scheme.
Terrain Effects	Partial plume path adjustment.
Output	Create binary concentration and wet/dry deposition files including output species for all pollutants.
Model Processing	Class I SILs: Highest predicted concentrations of SO_2
Background Values	Refined: Ozone = 60 ppb; Ammonia = 3 ppb

Note:
[1] The pollutant species were included in the modeling due to requirements of the CALPUFF modeling system. However, the modeling results are not reported.



ISCST3 Receptors
for Class I SILs Modeling
within 50 km of the Site

Figure 1-2



Dense 2 km Receptor Grid for Refined CALPUFF Modeling

Figure 1- 3

Oke Refined Receptors.srf

1.3.5 CALMET Settings

The CALMET settings, including horizontal and vertical grid coverage, number of weather stations (surface, upper air, and precipitation), and resolution of prognostic mesoscale meteorological data, are contained in Table 1-2.

1.3.6 Modeling Domain

A rectangular modeling domain extending 325 km in the east-west (x) direction and 250 km in the north-south (y) direction was used for the refined modeling analysis. The boundary of the domain is represented by the dashed line in Figure 1-4. The southwest corner of the domain is the origin and is located at 29.25 N degrees latitude and 84 W degrees longitude. This location is in the northeastern Gulf of Mexico approximately 140 km due south of Tallahassee. The size of the domain used for the modeling was based on the distances needed to cover the area from the proposed project to the receptors at the ONWR with an 80-km buffer zone in each direction.

For the processing of meteorological and geophysical data, 65 grid cells were used in the x-direction and 50 grid cells were used in the y-direction. A 5-km grid spacing was used. The air modeling analysis was performed in the UTM coordinate system.

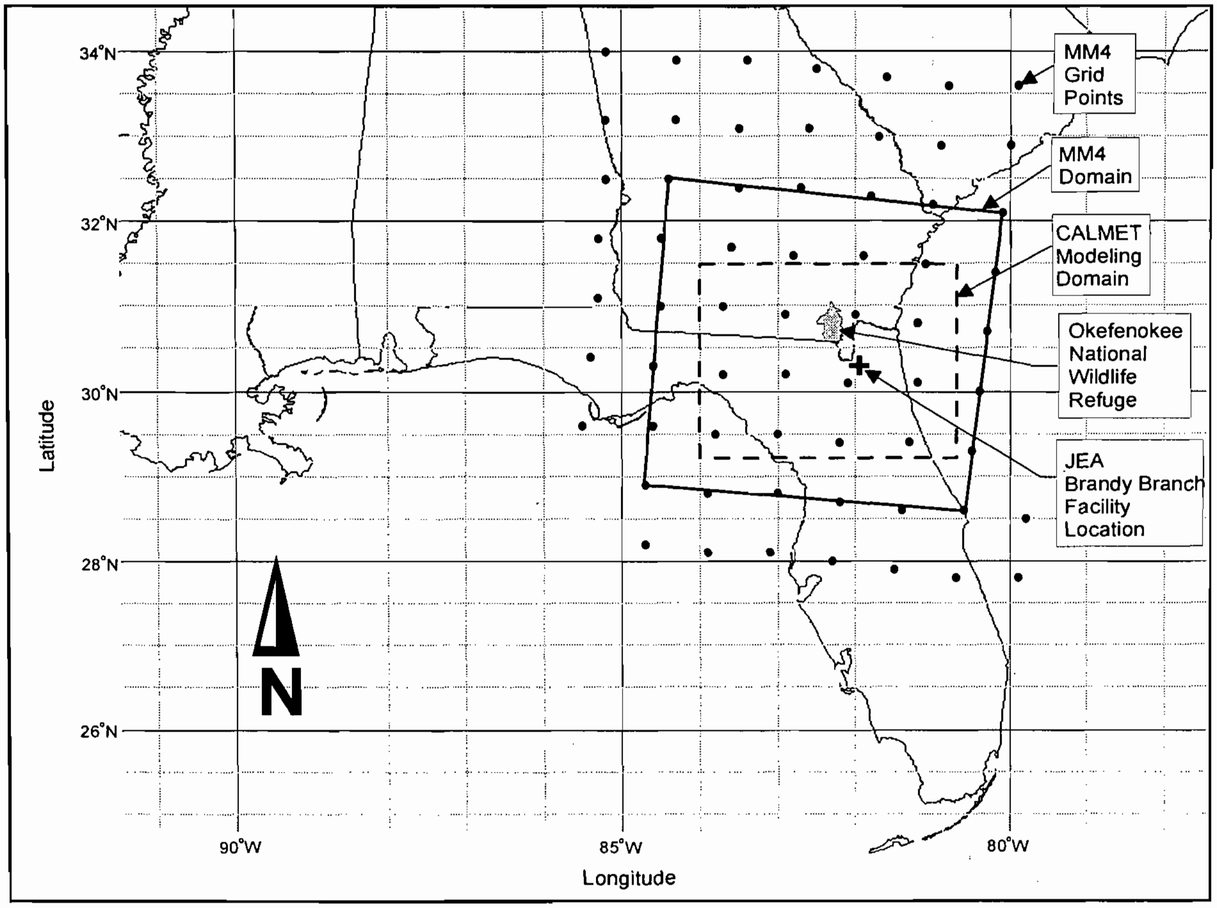
1.3.7 Mesoscale Model Data

Pennsylvania State University in conjunction with the NCAR Assessment Laboratory developed the MM4 data set, a prognostic wind field or "guess" field, for the United States. The hourly meteorological variables used to create this data set (wind, temperature, dew point depression, and geopotential height for eight standard levels and up to 15 significant levels) are extensive and only allow for one data base set for the year 1990. The analysis used the MM4 data to initialize the CALMET wind field. The MM4 data have a horizontal spacing of 80 km and are used to simulate atmospheric variables within the modeling domain.

To apply a national MM4 dataset to the modeling domain, a sub-set domain was developed that fully enclosed the area of the modeling domain. The MM4 subset domain consisted of a 6 x 6-cell rectangle, with 80 km grid resolution, extending from the MM4 grid points (49,13) to (54, 18). These data were processed to create a MM4.Dat file, for input to the CALMET model. The MM4 subset domain is represented by the solid line rectangle in Figure 1-4.

Table 1-2
CALMET Settings

PARAMETER	SETTING
Horizontal Grid Dimensions	325 by 250 km, 5 km grid resolution
Vertical Grid	8 layers
Weather Station Data Inputs	8 surface, 5 upper air, 35 precipitation stations
Wind model options	Diagnostic wind model, no kinematic effects
Prognostic wind field model	MM4 data, 80 km resolution, 6 x 6 grid, used for wind field initialization
Output	Binary hourly gridded meteorological data file for CALPUFF input



Domain.srf

CALMET Domain

Figure 1-4

The MM4 data set used in CALMET, although advanced, lacks the fine detail of specific temporal and spatial meteorological variables and geophysical data. These variables were processed into the appropriate format and introduced into the CALMET model through the additional data files obtained from the following sources.

1.3.8 Surface Data Stations and Processing

The surface station data processed for the refined CALPUFF analysis consisted of data from eight National Weather Service (NWS) stations or Federal Aviation Administration (FAA) Flight Service stations for Jacksonville, Tallahassee, Gainesville, Tampa and Daytona Beach (FL) and Columbus, Macon and Savannah (GA). A summary of the surface station information and locations are presented in Table 1-3 and Figure 1-5, respectively. The surface station parameters include wind speed, wind direction, cloud ceiling height, opaque cloud cover, dry bulb temperature, relative humidity, station pressure, and a precipitation code that is based on current weather conditions.

The weather station data for all stations but Gainesville was downloaded for the year 1990 from the National Climatic Data Center's (NCDC) Solar and Meteorological Surface Observational Network (SAMSON) CD-ROM set. The surface data from Gainesville was processed from NCDC CD-144 format. The data was processed with the CALMET preprocessor utility program, SMERGE, to create one surface file, SURF.DAT.

1.3.9 Upper Air Data Stations and Processing

The analysis included five upper air NWS stations located in Ruskin and Apalachicola (FL), Athens and Waycross (GA), and Charleston (SC). Data for these stations was obtained from the NCDC Radiosonde Data CD and processed into the NCDC Tape Deck (TD) 6201 format by the READ62 utility program for input to CALMET. The data and locations for the upper air stations are presented in Table 1-3 and Figure 1-5, respectively.

