ORLANDO UTILITIES COMMISSION
500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

VIA FEDERAL EXPRESS

August 9, 1991

Mr. G. Preston Lewis, P. E.
Review Engineer
Air Permitting and Standards Section
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Lewis:

Pursuant to our telephone conversation, I am enclosing our suggestions in order to expedite processing of our PSD Permits for Units C and D (PSD-FL-173).

We appreciate your attention on this matter. Please call me at 407/423-9141 if you have questions or comments.

Very truly yours,

J. S. Crall
Director
Environmental Division

JSC:rc
Enclosure

cc: W. H. Herrington
F. F. Haddad
K. P. Ksionek
T. D. Slepow
S. M. Day

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

FAX TRANSMITTAL LETTER

DATE: 6/19/91

TO:

NAME: JIM CRALL

AGENCY: O.U.C.

TELEPHONE: (407) 236-9616

OF PAGES (INCLUDE COVER SHEET): 2

FROM:

NAME: Preston Lewis

AGENCY: DER TALLAHASSEE

IF ANY PAGES ARE NOT CLEARLY RECEIVED, PLEASE CALL IMMEDIATELY. PHONE NO. (904) 488-1344

SENDER'S NAME: Preston

COMMENTS: Let me Know —

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

June 19, 1991

Mr. J. S. Crall
Orlando Utilities Commission
500 South Orange Avenue
P.O. Box 3193
Orlando, Florida 32802

Re: Four-Unit combustion Turbine Facility at Indian River Plant
AC 05-193720 & PSD-FL-173

Dear Mr. Crall:

I have reviewed your June 17 response to our last incompleteness letter and find the above application complete.

You indicated a desire to start construction by October. As you know the Department has received a record number of applications which has resulted in the reviews requiring the full 90 days to prepare the Preliminary Determination. The anticipated completion schedule for your application is about September 15. Should this delay your construction start date and cause an economic loss, inability to meet load requirements or other hardship, please provide me sufficient information to justify expediting the review.

Sincerely,

G. Preston Lewis, P.E.
Review Engineer
Air Permitting and Standards Section

ORLANDO UTILITIES COMMISSION
500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

June 17, 1991

Mr. C. H. Fancy, P. E.
Chief Bureau of Air Regulation
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Indian River Plant Combustion Turbine facility
AC 05-193720 and PSD FL-173.

Dear Mr. Fancy:

I appreciate your and Preston Lewis' willingness to work with OUC on the timeliness of this permit.

Attached please find the additional information you requested as supplied by:

1. Black & Veatch
2. OUC's System Planning Division
3. OUC's System Operations Division

Please call me when you receive this transmittal and let me know, at your earliest convenience, when you can deem the application complete.

Sincerely,

J. S. Crall
Director
Environmental Division

RECEIVED
JUN 18 1991
Division of Air
Resources Management

JSC:rc
Attachment

cc: B. Andrews - DER, Tallahassee
P. Lewis - DER, Tallahassee
S. Day - B&V

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Jim Crell

Your Phone Number (Very Important) (407) 423-9100

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To (Recipient's Name) Please Print
Mr. C. H. Fancy, P. E.

Recipient's Phone Number (Very Important) 904 488-13

Company Chief Bureau of Air Regulation

Department/Floor No.

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1. In Question 7, we asked that you "discuss the impact should the capacity factor be limited to 25 percent." The response needs to include the modification of Tables 3-1 and 3-2 for each fuel used. Please provide these modified tables.

   Table 3-1 would not change if the capacity factor was limited to 25 percent. The attached Table 3-2 shows the resulting emissions based on a 25 percent capacity factor. These annual emissions rates would be the maximum potential annual emissions from the sum of all four combustion turbines.

   The incremental cost for NO_x reduction would significantly increase as well. The incremental NO_x removal cost at a 25 percent annual capacity factor would be increased from the previously stated 7,060 $/ton to 12,370 $/ton and from the previously stated 5,200 $/ton to 8,510 $/ton for natural gas and oil, respectively.

2. In Question 8, the response needs to discuss how relevant the BACT costs for NO_x control would be (provided in Chapter 4) should these units be modified for combined cycle usage? Also, would the emission data provided in Chapter 4 be representative should conversion occur?

   The cost for equipment shown in Chapter 4 would no longer be relevant if the units were converted to combined cycle. Since the HRSG would cool the flue gas to the appropriate SCR temperatures, the additional water treatment, storage, and injection equipment would no longer be needed. However, the annual operating costs would remain relatively unchanged. The new BACT costs would be roughly equivalent to those determined by the DER in its analysis of the City of Lakeland's PSD permit application for a 120 MW GE Frame 7 combined cycle unit which ranged from 4,600 $/ton on oil at 100 percent capacity factor to 6,441 $/ton on natural gas at 100 percent capacity factor (reference DER Technical Evaluation and Preliminary Determination for AC53-190437; PSD-FL-166 dated March 15, 1991).

   The emissions from the combustion turbines would not be affected by the addition of HRSG

TABLE 3-2***
POTENTIAL ANNUAL
EMISSION

POLLUTANT	2-GE (tons)	2-WH (tons)*	4-GE (tons)**	PROPOSED NET INCREASE (tons)*	PSD SIGNIFICANCE LEVEL (tons)	NET SIGNIFICANCE INCREASE
CO	88	159	176	71	100	NO
NOX	1036	440	2072	-596	40	NO
SO2	1234	839	2468	-395	40	NO
TSP	175	210	350	35	25	YES
PM10	175	210	350	35	15	YES
VOC	36	101	72	65	40	YES
LEAD	0.1	0.1	0.2	0	0.6	NO
ASBESTOS	NEGL	NEGL	NEGL	NEGL	0.007	NO
BERYLLIUM	0.01	0.01	0.02	0	0.0004	NO
MERCURY	0.01	0.01	0.02	0	0.1	NO
VINYL CHLORIDE	NEGL	NEGL	NEGL	NEGL	1	NO
FLOUROIDES	NEGL	NEGL	NEGL	NEGL	3	NO
H2S04 MIST	37	2	74	-35	7	NO
TOTAL REDUCED S	NEGL	NEGL	NEGL	NEGL	10	NO
REDUCED S	NEGL	NEGL	NEGL	NEGL	10	NO
H2S	NEGL	NEGL	NEGL	NEGL	10	NO

*EMISSIONS ARE BASED ON A 25 PERCENT ANNUAL CAPACITY FACTOR FOR THE 2-WH TURBINES.

**CURRENTLY PERMITTED LEVEL.

***REVISED 6/14/91 FOR 25 PERCENT ANNUAL CAPACITY FACTOR.

June 15, 1991

TO: J.S. CRALL

DIRECTOR, ENVIRONMENTAL DIVISION

FROM: R.C. ZELL RCZ

DATE: JUNE 14, 1991

RE: INDIAN RIVER COMBUSTION TURBINE C & D PROJECTIONS

THE ANTICIPATED COMBINED SERVICE HOURS AND CAPACITY FACTORS FOR THE INDIAN RIVER COMBUSTION TURBINES C & D FOR THE 1993 - 1996 TIME PERIOD ARE AS FOLLOWS:

	HOURS	CAPACITY FACTOR (%)
1993	3360	19.2
1994	3944	22.5
1995	4860	27.7
1996	5526	31.5

THESE FIGURES WERE DEVELOPED USING SYSTEM PLANNING'S RECENTLY COMPLETED BUDGET PRODUCTION COST RUNS AND INFORMATION FROM SYSTEM OPERATIONS' TOM WASHBURN REGARDING FLORIDA MUNICIPAL POWER AGENCY'S SHARE UTILIZATION.

CC: W.H. HERRINGTON

G.F. ERICKSON

T.E. WASHBURN

TELEPHONE MEMORANDUM

DATE: June 17, 1991 TIME: 9:35 AM

PARTY INITIATING CALL: J. S. Crall, Director Environmental Division

TO: G. P. Cullifer, Chief Load Dispatcher System Operations Division

SUBJECT: Anticipated Operation of Combustion Turbines C and D

Conversation: Combustion Turbines C and D are anticipated to be operated in a similar manner as A and B. When the system pool requirement calls for CTs, we start them and bring them up with the load.