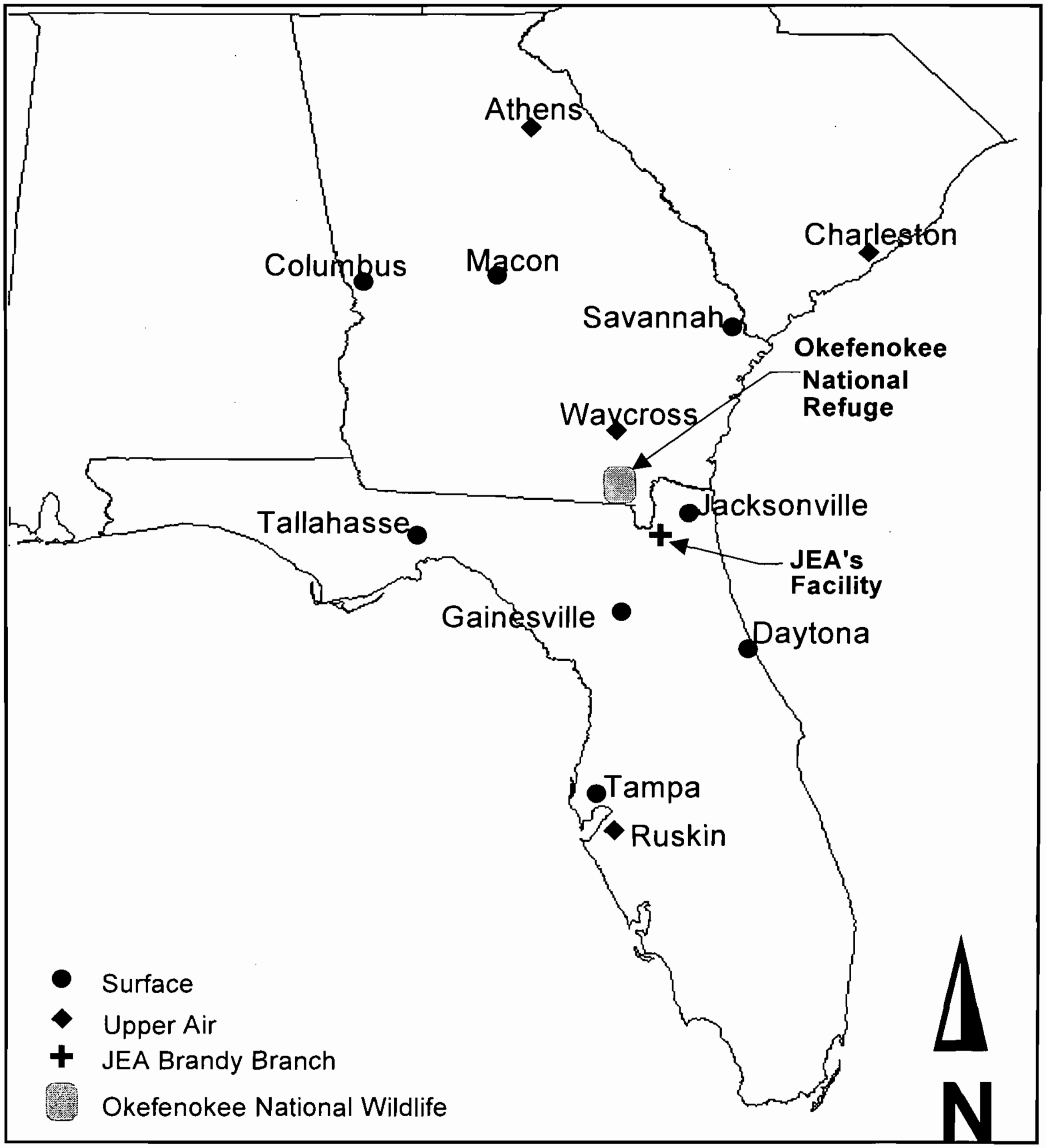
1.3.10 Precipitation Data Stations and Processing

Precipitation data was processed from a network of hourly precipitation data files collected from primary and secondary NWS precipitation recording stations located in southern Georgia and northern Florida. Data for 35 stations within or just beyond the modeling domain (dashed rectangular box in Figure 1-4) were obtained in NCDC TD-3240 variable format and converted into a fixed-length format.

Table 1-3
Surface and Upper Air Stations Used in the CALPUFF Analysis

Station Name	Station Symbol	WBAN Number	UTM Coordinates			Anemometer Height (m)
			Easting (km)	Northing (km)	Zone	
Surface Stations						
Tampa, FL	TPA	12842	349.17	3094.25	17	6.7
Jacksonville, FL	JAX	13889	432.82	3374.19	17	6.1
Daytona Beach, FL	DAB	12834	495.14	3228.09	17	9.1
Tallahassee, FL	TLH	93805	173.04[a]	3363.99	16	7.6
Columbus, GA	COL	93842	112.57[a]	3599.35	16	9.1
Macon, GA	MCN	03813	251.58	3620.93	17	7.0
Savannah, GA	SAV	03822	481.13	3555.03	17	9.1
Gainesville, FL	GNV	12816	377.43	3284.16	17	6.7
Upper Air Stations						
Ruskin, FL	TBW	12842	361.95	3064.55	17	NA
Waycross, GA	AYS	13861	366.68	3457.95	17	NA
Athens, GA	AHN	13873	285.91	3758.83	17	NA
Charleston, SC	CHS	13880	590.42	3640.42	17	NA
Apalachicola, FL	AQQ	12832	110.22	3290.65	17	NA

[a] Equivalent Coordinate for Zone 17



National Weather
Meteorological Surface & Upper Air
Used in the CALMET

Figure 1- 5

Met

The utility programs PXTRACT and PMERGE were used to process the data into the format for the Precip.Dat file that is used by CALMET. A listing of the precipitation stations used for the modeling analysis is presented in Table 1-4.

1.3.11 Geophysical Data Processing

Terrain elevations for each grid cell of the modeling domain were obtained from Digital Elevation Model (DEM) files obtained from US Geographical Survey (USGS). The DEM data was extracted for the modeling domain grid using the utility extraction program LCELEV. Land-use data was obtained from the USGS GIS.DAT which is based on the ARM3 data. The resolution of the GIS.DAT file is one-eighth of a degree in the east-west direction and one-twelfth of a degree in the north-south direction. Land-use values for the domain grid were obtained with the utility program CAL-LAND. Other parameters processed for the modeling domain by CAL-LAND include surface roughness, surface albedo, Bowen ratio, soil heat flux, and leaf index field. Once processed, all of the land-use parameters were combined with the terrain information into a GEO.DAT file for input to CALMET. The land-use parameter values were based on annual averaged values.

1.3.12 Modeling Scenarios

The following sections present the operating scenarios that were modeled for the project for the ISCST3 and CALPUFF modeling.

1.3.12.1 ISCST3 Modeling Scenario

The following scenario was modeled using the ISCST3 model.

- Both combined cycle turbines operating on 0.05 percent fuel oil for 24 hours a day, 8,760 hours per year. The simple cycle turbine operating on 0.05 percent fuel oil 16 hours per day, for a total of 750 hours per year and operating on natural gas for a total of 4,000 hours per year as limited by the construction permit. The simple cycle turbine is permitted to operate for 4,750 hours per year on either natural gas or fuel oil with a maximum of 750 hours per year and no more than 16 hours per day on fuel oil.

1.3.12.2 CALPUFF Modeling Scenarios

The following scenarios were modeled using the CALPUFF model.

- Scenario 1: Both combined cycle turbines operating on 0.04 percent fuel oil for 24 hours a day, 8,760 hours per year. The simple cycle turbine operating on 0.04 percent fuel oil 16 hours per day, for a total of 750 hours per year and operating on natural gas for a total of 4,000 hours per year as limited by the construction permit.

Table 1-4
Hourly Precipitation Stations Used in the CALPUFF Analysis

Station Name	Station Number	UTM Coordinates		
		Easting (km)	Northing (km)	Zone
Florida				
Branford	80975	315.61	3315.96	17
Bristol	81020	113.72[a]	3366.47	16
Brooksville 7 SSW	81048	358.03	3149.55	17
Cross city 2 WNW	82008	290.27	3281.75	17
Daytona Beach WSO AP	82158	495.14	3228.09	17
Deland 1 SSE	82229	470.78	3209.66	17
Dowling Park 1 W	82391	283.51	3348.42	17
Gainesville 11 WNW	83322	354.85	3284.43	17
Inglis 3 E	84273	342.63	3211.65	17
Jacksonville WSO AP	84358	434.27	3372.40	17
Lakeland	84797	409.87	3099.18	17
Lisbon	85076	423.59	3193.26	17
Lynne	85237	409.26	3230.30	17
Marineland	85391	479.19	3282.03	17
Melbourne WSO	85612	534.38	3109.97	17
Monticello 3 W	85879	220.17	3381.29	17
Orlando WSO McCoy	86628	468.99	3146.88	17
Panacea 3 s	86828	172.45[a]	3319.61	16
Raiford State Prison	87440	385.93	3326.55	17
Saint Leo	87851	376.48	3135.09	17
Tallahassee WSO AP	88758	173.04[a]	3363.99	16
Woodruff Dam	89795	124.29[a]	3399.94	16
Georgia				
Abbeville 4 S	90010	281.84	3535.69	17
Bainbridge Intl Paper Co	90586	144.85[a]	3409.59	16
Brunswick	91340	452.34	3447.98	17
Coolidge	92238	226.34	3434.77	17
Doles	92728	226.73	3510.59	17
Edison	93028	135.13[a]	3494.43	16
Fargo	93312	349.92	3395.35	17
Folkston 3 SW	93460	401.13	3407.69	17
Hazlehurst	94204	348.49	3526.08	17
Jesup	94671	416.21	3498.08	17
Pearson	96879	325.50	3464.09	17
Richmond Hill	97468	468.92	3535.69	17
Valdosta 4 NW	98974	276.90	3416.95	17

[a] Equivalent Coordinate for Zone 17

- Scenario 2: One combined cycle turbine operating on 0.05 percent fuel oil for 24 hours a day and the other on natural gas, 8,760 hours per year. The simple cycle turbine operating on 0.05 percent fuel oil 16 hours per day, for a total of 750 hours per year and operating on natural gas for a total of 4,000 hours per year as limited by the construction permit.
- Scenario 3: Both combined cycle turbines operating on 0.05 percent fuel oil for 24 hours a day, 8,760 hours per year. The simple cycle turbine operating on natural gas 24 hours per day for a total of 4,750 hours per year as limited by the construction permit.
- Scenario 4: Both combined cycle turbines operating on 0.05 percent fuel oil for 18 hours a day and the remainder on natural gas, 8,760 hours per year. The simple cycle turbine operating on 0.05 percent fuel oil 16 hours per day, for a total of 750 hours per year and operating on natural gas for a total of 4,000 hours per year as limited by the construction permit.