We anticipate that 75-80% of operation will be at the nominal rated capacity, less than 10% of operation will be at 25% of nominal rated capacity and the remaining 10-15% of operation will be following load somewhere in between.

TELECOPY

TRANSMITTAL SHEET

ORLANDO UTILITIES COMMISSION

DATE: 6/7/91 TIME: 2:35

PAGES SENT INCLUDING TRANSMITTAL SHEET: 6

SENT TO: C. H. Fancy

COMPANY: DER

CITY: Tallahassee

TELECOPY NUMBER: 904/922-6979

Jim CRALL OUC EXT. 407/423-9141

COMMENTS: Please deliver ASAP.

ORLANDO UTILITIES COMMISSION

TELECOPY NUMBER: (407) 236-9616

FOR PROBLEMS OR QUESTIONS CONCERNING THIS TRANSMITTAL CALL (407) 423-9100 - EXT. 2049

F.I.C (Reg)

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

June 7, 1991

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. J. S. Crall
Orlando Utilities Commission
500 South Orange Avenue
P. O. Box 3193
Orlando, Florida 32802

Re: Four-Unit Combustion Turbine Facility at Indian River Plant
AC 05-193720 & PSD-FL-173

Dear Mr. Crall:

The Department has reviewed your May 9, 1991 letter as a response to an incompleteness letter to the above referenced application package. The response to questions Nos. 7 and 8 are incomplete and need further clarification. Therefore, please submit the following information, including all assumptions, calculations and reference material, to the Department's Bureau of Air Regulation and processing of your application package will resume:

1. In Question 7, we asked that you "discuss the impact should the capacity factor be limited to 25 percent." The response needs to include the modification of Tables 3-1 and 3-2 for each fuel used. Please provide these modified tables. Also, provide the 1991-1993 projected (anticipated) service hours and loading (peak, base or minimum).

2. In Question 8, the response needs to discuss how relevant the BACT costs for NOx control would be (provided in Chapter 4) should these units be modified for combined cycle usage? Also, would the emission data provided in Chapter 4 be representative should conversion occur?

If you have any questions, please call Preston Lewis at 904-488-1344 or write to me at the above address.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/PL/plm

c: C. Collins, Central District
J. Harper, EPA
S. M. Day, P.E., B&V
Preston Lewis } 6-7-91
Read'g File }

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Orlando Utilities Comm.
500 S Orange Ave
P.O. Box 3193
Orlando, FL 32802

4. Article Number
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AC 05-193720
PSO-FL-173

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ORLANDO UTILITIES COMMISSION
500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

May 9, 1991

Mr. C. H. Fancy, Chief
Bureau of Air Regulation
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Combustion Turbine Facility
Indian River Plant
AC 05-193720 - PSD-FL-173

Dear Mr. Fancy:

Enclosed are OUC's responses to your letter of April 5, 1991 requesting additional information on our March 7 submittal, regarding the subject facility. These responses also incorporate FDER's requests made during the April 23, 1991 meeting with Barry Andrews, in Tallahassee, and include the supporting dispersion modeling documentation.

I trust that this information will render our application complete and request that FDER resume the processing within adequate time to meet an October 1, 1991 commence construction date.

If you have questions concerning the responses, please call me at 407/423-9141 or Mr. Steve Day (Black & Veatch) at 913/339-2880.

Very truly yours,

Robert F. Reiche for

J. S. Crall
Director
Environmental Division

JSC:rc
Enclosure

cc: W. H. Herrington
F. F. Haddad
K. P. Ksionek
T. D. Slepow
S. M. Day (B&V)
B. Andrews (DER - Tall.)

P. Lewis
M. Ewing
C. Collins, EPA
J. Kaupa, EPA

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Company Bureau of Air Regulation
Fla. Dept. of Environmental Regulation

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OUC - INDIAN RIVER
PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMIT APPLICATION

ATTACHMENT - RESPONSES TO FDER COMMENTS

QUESTION 1

Please provide a complete list of all interacting sources considered in the analysis. In addition, please provide the calculations or modeling used to eliminate any interacting source from final modeling consideration.

Response 1

In order to evaluate SO_2 ambient air quality standards (AAQS) and PSD increment compliance, interacting sources were included in the air dispersion modeling analysis. As discussed in Section 6.4.1 of the OUC Indian River PSD permit application, a list of potential interacting sources was obtained from the Florida Department of Environmental Regulations (FDER)--Bureau of Air Quality Management for sources located within the project's screening area. The screening area is defined as the area circumscribed by a circle with a radius equal to the significant impact area of 0.6 kilometers plus 50 kilometers (50.6 kilometers total). Because sources are grouped by counties in the FDER database, some SO_2 sources outside of the screening area were also included in the initial inventory list.

The inventory list contained information regarding source location, identification, and allowable SO_2 emissions. The complete list of FDER inventory sources is given in the attached Table 1.

The following four steps were used to eliminate sources from the inventory for the AAQS and PSD analyses. These methods were discussed in Section 6.4.1 of the PSD permit application.

1) Using the source locations, the distance to the OUC Indian River facility was determined. All sources further than 50.6 kilometers were eliminated from further analysis.

2) The remaining sources were initially evaluated using a "screening threshold" method developed by the North Carolina Bureau of Air Quality. The North Carolina method is based on a relationship of allowable emissions and distance to the proposed source. The formula for this method is listed below.

$Q = 20D$ Where Q is allowable source emissions given in tpy, and D is the distance to the proposed OUC Indian River source in kilometers.

If the "ratio" (Q/D) was calculated to be less than 20, the source was eliminated from the inventory. In the case where a single facility has multiple sources, facility emissions, instead of source emissions, were used to determine ratios. Because the ratio for the NASA-Kennedy Space Center facility was just slightly less than 20, these sources were evaluated further.

3) The next step was to obtain a master detail list, including stack parameters and UTM coordinates, from the FDER for the remaining inventory sources.

4) For the remaining sources, screening-level modeling was performed with EPA's SCREEN dispersion model. SCREEN is a first level screening model that calculates 1-hour concentrations assuming worst-case meteorological conditions. The screening-level modeling is included with this attachment. Each of the remaining sources were modeled using their respective allowable SO_2 emission rate and combustion parameters to determine a 1-hour ground-level impact at the nearest Indian River significant impact area boundary. The 1-hour values were converted to 24-hour values by multiplying the impacts by a factor of 0.4 per EPA guidance document EPA-450/4-88-010. The project only had significant SO_2 24-hour offsite impacts. Therefore, it was not necessary to assess the other sources' impacts for different averaging periods.

   The 24-hour values were then compared to the 24-hour SO_2 significant impact level of 5 ug/m^3. This modeling demonstrated that several of the remaining sources have predicted 24-hour SO_2 impacts exceeding 5 ug/m^3. These sources were included in the final analysis and are listed as sources 83, and 92 through 95 in Table 1.

QUESTION 2

Please provide a figure detailing the plant's boundary and the location of boundary receptors used in the modeling analysis. Also, provide a discussion detailing what measures are in place to prohibit public access to the plant's property.

Response 2

The plant boundary and the modeled boundary receptors are shown in attached Figure 1. As shown, receptors are located at approximately 200-meter intervals

along the property boundary. The coordinates of these receptors relative to the Unit A combustion turbine stack were listed in the modeling output provided as part of the PSD permit application.

A chain link fence is located around the perimeter of the property boundary. This fence prohibits public access onto the plant property.

QUESTION 3

Please identify which monitor was used to establish the background concentration for sulfur dioxide. During what time period was this data obtained?

Response 3

As stated in Section 6.4.2 of the PSD application, a background concentration of 44 ug/m^3 was added to the modeled 24-hour SO_2 impact from the OUC Indian River plant. This concentration was obtained from the ambient monitoring station located at the OUC Stanton Energy Center (SEC). This location was selected after considering the availability of data from FDER and independent monitoring networks. A review of FDER's 1986 Air Quality Monitoring Report identified that FDER did not have a location in close proximity to the project site.