1.3.13 Stack Parameters and Emissions

Performance data for the project was based on vendor data at certain design ambient temperatures at base load operation, considering both natural gas and distillate fuel oil firing. The maximum pound per hour emission rates considering three representative ambient temperatures at base load operation for natural gas and distillate fuel oil firing were used for the pollutants modeled. The stack parameters for both fuel oil and natural gas operation and emission rates for the modeled scenarios are listed in Tables 1-5, 1-6, and 1-7, respectively.

Tables 1-5 and 1-6 present the stack parameters for the combined cycle and simple cycle turbines for both fuel oil and natural gas operation, respectively. For short-term averaged modeling, the fuel oil operating parameters were used in cases where more than half of the day experienced oil firing. Otherwise the natural gas operating parameters were used in the modeling. For annual averaged modeling, the natural gas operating parameters were used in the modeling. Emission rates for all scenarios used in the modeling are presented in Table 1-7. Conservative emission rates were used when applicable. For instance, both the ISC and CALPUFF modeling used the highest pound per hour short-term emission rates for the 3-hour averaging period. However, for modeling the 24-hour averaging period, a combination of parameters that represented a worst case were used. The project's modeled impacts exceeded all necessary threshold values by simply accounting for the permitted daily fuel oil operating limitation (i.e., 16 hours per day) on the SCCT while the CCCTs operated the entire day on fuel oil. CALPUFF evaluated numerous daily operating scenarios, as discussed in Section 1.3.12.2 and as shown in Table 1-7, to demonstrate compliance with the applicable threshold values.

The results section of this document will demonstrate that all of the daily (i.e., 24-hour) emission scenarios listed in Table 1-7 comply with the applicable standards. That is, the CALPUFF modeling demonstrates that on a daily basis the project can operate the SCCT 16 hours/day on fuel oil (as permitted) and the CCCTs 24 hours/day on fuel oil while burning 0.04% sulfur fuel oil. All of the remaining modeled scenarios utilize 0.05% sulfur fuel oil. The modeling also demonstrates that the project can operate the SCCT 16 hours/day on fuel oil (as permitted), one CCCT on fuel oil 24 hours out of the day, with the second CCCT firing natural gas. Additionally, the project can operate the SCCT on natural gas while the two CCCTs are operating on fuel oil in any 24-hour period. These two scenarios indicate that the project has the ability to operate any two of the three combustion turbines on fuel oil for any given day (taking credit for the SCCTs permitted operating limit of 16 hours/day on fuel oil). One additional scenario indicates that the project can operate the SCCT 16 hours/day on fuel oil (as permitted) while operating the CCCTs 18 hours/day on fuel oil.

For the cumulative sources, stack parameters and emission data provided by the FDEP was used in the analysis. As mentioned earlier, a listing of the sources and modeling parameters is presented in Attachment B.

1.4 Class I Modeling Analyses

The preceding model inputs and settings for the ISCST3 and CALPUFF modeling system were used to complete the Class I analyses on the ONWR and WINWR for SO_2 Class I SILs. The following analyses were performed as described below regardless of the modeling methodology (i.e., ISCST3 or CALPUFF).

Table 1-5 Project Stack Parameters for Fuel Oil Operation						
Stack No.	Easting (m)	Northing (m)	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temp (K)
Simple Cycle Unit 1	408,835	3,354,491	27.4	5.49	46.27	848.71
Combined Cycle Unit 2	408,774	3,354,531	57.9	5.49	21.28	402.6
Combined Cycle Unit 3	408,713	3,354,531	57.9	5.49	21.28	402.6

Table 1-6
Project Stack Parameters for Natural Gas Operation

Stack No.	Easting (m)	Northing (m)	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temp (K)
Simple Cycle Unit 1	408,835	3,354,491	27.4	5.49	45.04	875.37
Combined Cycle Unit 2	408,774	3,354,531	57.9	5.49	18.71	368.71
Combined Cycle Unit 3	408,713	3,354,531	57.9	5.49	18.71	368.71

Table 1-7
SO_2 Emission Rates (g/s) used in the Modeling Analyses

Stack No.	3-hour[a,b]	24-hour ISC	24-hour CALPUFF[d]	24-hour CALPUFF[e]	24-hour CALPUFF[f]	24-hour CALPUFF[g]	Annual[a,c]
Simple Cycle Unit 1	12.37	8.29	6.64	8.29	0.14	8.29	1.12
Combined Cycle Unit 2	13.78	13.78	11.02	13.78	13.78	10.37	0.6
Combined Cycle Unit 3	13.78	13.78	11.02	0.15	13.78	10.37	0.6

[a]These emission rates were used in both the ISC and CALPUFF Class I modeling.

[b]For short-term emission rates involving any fuel oil firing for more than half a day (i.e., 12 hours), the fuel oil operating parameters were used. Otherwise the natural gas operating parameters were used.

[c]For annual emission rates, natural gas stack parameters were used.

[d]Emission rates were derived assuming 0.04% Sulfur fuel oil (rather than 0.05%).

[e]Emission rates were derived by assuming the SCCT operating 16 hrs/day on fuel oil, one CCCT operating on fuel oil, and one CCCT operating on natural gas.

[f]Emission rates were derived by assuming the SCCT operating on natural gas and the two CCCTs operating on fuel oil.

[g]Emission rates were derived by assuming the SCCT operating 16 hrs/day on fuel oil and the two CCCTs operating 18 hrs/day on fuel oil.

1.5 Class I Impact Results

The following section presents the results of the SO_2 cumulative modeling analyses. An electronic copy of the ISCST3 and CALPUFF modeling input and output files are provided in Attachment C.

1.5.1 Step 1 Modeling Analysis

Ground-level impacts (in µg/m3) of the project onto to the ONWR and WINWR were modeled for SO_2 (3-hour, 24-hour and annual averaging periods). The ISCST3 air dispersion model was used for that portion of the ONWR that lies with 50 km of the proposed site. The CALPUFF air modeling system was used for those portions of ONWR and WINWR that lie beyond 50 km. The results of this analysis, presented in Table 1-8, are compared with the applicable Class I Significant Impact Levels (SILs) calculated as 4 percent of the PSD Class I Increment values. As presented in the table, model predicted air quality impacts exceed the applicable modeling significance levels for the 3-hour and 24-hour averaging periods. Therefore, additional modeling analyses were performed as presented in the following section. For the annual averaging period, no additional modeling is required as the model predicted impacts are below the applicable thresholds.

1.5.2 Step 2 Modeling Analysis

For those modeling scenarios where the project impacts exceeded the PSD Class I SILs, a cumulative source inventory was developed to compare the impacts of the project in combination with other nearby PSD increment consuming sources. The modeled impacts were compared to the applicable PSD Class I Increment values. The modeled impacts are presented in Table 1-9. As allowed by the PSD regulations, the highest second highest modeled impacts for the short-term averaging periods were used for comparison to the PSD Class I Increments. As presented in the table, the cumulative modeling impacts exceed the applicable PSD Class I Increment values for the 3-hour and 24-hour averaging periods for SO_2. Therefore, a culpability analysis (a determination of the project impacts at the particular receptor locations for the applicable time periods) was performed as described in the following section.

1.5.3 Step 3 Modeling Analysis

For the Step 3 modeling analyses, each receptor and corresponding time periods were identified for each high second high modeled impact greater than the PSD Class I Increments. Modeling was performed at each of the receptors for the time period of the modeled exceedance to determine the contribution of the project at the modeled exceedance. If the project's modeled contribution to the exceedances, the maximum of which was reported in the Step 2 analyses, are below the Class I SILs, then no further analysis is warranted. The modeling results are presented in Table 1-10.

As presented in Table 1-10, the project's maximum contribution at each of the receptors and corresponding time periods for which a PSD Class I SO2 increment violation was modeled does not exceed the applicable PSD Class I SILs. Since the project does not significantly contribute to any exceedance of the PSD Class I SO2 increments, no further analyses are warranted.

1.6 Conclusions

Based on the modeling presented in earlier sections, the following operating scenarios demonstrate that the operation of the project will not exceed the applicable regulatory thresholds:

- All turbines (two combined cycle turbines and one simple cycle turbine) operating on 0.04 percent sulfur fuel oil. (The simple cycle turbine is permitted to operate no more than 16 hours per day on fuel oil with the remainder on natural gas) – No daily hourly limitation on the operation of the combined cycle turbines.
- Any two turbines operating on 0.05 percent fuel oil. (The simple cycle turbine is permitted to operate no more than 16 hours per day on fuel oil with the remainder on natural gas) – No daily hourly limitation on the operation of the combined cycle turbines.
- The two combined cycle turbines operating 18 hours per day and the simple cycle turbine operating 16 hours per day on fuel oil with 0.05 percent sulfur.