The SEC monitoring site is approximately 20 miles west of the OUC Indian River plant. OUC has been continuously monitoring ambient SO_2 concentrations at this site since 1980. The site has continuously met PSD monitoring criteria and is assumed to conservatively represent background air quality conditions in this part of Florida.

The value used for the OUC Indian River PSD application represents the highest measured 24-hour concentration during the 1980-1988 monitoring period. As of 1989, data reporting was no longer required for permitting purposes at SEC and the data are not readily available.

QUESTION 4

For the AAQS and PSD analyses, the modeling of only the two receptors that indicated a significant impact is insufficient. The entire off-site significant impact area must be modeled.

Response 4

OUC and B&V met with the FDER on April 23, 1991 to discuss FDER's concerns regarding the recent PSD permit application. As the result of this meeting, B&V has performed additional modeling for varying turbine operating scenarios. Specific information regarding the operating scenarios is given in Responses 5 & 6.

The significant impact areas for the various scenarios were determined with modeled offsite receptors placed at 10 degree increments along the following rings:

- 100-meter intervals from 200 to 600 meters,
- 250-meter intervals from 750 to 1,000 meters,
- 500-meter intervals from 1,500 meters to 5,000 meters,
- 1,000-meter intervals from 6,000 to 15,000 meters, and
- 20,000 meters.

This modeling resulted in the same significant impact distance (600 meters) as the initial modeling for SO_2. The 24-hour averaging period was once again the only averaging period which exceeded the significant impact criteria.

Those offsite receptors that were within the 600-meter radius were included in the AAQS and PSD modeling analyses. The modeling results for the various operating scenarios are summarized in Tables 2 and 3. The highest, highest second-highest 3-hour SO_2 concentration was predicted to be 22.7 ug/m^3. This receptor location was along eastern plant fenceline. This concentration was below EPA's significance level of 25 ug/m^3.

The associated operating scenario assumed that all combustion turbines were firing oil at a minimum potential operating load with performance characteristics associated with a 104 F ambient temperature. This scenario is very conservative in that the facility would not realistically operate at minimum load for all turbines. For this situation, it would be more economical for one or two turbines to operate at baseload rather than four at minimum loads. The same operating scenario resulted in the maximum 24-hour SO_2 concentration of 6.5 ug/m^3. The annual impacts were about 0.4 ug/m^3 and well below the 1.0 ug/m^3 significance levels. These predicted project impacts were about only 10 percent higher than those included in the initial application submittal.

Table 3 summarizes the SO_2 24-hour impacts for the AAQS and PSD analyses. The AAQS analysis included the same potential interacting sources as initially modeled. The revised modeling for the project and these sources resulted in a maximum predicted impact of 88.7 ug/m^3. Considering a background level of 44 ug/m^3, the total impact was about 133 ug/m^3 or about 51 percent of the Florida 24-hour SO_2 standard of 260 ug/m^3. The PSD Class II SO_2 increment consumption was predicted to be only 16.2 ug/m^3 or approximately 18 percent of allowed increment.

Paper and diskette copies of this additional air quality modeling have been included with these responses.

Table 2
Project Maximum Impacts for Various Operational Scenarios

	Peak/20 F	Base/ISO	Min/104 F
3-Hour SO2 Impacts			
PSD Significance Level (ug/m^3)	25	25	25
Project Impacts (ug/m^3)	21	19.8	22.7
Receptor Location (m/deg)	13,000/180	498.3/95	446.5/90
Year	1982	1985	1983
Day/Period	68/2	43/1	83/6
24-Hour SO2 Impacts			
PSD Significance Level (ug/m^3)	5.0	5.0	5.0
Project Impacts (ug/m^3)	5.8	5.9	6.5
Receptor Location (m/deg)	446.5/90	446.5/90	446.5/90
Year	1985	1985	1985
Day	137	137	137
Annual SO2 Impacts			
PSD Significant Level (ug/m^3)	1.0	1.0	130
Project Impacts (ug/m^3)	0.4	0.4	0.3
Receptor Location (m/deg)	10,000/240	10,000/240	7,000/240
Year	1984	1984	1984

Table 3
AAQS and PSD Modeling Analysis

	AAQS	PSD Class II
Maximum 24-hour SO_2 Impact (ug/m^3)	88.7	16.2
Location (m/deg)	600/240	446.5/90
Year/Day	1984/215	1985/137
Background (ug/m^3)	44	--
Total Impacts (ug/m^3)	132.7	16.2
Standard/Increment (ug/m^3)	260	91
Percent of Standard/Increment	51	18

QUESTION 5

The permitted emission rates for the existing units do not coincide with those listed in Table 3.1 of the new application. Please explain.

QUESTION 6

The new application stack parameters given in Table 3-1 for the existing units do not coincide with information given in original application. Please explain.

Response 5 and 6

The emission rates and stack parameters modeled for the original combustion turbine PSD application (1988) were based on manufacturer's performance data. The GE Frame 6 combustion turbines were assumed to operate at base load and ambient conditions of 14.7 psi atmospheric pressure, 59 F dry bulb temperature, and 60 percent relative humidity (International Standard Operating conditions). The permit as issued allows for adjustments to the maximum heat input rate based on ambient temperature. Maximum heat input at the site would occur at an ambient temperature of 20 F.

For a more conservative approach, the GE Frame 6 and Westinghouse combustion turbines were modeled for this PSD permit application amendment with stack and emission parameters corresponding to 20 F ambient temperature (year around). These conditions represent the 3-hour maximum potential pollutant emission rates and in this amendment have been conservatively used for the entire year. The combustion turbine source parameters and their corresponding ambient conditions were documented in Table 3-1 of the PSD permit application.

At a subsequent meeting on April 23, 1991, the FDER requested that additional operating scenarios be evaluated by air quality modeling. To comply with that request, B&V has identified various potential worse case operating scenarios. The specific modeling parameters for these scenarios are included in Table 4. These scenarios conservatively represent the maximum emission rate and heat input, standard operating conditions, and minimum flow volume and heat input, respectively for all four turbines.

- Scenario 1. Ambient temperature of 20 F and peak load.
- Scenario 2. Ambient temperature 59 F (ISO conditions) and baseload.
- Scenario 3. Ambient temperature of 104 F and minimum load.

Each of these scenarios was modeled with the ISCST dispersion model and the five years of meteorological data. From the modeling, the extent of any significant impact areas and the maximum predicted impacts were determined. As shown in Response 4, Scenario 3 resulted in the highest predicted impacts and was the only scenario considered further for the PSD and AAQS analyses.

QUESTION 7

Usually, simple cycle combustion turbines are used for peaking generation services. In your application, you state the units will operate 8,760 hours. Are these units going to be used for peaking? If so, what are the projected actual service hour? Discuss the impact should the capacity factor be limited to 25 percent.

QUESTION 8

Do you have any plans to convert these units from simple, cycle to combined cycle? If so, when would this be done? Please discuss.

Response 7 and 8

The OUC Indian River Units C and D will be constructed as simple cycle units. Units in Florida are dispatched on the most economical basis with those having the highest cost to operate being the last units to be dispatched. Although simple cycle units are the least expensive plants to build, they are currently the most expensive to operate and therefore, are the last to be dispatched. Therefore, at least initially, the units will be used for peaking capacity and annual capacity factors are expected to be low.

OUC does not have any current plans to convert these units to combined cycle. However, the units are being designed with space available to add heat recovery steam generators in the future. As the capacity factor of the units increase, OUC will need to add additional base load or intermediate load units. This can be accomplished by adding the heat recovery steam generators at the Indian River plant site or by other means. With the proposed addition of Stanton 2, the OUC system should have sufficient baseload capacity for the remainder of the 1990's. Therefore, the decision for the next facility will not be made until later.