Table 1-8
Class I Area SO_2 Modeling Results
Project Impacts

Class I Area	Pollutant	Averaging Period	Project Maximum Impact (μg/m^3)	SIL (μg/m^3)	Exceed SIL
ISCST3 Modeling[a]					
Okefenokee	SO_2	3-hr	3.01	1	YES
		24-hr	0.60	0.2	YES
		Annual	0.0027	~~0.04~~ 0.1	NO
CALPUFF Modeling[g] - Permit Application Scenario[b]					
Okefenokee	SO_2	3-hr	1.7701	1	YES
Okefenokee	SO_2	24-hr	0.5349	0.2	YES
Okefenokee	SO_2	Annual	0.0014296	0.04	NO
Wolf Island[g]	SO_2	3-hr	0.57011	1	NO
Wolf Island[g]	SO_2	24-hr	0.16093	0.2	NO
Wolf Island[g]	SO_2	Annual	0.0079636	0.04	NO
CALPUFF Modeling[g] – Scenario 1[c]					
Okefenokee	SO_2	24-hr	0.42987	0.2	YES
CALPUFF Modeling[g] – Scenario 2[d]					
Okefenokee	SO_2	24-hr	0.30749	0.2	YES
CALPUFF Modeling[g] – Scenario 3[e]					
Okefenokee	SO_2	24-hr	0.46190	0.2	YES
CALPUFF Modeling[g] – Scenario 4[f]					
Okefenokee	SO_2	24-hr	0.42095	0.2	YES

Notes

[a]Performed for those portions of the Class I area that lie within 50 km from the project location.

[b]Modeling based on 0.05 percent sulfur fuel oil and combined cycle turbines operating 8,760 hours per year and simple cycle turbine operating within permit limitations.

[c]Impacts were modeled assuming 0.04 percent sulfur fuel oil (rather than 0.05 percent).

[d]Impacts were modeled by assuming the SCCT operating 16 hrs/day on fuel oil, one CCCT operating on fuel oil, and one CCCT operating on natural gas.

[e]Impacts were modeled by assuming the SCCT operating on natural gas and the two CCCTs operating on fuel oil.

[f]Impacts were modeled by assuming the SCCT operating 16 hrs/day on fuel oil and the two CCCTs operating 18 hrs/day on fuel oil.

[g]The highest short-term emission rates for the project (i.e., maximum oil firing emission rates) were used for all averaging periods.

[g]Performed for those portions of the Class I area that lie beyond 50 km from the project location.

Table 1-9 Class I Area SO_2 Modeling Results Cumulative Inventory Including Project					
Class I Area	Pollutant	Averaging Period	High 2nd High Cumulative Impact[a] ($\mu g/m^3$)	Class I Increment ($\mu g/m^3$)	Exceed Class I Increment
ISCST3 Modeling					
Okefenokee	SO_2	3-hr	32.81[b]	25	YES
		24-hr	8.46[b]	5	YES
CALPUFF Modeling-Permit Application Scenario[b]					
Okefenokee	SO_2	3-hr	25.736	25	YES
Okefenokee	SO_2	24-hr	5.5818	5	YES
CALPUFF Modeling – Scenario 1[c]					
Okefenokee	SO_2	24-hr[b]	5.5813	5	YES
CALPUFF Modeling – Scenario 2[d]					
Okefenokee	SO_2	24-hr[c]	5.5810	5	YES
CALPUFF Modeling – Scenario 3[e]					
Okefenokee	SO_2	24-hr[d]	5.5808	5	YES
CALPUFF Modeling – Scenario 4[f]					
Okefenokee	SO_2	24-hr[e]	5.5814	5	YES

Notes:

[a]Highest 2nd High modeled impacts were used for comparison to the Class I Increment values which allow one exceedance per year.

[b]Modeling based on 0.05 percent sulfur fuel oil and combined cycle turbines operating 8,760 hours per year and simple cycle turbine operating within permit limitations.

[c]Impacts were modeled assuming 0.04 percent sulfur fuel oil (rather than 0.05 percent).

[d]Impacts were modeled by assuming the SCCT operating 16 hrs/day on fuel oil, one CCCT operating on fuel oil, and one CCCT operating on natural gas.

[e]Impacts were modeled by assuming the SCCT operating on natural gas and the two CCCTs operating on fuel oil.

[f]Impacts were modeled by assuming the SCCT operating 16 hrs/day on fuel oil and the two CCCTs operating 18 hrs/day on fuel oil.

Table 1-10
Class I Area SO_2 Modeling Results
Culpability Analyses – Project's Contribution to Increment Exceedances

Class I Area	Pollutant	Averaging Period	Project's Maximum Contribution at Exccedance[a] (µg/m³)	Class I SIL (µg/m³)	Project Impacts Exceed Class I SIL
ISCST3 Modeling					
Okefenokee	SO_2	3-hr	0.57	1	NO
		24-hr	0.17	0.2	NO
CALPUFF Modeling-Permit Application Scenario[b]					
Okefenokee	SO_2	3-hr	0.64791	1	NO
Okefenokee	SO_2	24-hr	0.22740	0.2	YES
CALPUFF Modeling – Scenario 1[c]					
Okefenokee	SO_2	24-hr	0.18886	0.2	NO
CALPUFF Modeling – Scenario 2[d]					
Okefenokee	SO_2	24-hr	0.13731	0.2	NO
CALPUFF Modeling – Scenario 3[e]					
Okefenokee	SO_2	24-hr	0.19971	0.2	NO
CALPUFF Modeling – Scenario 4[f]					
Okefenokee	SO_2	24-hr	0.18594	0.2	NO

Notes:
[a]Reported values are project's maximum model predicted contribution to all of the modeled exceedances of the Class I increment.
[b] Modeling based on 0.05 percent sulfur fuel oil and combined cycle turbines operating 8,760 hours per year and simple cycle turbine operating within permit limitations.
[c]Impacts were modeled assuming 0.04 percent sulfur fuel oil (rather than 0.05 percent). SC 16 hrs
[d]Impacts were modeled by assuming the SCCT operating 16 hrs/day on fuel oil, one CCCT operating on fuel oil, and one CCCT operating on natural gas.
[e]Impacts were modeled by assuming the SCCT operating on natural gas and the two CCCTs operating on fuel oil.
[f]Impacts were modeled by assuming the SCCT operating 16 hrs/day on fuel oil and the two CCCTs operating 18 hrs/day on fuel oil.

Let Ellen Porter know what our specific conditions are.

Attachment A
Copy of EPA Comment Letter

Best Available Copy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUL 1 . 2001

RECEIVED
JUL 24 2001
BUREAU OF AIR REGULATION

4 APT-ARB

Mr. A. A. Linero, P.E.
FL Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Linero:

Thank you for sending the preliminary determination and draft prevention of significant deterioration (PSD) permit for the JEA Brandy Branch facility dated April 26, 2001. The draft PSD permit is for the proposed conversion of two simple cycle combustion turbines (CTs) to combined cycle CTs. This project includes the addition of two heat recovery steam generating (HRSG) units with natural gas fired duct burners, a steam turbine generator and a fresh water cooling tower. This project will add 200 megawatts (MW) of electric generating capacity to the 510 MW capacity of the already permitted JEA Brandy Branch facility. The HRSG duct burners will combust pipeline quality natural gas only, and the combined cycle CTs will primarily combust natural gas with No. 2 fuel oil combusted as backup fuel. As proposed, the combined cycle CTs will be allowed to fire natural gas up to 8,760 hours per year and fire No. 2 fuel oil a maximum of 288 hours per year. Total emissions from the proposed project are above the thresholds requiring PSD review for nitrogen oxides (NO_x), carbon monoxide (CO), and particulate matter (PM/PM_{10}).

The PSD permit to construct the original three simple cycle CTs is dated September 14, 1999. It is our understanding that none of the CTs have begun operating. Therefore, we do not view the proposed conversion as a modification of an existing major source but rather as a change in the design of the entire facility. Accordingly, emissions from the CT that will remain in simple cycle service should be included with emissions from the two converted CTs to assess PSD applicability

Based on our review of the PSD permit application, preliminary determination and draft PSD permit, we have the following comments regarding the BACT analysis and PSD applicability. A comment regarding the air quality impact assessment is provided at the end of this letter.

1. Condition 22 of the draft PSD permit limits emissions of volatile organic compounds (VOC) to 4.8 lb/hour and 8.2 lb/hour when firing natural gas and No. 2 fuel oil, respectively. Table 2-1 (maximum hourly emission rates) of the PSD permit application states the maximum hourly VOC emission rates are 3.49 lb/hour and 7.68 lb/hour when firing natural gas and No. 2 fuel oil, respectively. In order to avoid PSD review for VOC,

the final PSD permit should limit the hourly VOC emission rates to those listed in Table 2-1.