OUC has requested 8,760 hours per year in order to provide the maximum flexibility in the operation of the units. A portion of the units are owned by others and their requirements will affect the use of the units as well as OUC's requirements, the availability of other units in OUC's system, and economy sales and purchases from the broker system. There are no air quality impact reasons for limiting the annual capacity factor since all annual increments and standards will be maintained without such a limit. From a BACT standpoint, OUC does not see a need to request a limitation to the annual capacity factor, since the cost of adding SCR to a simple cycle unit for NO_x control is already well in excess of prior BACT levels. If FDER restricts the annual capacity factor, it will have no effect on the operation of the unit unless OUC desires to exceed the arbitrary limit set by the FDER. In that case, OUC would be forced to file for an amendment to the permit to increase the limit set by the FDER and perhaps need

to request an emergency order if the limit interfered with OUC's ability to meet load demands. OUC would be comfortable with permit conditions that included a 100 percent capacity factor on natural gas and 25 percent annual capacity factor for No. 2 fuel oil.

TABLE 4
COMBUSTION PARAMETERS FOR VARIOUS OPERATIONAL SCENARIOS

PARAMETERS	PEAK LOAD/20 F TEMP		BASE LOAD/ISO		MINIMUM LOAD/104 F TEMP*	
	GE FRAME 6	WESTINGHOUSE 501-D5	GE FRAME 6	WESTINGHOUSE 501-D5	GE FRAME 6	WESTINGHOUSE 501-D5
STACK HEIGHT (FT)	36	50	36	50	36	50
STACK DIAMETER (FT)	12.36	22.14	12.36	22.14	12.36	22.14
VOLUMETRIC FLOW RATE (ACFM)	786290	1970269	697015	1818355	384646	1267144
STACK EXIT VELOCITY (FPM)	6552	5117	5808	4723	3205.8	3291.4
TEMPERATURE (F)	1035	977	1003	976	648	674
STACK EMISSIONS:						
SO2 (G/S/UNIT)	21.7	54.8	17.74	48.27	4.91	21.87
NOx (G/S/UNIT)	18.6	29.1	14.9	28.48	4.16	10.46
CO (G/S/UNIT)	1.5	9.1	1.26	9.1	1.89	7.62
PM (G/S/UNIT)	3.1	13.6	1.26	13.4	1.49	6.2

ORLANDO UTILITIES COMMISSION

500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 407/423-9100

May 9, 1991

Mr. C. H. Fancy, Chief
Bureau of Air Regulation
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Combustion Turbine Facility
Indian River Plant
AC 05-193720 - PSD-FL-173

Dear Mr. Fancy:

Enclosed are OUC's responses to your letter of April 5, 1991 requesting additional information on our March 7 submittal, regarding the subject facility. These responses also incorporate FDER's requests made during the April 23, 1991 meeting with Barry Andrews, in Tallahassee, and include the supporting dispersion modeling documentation.

I trust that this information will render our application complete and request that FDER resume the processing within adequate time to meet an October 1, 1991 commence construction date.

If you have questions concerning the responses, please call me at 407/423-9141 or Mr. Steve Day (Black & Veatch) at 913/339-2880.

Very truly yours,

Robert F. Hicks for

J. S. Crall
Director
Environmental Division

JSC:rc
Enclosure

cc: W. H. Herrington
F. F. Haddad
K. P. Ksionek
T. D. Slepow
S. M. Day (B&V)
B. Andrews (DER - Tall.)

R. Lewis
W. Ellis
C. Collins EPA Dist.
J. Harper EPA

OUC - INDIAN RIVER
PREVENTION OF SIGNIFICANT DETERIORATION (PSD) PERMIT APPLICATION

ATTACHMENT - RESPONSES TO FDER COMMENTS

QUESTION 1

Please provide a complete list of all interacting sources considered in the analysis. In addition, please provide the calculations or modeling used to eliminate any interacting source from final modeling consideration.