2. Table 2-2 (PSD applicability) of the PSD permit application indicates the potential to emit of sulfur dioxide (SO_2) is based on 0.2 gr/100 scf of sulfur in natural gas and 0.05 percent sulfur by weight in fuel oil. Condition 23 of the draft PSD permit limits the sulfur content of natural gas to 2 gr/100 scf. In order to avoid PSD review for SO_2, the final PSD permit should limit the sulfur content of natural gas to 0.2 gr/100 scf or some other level that ensures emissions of SO_2 do not exceed the PSD significant emissions threshold of 40 tons per year.

3. We are pleased to see that Florida Department of Environmental Protection (FDEP) re-performed the cost analyses for the SCONOx™ and catalytic oxidation add-on control systems. We also questioned a number of items in the applicant's cost evaluation.

In terms of the air quality impact assessment, we have only one comment (below) which has been discussed with FDEP on June 25, 2001.

Project Definition - As discussed above, our view is that the current PSD permit application is not for the modification of an existing major source but an addendum to the PSD permit application. Therefore, the applicable PSD pollutants and air quality impact assessments should include emissions associated with the operation of the two converted combined cycle CTs and the previously permitted simple cycle CT.

Thank you for the opportunity to comment on the JEA Brandy Branch facility preliminary determination and draft permit. If you have any questions regarding these comments, please direct them to either Ms. Katy Forney at 404-562-9130 or Mr. Stan Krivo at 404-562-9123.

Sincerely,

R. Douglas Neeley
Chief
Air and Radiation Technology Branch
Air, Pesticides and Toxics
Management Division

Attachment B
List of PSD Increment Sources Provided by FDEP

JEA Brandy Branch
Final Class 1 Cumulative Modeling Inventory

	Source ID	Desciption	UTM Easting (m)	UTM Northing (m)	Elev (m)	Emission Rate (g/s)	Stack Ht (m)	Exit Temp (K)	Exit Vel (m/s)	Stack Diam (M)
1	SFP	Fire Pump	408894	3354536	0	0.0042	7.3152	615.93	60.02	0.15
2	CJEAN1	JEA Northside Repowered Unit 1	446670	3365070	0	69.71	151	330.9	19.2	4.57
3	CJEAN2	JEA Northside Repowered Unit 2	446670	3365070	0	69.71	151	330.9	19.2	4.57
4	CJEAN3	JEA Northside New Limestone Dryers	446740	3365240	0	0.035	22.9	347	15.24	1.04
5	CRIVER1	St. John's River Power Project Unit 1	447080	3366660	0	929.79	195.1	342	27.4	6.79
6	CRIVER2	St. John's River Power Project Unit 2	447100	3366660	0	929.79	195.1	342	27.4	6.79
7	CBUSCH1	Anheuser Bush Jacksonville Biogas Flare	440580	3366790	0	1.07	6.1	811	126.1	0.6
8	CBUSCH2	Anheuser Bush Jacksonville Backup Biogas Flare	440580	3366790	0	1.07	6.1	811	126.1	0.6
9	CCBAY1	Ceder Bay Cogen Circ fluidized Bed Boiler 1-A	441610	3365540	0	32.17	122.9	327	36.6	4.1
10	CCBAY2	Ceder Bay Cogen Circ fluidized Bed Boiler 1-B	441610	3365540	0	32.17	122.9	327	36.6	4.1
11	CCBAY3	Ceder Bay Cogen Circ fluidized Bed Boiler 1-C	441610	3365540	0	32.17	122.9	327	36.6	4.1
12	CCBAY4	Ceder Bay Cogen Limestone Dryer	441610	3365540	0	0.03	19.2	301	28.4	1.3
13	CCBAY5	Ceder Bay Cogen Limestone Dryer	441610	3365540	0	0.03	19.2	301	28.4	1.3
14	CPAPER1	GA Gilman Paper -Power Boiler 3	448200	3401300	0	87.36	83.8	450	2.8	4.3
15	CPAPER2	GA Gilman Paper -Coal Fired Boiler	448200	3401300	0	88.82	45.7	326	7.8	3.1
16	CPAPER3	GA Gilman Paper -Recovery Boiler 2,3	448200	3401300	0	15.2	54.9	425	16.8	2.1
17	CPAPER4	GA Gilman Paper Recovery Boiler 4	448200	3401300	0	15.81	76.2	411	12.2	2.6
18	CPAPER5	GA Gilman Paper -Lime Kiln	448200	3401300	0	2.13	30.5	350	11.6	1.5
19	CMILL1	Jefferson S-fit Corp - Black Liquor Recovery Boiler 9	439900	3359300	0	36.78	53.4	410	22.9	3.2
20	CMILL2	Jefferson S-fit Corp - No 10 Bark/Coal Boiler	439900	3359300	0	25.65	61	335	10.7	3
21	CMILL3	Jefferson S-fit Corp - #3 Lime Kiln	439900	3359300	0	1.31	64	346	11	1.4
22	CBMILL1	Jefferson S-fit Corp - #5 Pwr Blr	456200	3394200	0	190.57	78.4	454	15.2	3.4
23	CBMILL2	Jefferson S-fit Corp -#4 Recy Blr	456200	3394200	0	40.46	80.8	493	18.6	3.5
24	CBMILL3	Jefferson S-fit Corp - #5 RB-S or C Rec/Boiler	456200	3394200	0	45.12	88.1	484	18.9	3.9
25	CBMILL4	Jefferson S-fit Corp - #7 Pwr Blr	456200	3394200	0	154.51	103.7	441	12.8	4.5
26	CBMILL5	Jefferson S-fit Corp - #4 Lime Kiln	456200	3394200	0	3.37	22.9	436	16.8	1.7
27	CMCHEM	Milleninum Specialty Chemicals- #7 Fossil Fuel Steam Gen	436790	3360740	0	4.01	13.7	450	5.5	1.2
28	CRAY1	Rayonier Inc.- #1 Pwr Boiler	454700	3392200	0	53.21	54.9	336	9.8	3
29	CRAY2	Rayonier Inc.- #2 Pwr Boiler	454700	3392200	0	50.56	54.9	336	9.8	3

30	CRAY3	Rayonier Inc.- #3 Pwr Boiler	454700	3392200	0	55.51	54.9	329	9.8	3
31	CS1	Stone Container Corporation- Boiler 1	442950	3365390	0	0.72	61	439	5.2	2.4
32	CS2	Stone Container Corporation- Boiler 2	442950	3365390	0	0.72	61	439	5.2	2.4
33	CS3	Stone Container Corporation- Boiler 3	442950	3365390	0	0.72	61	439	5.2	2.4
34	EMCHEM	Milleninum Specialty Chemicals- Boiler 3 retired	436790	3360740	0	-8.49	12.2	658	10.1	1.1
35	ERAY	Rayonier Inc.- #1 Pwr Boiler	454700	3392200	0	-39.82	54.9	329	9.8	3
36	ES1	Stone Container Corporationm- Bark Boiler 1	442950	3365390	0	-57.85	41.45	332	13.01	2.46
37	ES2	Stone Container Corporationm- Bark Boiler 2	442950	3365390	0	-57.85	41.45	332	13.01	2.46
38	ES3	Stone Container Corporationm- Pwr Boiler 1	442950	3365390	0	-42.1	32.31	455	14.02	1.83
39	ES4	Stone Container Corporationm- Pwr Boiler 2	442950	3365390	0	-61.59	32.31	439	14.51	2.13
40	ES5	Stone Container Corporationm- Pwr Boiler 3	442950	3365390	0	-61.21	32.31	439	14.51	2.13
41	ES6	Stone Container Corporationm- Recovery Boiler 1	442950	3365390	0	-12.93	38.4	341	15.97	2.59
42	ES7	Stone Container Corporationm- Recovery Boiler 2	442950	3365390	0	-16.53	38.4	345	15.61	2.74
43	ES8	Stone Container Corporationm- Recovery Boiler 3	442950	3365390	0	-16.53	38.4	344	14.6	2.74
44	ES9	Stone Container Corporationm- Smelt Dissolvign Tank 1	442950	3365390	0	-0.37	36.58	344	3.96	1.07
45	ES10	Stone Container Corporationm- Smelt Dissolvign Tank 2	442950	3365390	0	-0.47	37.8	344	4.27	1.22
46	ES11	Stone Container Corporationm- Smelt Dissolvign Tank 3	442950	3365390	0	-0.47	37.8	344	4.27	1.22
47	ES12	Stone Container Corporationm- Lime Kiln 1	442950	3365390	0	-0.82	21.03	343	3.11	1.77
48	ES13	Stone Container Corporationm- Lime Kiln 2	442950	3365390	0	-0.82	22.86	336	6.52	1.42
49	ES14	Stone Container Corporationm- Lime Kiln 3	442950	3365390	0	-0.82	22.86	336	8.17	1.12
50	ES15	Stone Container Corporationm- Bark Boiler 1	442950	3365390	0	-7.85	41.45	332	13.01	2.46
51	ES16	Stone Container Corporationm- Bark Boiler 2	442950	3365390	0	-9.35	41.45	332	13.01	2.46
52	ES17	Stone Container Corporationm- Pwr Boiler 1	442950	3365390	0	-40.71	32.31	455	14.02	1.83
53	ES18	Stone Container Corporationm- Pwr Boiler 2	442950	3365390	0	-59.57	32.31	439	14.51	2.13
54	ES19	Stone Container Corporationm- Pwr Boiler 3	442950	3365390	0	-59.37	32.31	439	14.51	2.13
55	ES21	Stone Container Corporationm- Recovery Boiler 1	442950	3365390	0	-15.71	38.4	345	15.61	2.74
56	ES20	Stone Container Corporationm- Recovery Boiler 2	442950	3365390	0	-12.25	38.4	341	15.97	2.59
57	ES22	Stone Container Corporationm- Recovery Boiler 3	442950	3365390	0	-15.94	38.4	344	14.6	2.74
58	ES23	Stone Container Corporationm- Smelt Dissolvign Tank 1	442950	3365390	0	-0.35	36.58	344	3.96	1.07
59	ES24	Stone Container Corporationm- Smelt Dissolvign Tank 2	442950	3365390	0	-0.45	37.8	344	4.27	1.22
60	ES25	Stone Container Corporationm- Smelt Dissolvign Tank 3	442950	3365390	0	-0.45	37.8	344	4.27	1.22
61	ES26	Stone Container Corporationm- Lime Kiln 1	442950	3365390	0	-0.56	21.03	343	3.11	1.77
62	ES27	Stone Container Corporationm- Lime Kiln 2	442950	3365390	0	-0.67	22.86	336	6.52	1.42
63	ES28	Stone Container Corporationm- Lime Kiln 3	442950	3365390	0	-0.66	22.86	336	8.17	1.12
64	EJEAN1	JEA Northside Existing Unit 1	446970	3365230	0	-690.92	76.2	403	23.1	4.87

65	EJEAN2	JEA Northside Existing Unit 2	446910	3365220	0	-584.55	88.4	394	13.1	5
66	EPAPER1	GA Gilman Paper Company - Pwr Blr 1-3	448200	3401300	0	-281.25	83.8	450	7.3	4.3
67	EPAPER2	GA Gilman Paper Company - Pwr Blr 4	448200	3401300	0	-59.95	36.6	700	20	1.8
68	EPAPER3	GA Gilman Paper Company - Recopvery Boiler 2	448200	3401300	0	-7.6	47.2	426	13.1	2.3
69	EPAPER4	GA Gilman Paper Company - Recopvery Boiler 3	448200	3401300	0	-7.6	53.3	394	25.2	1.6
70	EPAPER5	GA Gilman Paper Company - Recopvery Boiler 4	448200	3401300	0	-15.81	76.2	427	22.1	2.6
71	EKEN	JEA Kennedy - #8 Steam Generator	440000	3359200	0	-75.05	45.7	394	10.4	3.2
72	EMILL1	Jefferson Smurfit Corp- Black Liquor Recovery Boiler 9	439900	3359300	0	-16.81	53.4	410	22.9	3.2
73	EMILL2	Jefferson Smurfit Corp- Lime Kiln 1-2	439900	3359300	0	-0.98	15.8	347	6.7	1.5
74	EMILL3	Jefferson Smurfit Corp-Power Boilers	439900	3359300	0	-36.51	76.2	455	8	3.8
75	EBMILL1	Jefferson Smurfit Corp-Power Boilers 3 and 4	456200	3394200	0	-144.83	69.2	483	16.9	2.4
76	EBMILL2	Jefferson Smurfit Corp- #5 pwr Boiler	456200	3394200	0	-170.16	69.2	480	16.3	3.4
77	EBMILL3	Jefferson Smurfit Corp- #4 Recovery Boiler	456200	3394200	0	-35.13	75.9	493	18.8	3.5
78	EBMILL4	Jefferson Smurfit Corp- Recovery Boiler #3	456200	3394200	0	-10.51	40.8	390	13.3	2.7
79	EBMILL5	Jefferson Smurfit Corp- Lime Kiln 2	456200	3394200	0	-1.3	13.4	361	12.3	1.1
80	EBMILL6	Jefferson Smurfit Corp- Lime Kiln 3	456200	3394200	0	-1.3	13.4	360	17.6	1.4
81	EBMILL7	Jefferson Smurfit Corp- Smelt Dissolving Tank 4	456200	3394200	0	-0.2	69.5	350	5.2	1.8
82	EBMILL8	Jefferson Smurfit Corp- Smelt Dissolving Tank 3	456200	3394200	0	-0.69	33.2	360	5.8	0.6
83	CTRS	Georgia Pacific -Palatka- TRS Incinerator	434000	3283400	0	75.6	76.2	533.2	32.03	0.94
84	ECB4	Georgia Pacific -Palatka- Combustion Boiler No 4	434000	3283400	0	-121.28	72.9	477	10.52	3.05
85	EPB5	Georgia Pacific -Palatka- Power Boiler No 5	434000	3283400	0	-161.15	72.9	520	15.97	2.74
86	EPB4	Georgia Pacific -Palatka- Power Boiler No 4	434000	3283400	0	-45.22	37.2	477	14.54	1.22
87	ELK4	Georgia Pacific -Palatka- Lime Kiln 4	434000	3283400	0	-1.4	45.4	351	16.46	1.31
88	ELK3	Georgia Pacific -Palatka- Lime Kiln 3	434000	3283400	0	-0.48	15.9	342	8.47	1.71
89	ELK2	Georgia Pacific -Palatka- Lime Kiln 2	434000	3283400	0	-0.24	15.9	341	10.67	1.71
90	ELK1	Georgia Pacific -Palatka- Lime Kiln 1	434000	3283400	0	-0.24	15.2	401	5.24	1.28
91	ESDT4	Georgia Pacific -Palatka- Smelt Dissolving Tank 4	434000	3283400	0	-0.71	62.8	346	8.26	1.52
92	ESDT3	Georgia Pacific -Palatka- Smelt Dissolving Tank 3	434000	3283400	0	-0.18	33.2	369	3.57	0.76
93	ESDT2	Georgia Pacific -Palatka- Smelt Dissolving Tank 2	434000	3283400	0	-0.18	30.5	375	9.51	0.91
94	ESDT1	Georgia Pacific -Palatka- Smelt Dissolving Tank 1	434000	3283400	0	-0.13	30.5	366	7.53	0.76
95	ERB4	Georgia Pacific -Palatka- Recovery Boiler 4	434000	3283400	0	-34.97	70.1	474	16.86	3.66
96	ERB3	Georgia Pacific -Palatka- Recovery Boiler 3	434000	3283400	0	-8.58	40.5	372	7.28	3.41
97	ERB2	Georgia Pacific -Palatka- Recovery Boiler 2	434000	3283400	0	-8.88	76.2	372	8.8	3.66
98	ERB1	Georgia Pacific -Palatka- Recovery Boiler 1	434000	3283400	0	-6.21	76.2	360	8.8	3.66
99	EFPLPALA	Florida Power and Light- Palatka Unit 2	442800	3277600	0	-257.03	45.7	408.1	9.5	3.96

100	CFPLPUTM	Florida Power and Light- Putnam	443300	3277600	0	175.85	22.3	437.4	58.6	3.15
101	CSEMELEC	Seminole Power Plant Units 1 and 2	438800	3289200	0	2168.8	205.7	326.5	7.99	10.97
102	CCB4	Georgia Pacific -Palatka- Combustion Boiler No 4	434000	3283400	0	145.03	72.2	499.8	21.88	2.44
103	CPB6	Georgia Pacific -Palatka- Power Boiler No 6	434000	3283400	0	1.4	18.3	622	17.43	1.83
104	CPB5	Georgia Pacific -Palatka- Power Boiler No 5	434000	3283400	0	197.13	70.7	502.6	18.47	2.74
105	CPB4	Georgia Pacific -Palatka- Power Boiler No 4	434000	3283400	0	45.23	61	474.8	21.82	1.22
106	CLK4	Georgia Pacific -Palatka- Lime Kiln 4	434000	3283400	0	1.37	39.9	338.7	18.53	1.35
107	CSDT4	Georgia Pacific -Palatka- Smelt Dissolving Tank 4	434000	3283400	0	1	62.8	344.3	6.46	1.52
108	CRB4	Georgia Pacific -Palatka- Recovery Boiler 4	434000	3283400	0	13.85	70.1	477.6	19.42	3.66
109	S1FO_3	JEA BB CT Exhaust Stack #1-Simple Cycle	408835	3354491	0	12.37	27.432	848.71	46.27	5.4864
110	S2FO1	JEA BB CT Exhaust Stack #2-Combined Cycle	408774.1	3354531	0	13.78	57.912	402.59	21.2836	5.4864
111	S3FO1	JEA BB CT Exhaust Stack #3-Combined Cycle	408713.1	3354531	0	13.78	57.912	402.59	21.2836	5.4864
112	JEASS1	JEA Southside Unit 1	437670	3353890	0	-52.7	40.7	446	15.5	2.44
113	JEASS2	JEA Southside Unit 2	437670	3353910	0	-52.7	40.7	446	15.5	2.44
114	JEASS3	JEA Southside Unit 3	437678	3353933	0	-79.8	40.7	424	13.4	3.05
115	JEASS4	Jea southside Boiler NO4	437670	3353962	0	-110.32	43.7	408	18.5	3.25
116	JEASS5A	JEA southside Boiler No 5	437682	3353849	0	-103.95	44.2	415	21.3	2.96
117	JEASS5B	JEA Southside Boiler No5 stack 2	437682	3353841	0	-103.95	44.2	415	21.3	2.96
118	KNDY9	JEA Kennedy Unit 9	440070	3359130	0	-75	45.7	416	12.2	3.2
119	KNDY10A	JEA Kennedy 10 A	440085	3359090	0	-92.5	41.5	427	24.3	2.74
120	KNDY10B	JEA Kennedy 10 B	440085	3359100	0	-92.5	41.5	427	24.3	2.74

JEA Brandy Branch Class 1 Cumulative Modeling
Increment Expanding Sources For SO_2 PSD Modeling

	Source ID	Desciption	UTM Easting (m)	UTM Northing (m)	Elev (m)	Emission Rate (g/s)	Stack Ht (m)	Exit Temp (K)	Exit Vel (m/s)	Stack Diam (M)
1	EFPLPALA	Florida Power and Light- Palatka Unit 2	442800	3277600	0	-257.03	45.7	408.1	9.5	3.96
2	EPAPER1	GA Gilman Paper Company - Pwr Blr 1-3	448200	3401300	0	-281.25	83.8	450	7.3	4.3
3	EPAPER2	GA Gilman Paper Company - Pwr Blr 4	448200	3401300	0	-59.95	36.6	700	20	1.8
4	EPAPER3	GA Gilman Paper Company - Recopvery Boiler 2	448200	3401300	0	-7.6	47.2	426	13.1	2.3
5	EPAPER4	GA Gilman Paper Company - Recopvery Boiler 3	448200	3401300	0	-7.6	53.3	394	25.2	1.6
6	EPAPER5	GA Gilman Paper Company - Recopvery Boiler 4	448200	3401300	0	-15.81	76.2	427	22.1	2.6
7	ECB4	Georgia Pacific -Palatka- Combustion Boiler No 4	434000	3283400	0	-121.28	72.9	477	10.52	3.05
8	ELK1	Georgia Pacific -Palatka- Lime Kiln 1	434000	3283400	0	-0.24	15.2	401	5.24	1.28
9	ELK2	Georgia Pacific -Palatka- Lime Kiln 2	434000	3283400	0	-0.24	15.9	341	10.67	1.71
10	ELK3	Georgia Pacific -Palatka- Lime Kiln 3	434000	3283400	0	-0.48	15.9	342	8.47	1.71
11	ELK4	Georgia Pacific -Palatka- Lime Kiln 4	434000	3283400	0	-1.4	45.4	351	16.46	1.31
12	EPB4	Georgia Pacific -Palatka- Power Boiler No 4	434000	3283400	0	-45.22	37.2	477	14.54	1.22
13	EPB5	Georgia Pacific -Palatka- Power Boiler No 5	434000	3283400	0	-161.15	72.9	520	15.97	2.74
14	ERB1	Georgia Pacific -Palatka- Recovery Boiler 1	434000	3283400	0	-6.21	76.2	360	8.8	3.66
15	ERB2	Georgia Pacific -Palatka- Recovery Boiler 2	434000	3283400	0	-8.88	76.2	372	8.8	3.66
16	ERB3	Georgia Pacific -Palatka- Recovery Boiler 3	434000	3283400	0	-8.58	40.5	372	7.28	3.41
17	ERB4	Georgia Pacific -Palatka- Recovery Boiler 4	434000	3283400	0	-34.97	70.1	474	16.86	3.66
18	ESDT1	Georgia Pacific -Palatka- Smelt Dissolving Tank 1	434000	3283400	0	-0.13	30.5	366	7.53	0.76
19	ESDT2	Georgia Pacific -Palatka- Smelt Dissolving Tank 2	434000	3283400	0	-0.18	30.5	375	9.51	0.91
20	ESDT3	Georgia Pacific -Palatka- Smelt Dissolving Tank 3	434000	3283400	0	-0.18	33.2	369	3.57	0.76
21	ESDT4	Georgia Pacific -Palatka- Smelt Dissolving Tank 4	434000	3283400	0	-0.71	62.8	346	8.26	1.52
22	EKEN	JEA Kennedy - #8 Steam Generator	440000	3359200	0	-75.05	45.7	394	10.4	3.2
23	KNDY10A	JEA Kennedy 10 A	440085	3359090	0	-92.5	41.5	427	24.3	2.74
24	KNDY10B	JEA Kennedy 10 B	440085	3359100	0	-92.5	41.5	427	24.3	2.74
25	KNDY9	JEA Kennedy Unit 9	440070	3359130	0	-75	45.7	416	12.2	3.2
26	EJEAN1	JEA Northside Existing Unit 1	446970	3365230	0	-690.92	76.2	403	23.1	4.87
27	EJEAN2	JEA Northside Existing Unit 2	446910	3365220	0	-584.55	88.4	394	13.1	5
28	JEASS5A	JEA southside Boiler No 5	437682	3353849	0	-103.95	44.2	415	21.3	2.96
29	JEASS4	Jea southside Boiler NO4	437670	3353962	0	-110.32	43.7	408	18.5	3.25

30	JEASS5B	JEA Southside Boiler No5 stack 2	437682	3353841	0	-103.95	44.2	415	21.3	2.96
31	JEASS1	JEA Southside Unit 1	437670	3353890	0	-52.7	40.7	446	15.5	2.44
32	JEASS2	JEA Southside Unit 2	437670	3353910	0	-52.7	40.7	446	15.5	2.44
33	JEASS3	JEA Southside Unit 3	437678	3353933	0	-79.8	40.7	424	13.4	3.05
34	EBMILL3	Jefferson Smurfit Corp- #4 Recovery Boiler	456200	3394200	0	-35.13	75.9	493	18.8	3.5
35	EBMILL2	Jefferson Smurfit Corp- #5 pwr Boiler	456200	3394200	0	-170.16	69.2	480	16.3	3.4
36	EMILL1	Jefferson Smurfit Corp- Black Liquor Recovery Boiler 9	439900	3359300	0	-16.81	53.4	410	22.9	3.2
37	EMILL2	Jefferson Smurfit Corp- Lime Kiln 1-2	439900	3359300	0	-0.98	15.8	347	6.7	1.5
38	EBMILL5	Jefferson Smurfit Corp- Lime Kiln 2	456200	3394200	0	-1.3	13.4	361	12.3	1.1
39	EBMILL6	Jefferson Smurfit Corp- Lime Kiln 3	456200	3394200	0	-1.3	13.4	360	17.6	1.4
40	EBMILL4	Jefferson Smurfit Corp- Recovery Boiler #3	456200	3394200	0	-10.51	40.8	390	13.3	2.7
41	EBMILL8	Jefferson Smurfit Corp- Smelt Dissolving Tank 3	456200	3394200	0	-0.69	33.2	360	5.8	0.6
42	EBMILL7	Jefferson Smurfit Corp- Smelt Dissolving Tank 4	456200	3394200	0	-0.2	69.5	350	5.2	1.8
43	EMILL3	Jefferson Smurfit Corp-Power Boilers	439900	3359300	0	-36.51	76.2	455	8	3.8
44	EBMILL1	Jefferson Smurfit Corp-Power Boilers 3 and 4	456200	3394200	0	-144.83	69.2	483	16.9	2.4
45	EMCHEM	Milleninum Specialty Chemicals- Boiler 3 retired	436790	3360740	0	-8.49	12.2	658	10.1	1.1
46	ERAY	Rayonier Inc.- #1 Pwr Boiler	454700	3392200	0	-39.82	54.9	329	9.8	3
47	ES1	Stone Container Corporationm- Bark Boiler 1	442950	3365390	0	-57.85	41.45	332	13.01	2.46
48	ES15	Stone Container Corporationm- Bark Boiler 1	442950	3365390	0	-7.85	41.45	332	13.01	2.46
49	ES2	Stone Container Corporationm- Bark Boiler 2	442950	3365390	0	-57.85	41.45	332	13.01	2.46
50	ES16	Stone Container Corporationm- Bark Boiler 2	442950	3365390	0	-9.35	41.45	332	13.01	2.46
51	ES12	Stone Container Corporationm- Lime Kiln 1	442950	3365390	0	-0.82	21.03	343	3.11	1.77
52	ES26	Stone Container Corporationm- Lime Kiln 1	442950	3365390	0	-0.56	21.03	343	3.11	1.77
53	ES13	Stone Container Corporationm- Lime Kiln 2	442950	3365390	0	-0.82	22.86	336	6.52	1.42
54	ES27	Stone Container Corporationm- Lime Kiln 2	442950	3365390	0	-0.67	22.86	336	6.52	1.42
55	ES14	Stone Container Corporationm- Lime Kiln 3	442950	3365390	0	-0.82	22.86	336	8.17	1.12
56	ES28	Stone Container Corporationm- Lime Kiln 3	442950	3365390	0	-0.66	22.86	336	8.17	1.12
57	ES3	Stone Container Corporationm- Pwr Boiler 1	442950	3365390	0	-42.1	32.31	455	14.02	1.83
58	ES17	Stone Container Corporationm- Pwr Boiler 1	442950	3365390	0	-40.71	32.31	455	14.02	1.83
59	ES4	Stone Container Corporationm- Pwr Boiler 2	442950	3365390	0	-61.59	32.31	439	14.51	2.13
60	ES18	Stone Container Corporationm- Pwr Boiler 2	442950	3365390	0	-59.57	32.31	439	14.51	2.13
61	ES5	Stone Container Corporationm- Pwr Boiler 3	442950	3365390	0	-61.21	32.31	439	14.51	2.13
62	ES19	Stone Container Corporationm- Pwr Boiler 3	442950	3365390	0	-59.37	32.31	439	14.51	2.13
63	ES21	Stone Container Corporationm- Recovery Boiler 1	442950	3365390	0	-15.71	38.4	345	15.61	2.74
64	ES6	Stone Container Corporationm- Recovery Boiler 1	442950	3365390	0	-12.93	38.4	341	15.97	2.59

65	ES7	Stone Container Corporationm- Recovery Boiler 2	442950	3365390	0	-16.53	38.4	345	15.61	2.74
66	ES20	Stone Container Corporationm- Recovery Boiler 2	442950	3365390	0	-12.25	38.4	341	15.97	2.59
67	ES8	Stone Container Corporationm- Recovery Boiler 3	442950	3365390	0	-16.53	38.4	344	14.6	2.74
68	ES22	Stone Container Corporationm- Recovery Boiler 3	442950	3365390	0	-15.94	38.4	344	14.6	2.74
69	ES9	Stone Container Corporationm- Smelt Dissolvign Tank 1	442950	3365390	0	-0.37	36.58	344	3.96	1.07
70	ES23	Stone Container Corporationm- Smelt Dissolvign Tank 1	442950	3365390	0	-0.35	36.58	344	3.96	1.07
71	ES10	Stone Container Corporationm- Smelt Dissolvign Tank 2	442950	3365390	0	-0.47	37.8	344	4.27	1.22
72	ES24	Stone Container Corporationm- Smelt Dissolvign Tank 2	442950	3365390	0	-0.45	37.8	344	4.27	1.22
73	ES11	Stone Container Corporationm- Smelt Dissolvign Tank 3	442950	3365390	0	-0.47	37.8	344	4.27	1.22
74	ES25	Stone Container Corporationm- Smelt Dissolvign Tank 3	442950	3365390	0	-0.45	37.8	344	4.27	1.22

	Source ID	Desciption	UTM Easting (m)	UTM Northing (m)	Elev (m)	Emission Rate (g/s)	Stack Ht (m)	Exit Temp (K)	Exit Vel (m/s)	Stack Diam (M)
JEA Brandy Branch Class 1 Cumulative Modeling Increment Consuming Sources For SO_2 PSD Modeling										
1	CBUSCH2	Anheuser Bush Jacksonville Backup Biogas Flare	440580	3366790	0	1.07	6.1	811	126.1	0.6
2	CBUSCH1	Anheuser Bush Jacksonville Biogas Flare	440580	3366790	0	1.07	6.1	811	126.1	0.6
3	CCBAY1	Ceder Bay Cogen Circ fluidized Bed Boiler 1-A	441610	3365540	0	32.17	122.9	327	36.6	4.1
4	CCBAY2	Ceder Bay Cogen Circ fluidized Bed Boiler 1-B	441610	3365540	0	32.17	122.9	327	36.6	4.1
5	CCBAY3	Ceder Bay Cogen Circ fluidized Bed Boiler 1-C	441610	3365540	0	32.17	122.9	327	36.6	4.1
6	CCBAY4	Ceder Bay Cogen Limestone Dryer	441610	3365540	0	0.03	19.2	301	28.4	1.3
7	CCBAY5	Ceder Bay Cogen Limestone Dryer	441610	3365540	0	0.03	19.2	301	28.4	1.3
8	SFP	Fire Pump	408894	3354536	0	0.0042	7.3152	615.93	60.02	0.15
9	CFPLPUTM	Florida Power and Light- Putnam	443300	3277600	0	175.85	22.3	437.4	58.6	3.15
10	CPAPER2	GA Gilman Paper -Coal Fired Boiler	448200	3401300	0	88.82	45.7	326	7.8	3.1
11	CPAPER5	GA Gilman Paper -Lime Kiln	448200	3401300	0	2.13	30.5	350	11.6	1.5
12	CPAPER1	GA Gilman Paper -Power Boiler 3	448200	3401300	0	87.36	83.8	450	2.8	4.3
13	CPAPER3	GA Gilman Paper -Recovery Boiler 2,3	448200	3401300	0	15.2	54.9	425	16.8	2.1
14	CPAPER4	GA Gilman Paper Recovery Boiler 4	448200	3401300	0	15.81	76.2	411	12.2	2.6
15	CCB4	Georgia Pacific -Palatka- Combustion Boiler No 4	434000	3283400	0	145.03	72.2	499.8	21.88	2.44
16	CLK4	Georgia Pacific -Palatka- Lime Kiln 4	434000	3283400	0	1.37	39.9	338.7	18.53	1.35
17	CPB4	Georgia Pacific -Palatka- Power Boiler No 4	434000	3283400	0	45.23	61	474.8	21.82	1.22
18	CPB5	Georgia Pacific -Palatka- Power Boiler No 5	434000	3283400	0	197.13	70.7	502.6	18.47	2.74
19	CPB6	Georgia Pacific -Palatka- Power Boiler No 6	434000	3283400	0	1.4	18.3	622	17.43	1.83
20	CRB4	Georgia Pacific -Palatka- Recovery Boiler 4	434000	3283400	0	13.85	70.1	477.6	19.42	3.66
21	CSDT4	Georgia Pacific -Palatka- Smelt Dissolving Tank 4	434000	3283400	0	1	62.8	344.3	6.46	1.52
22	CTRS	Georgia Pacific -Palatka- TRS Incinerator	434000	3283400	0	75.6	76.2	533.2	32.03	0.94
23	S1FO_3	JEA BB CT Exhaust Stack #1-Simple Cycle	408835	3354491	0	12.37	27.432	848.71	46.27	5.4864
24	S2FO1	JEA BB CT Exhaust Stack #2-Combined Cycle	408774.1	3354531	0	13.78	57.912	402.59	21.2836	5.4864
25	S3FO1	JEA BB CT Exhaust Stack #3-Combined Cycle	408713.1	3354531	0	13.78	57.912	402.59	21.2836	5.4864
26	CJEAN3	JEA Northside New Limestone Dryers	446740	3365240	0	0.035	22.9	347	15.24	1.04
27	CJEAN1	JEA Northside Repowered Unit 1	446670	3365070	0	69.71	151	330.9	19.2	4.57
28	CJEAN2	JEA Northside Repowered Unit 2	446670	3365070	0	69.71	151	330.9	19.2	4.57
29	CMILL3	Jefferson S-fit Corp - #3 Lime Kiln	439900	3359300	0	1.31	64	346	11	1.4

30	CBMILL5	Jefferson S-fit Corp - #4 Lime Kiln	456200	3394200	0	3.37	22.9	436	16.8	1.7
31	CBMILL1	Jefferson S-fit Corp - #5 Pwr Blr	456200	3394200	0	190.57	78.4	454	15.2	3.4
32	CBMILL3	Jefferson S-fit Corp - #5 RB-S or C Rec/Boiler	456200	3394200	0	45.12	88.1	484	18.9	3.9
33	CBMILL4	Jefferson S-fit Corp - #7 Pwr Blr	456200	3394200	0	154.51	103.7	441	12.8	4.5
34	CMILL1	Jefferson S-fit Corp - Black Liquor Recovery Boiler 9	439900	3359300	0	36.78	53.4	410	22.9	3.2
35	CMILL2	Jefferson S-fit Corp - No 10 Bark/Coal Boiler	439900	3359300	0	25.65	61	335	10.7	3
36	CBMILL2	Jefferson S-fit Corp -#4 Recy Blr	456200	3394200	0	40.46	80.8	493	18.6	3.5
37	CMCHEM	Milleninum Specialty Chemicals- #7 Fossil Fuel Steam Gen	436790	3360740	0	4.01	13.7	450	5.5	1.2
38	CRAY1	Rayonier Inc.- #1 Pwr Boiler	454700	3392200	0	53.21	54.9	336	9.8	3
39	CRAY2	Rayonier Inc.- #2 Pwr Boiler	454700	3392200	0	50.56	54.9	336	9.8	3
40	CRAY3	Rayonier Inc.- #3 Pwr Boiler	454700	3392200	0	55.51	54.9	329	9.8	3
41	CSEMELEC	Seminole Power Plant Units 1 and 2	438800	3289200	0	2168.8	205.7	326.5	7.99	10.97
42	CRIVER1	St. John's River Power Project Unit 1	447080	3366660	0	929.79	195.1	342	27.4	6.79
43	CRIVER2	St. John's River Power Project Unit 2	447100	3366660	0	929.79	195.1	342	27.4	6.79
44	CS1	Stone Container Corporation- Boiler 1	442950	3365390	0	0.72	61	439	5.2	2.4
45	CS2	Stone Container Corporation- Boiler 2	442950	3365390	0	0.72	61	439	5.2	2.4
46	CS3	Stone Container Corporation- Boiler 3	442950	3365390	0	0.72	61	439	5.2	2.4

Attachment C
Electronic Copy of Modeling Input and Output Files