Response 1

In order to evaluate SO_2 ambient air quality standards (AAQS) and PSD increment compliance, interacting sources were included in the air dispersion modeling analysis. As discussed in Section 6.4.1 of the OUC Indian River PSD permit application, a list of potential interacting sources was obtained from the Florida Department of Environmental Regulations (FDER)--Bureau of Air Quality Management for sources located within the project's screening area. The screening area is defined as the area circumscribed by a circle with a radius equal to the significant impact area of 0.6 kilometers plus 50 kilometers (50.6 kilometers total). Because sources are grouped by counties in the FDER database, some SO_2 sources outside of the screening area were also included in the initial inventory list.

Not Clear to us Clear Area Per Mal 6/7/91

The inventory list contained information regarding source location, identification, and allowable SO_2 emissions. The complete list of FDER inventory sources is given in the attached Table 1.

The following four steps were used to eliminate sources from the inventory for the AAQS and PSD analyses. These methods were discussed in Section 6.4.1 of the PSD permit application.

1) Using the source locations, the distance to the OUC Indian River facility was determined. All sources further than 50.6 kilometers were eliminated from further analysis.

2) The remaining sources were initially evaluated using a "screening threshold" method developed by the North Carolina Bureau of Air Quality. The North Carolina method is based on a relationship of allowable emissions and distance to the proposed source. The formula for this method is listed below.

$Q = 20D$ Where Q is allowable source emissions given in tpy, and D is the distance to the proposed OUC Indian River source in kilometers.

If the "ratio" (Q/D) was calculated to be less than 20, the source was eliminated from the inventory. In the case where a single facility has multiple sources, facility emissions, instead of source emissions, were used to determine ratios. Because the ratio for the NASA-Kennedy Space Center facility was just slightly less than 20, these sources were evaluated further.

3) The next step was to obtain a master detail list, including stack parameters and UTM coordinates, from the FDER for the remaining inventory sources.

4) For the remaining sources, screening-level modeling was performed with EPA's SCREEN dispersion model. SCREEN is a first level screening model that calculates 1-hour concentrations assuming worst-case meteorological conditions. The screening-level modeling is included with this attachment. Each of the remaining sources were modeled using their respective allowable SO_2 emission rate and combustion parameters to determine a 1-hour ground-level impact at the nearest Indian River significant impact area boundary. The 1-hour values were converted to 24-hour values by multiplying the impacts by a factor of 0.4 per EPA guidance document EPA-450/4-88-010. The project only had significant SO_2 24-hour offsite impacts. Therefore, it was not necessary to assess the other sources' impacts for different averaging periods.

The 24-hour values were then compared to the 24-hour SO_2 significant impact level of 5 ug/m^3. This modeling demonstrated that several of the remaining sources have predicted 24-hour SO_2 impacts exceeding 5 ug/m^3. These sources were included in the final analysis and are listed as sources 83, and 92 through 95 in Table 1.

QUESTION 2

Please provide a figure detailing the plant's boundary and the location of boundary receptors used in the modeling analysis. Also, provide a discussion detailing what measures are in place to prohibit public access to the plant's property.

Response 2

The plant boundary and the modeled boundary receptors are shown in attached Figure 1. As shown, receptors are located at approximately 200-meter intervals

along the property boundary. The coordinates of these receptors relative to the Unit A combustion turbine stack were listed in the modeling output provided as part of the PSD permit application.

A chain link fence is located around the perimeter of the property boundary. This fence prohibits public access onto the plant property.

QUESTION 3

Please identify which monitor was used to establish the background concentration for sulfur dioxide. During what time period was this data obtained?

Response 3

As stated in Section 6.4.2 of the PSD application, a background concentration of 44 ug/m^3 was added to the modeled 24-hour SO_2 impact from the OUC Indian River plant. This concentration was obtained from the ambient monitoring station located at the OUC Stanton Energy Center (SEC). This location was selected after considering the availability of data from FDER and independent monitoring networks. A review of FDER's 1986 Air Quality Monitoring Report identified that FDER did not have a location in close proximity to the project site.

The SEC monitoring site is approximately 20 miles west of the OUC Indian River plant. OUC has been continuously monitoring ambient SO_2 concentrations at this site since 1980. The site has continuously met PSD monitoring criteria and is assumed to conservatively represent background air quality conditions in this part of Florida.

The value used for the OUC Indian River PSD application represents the highest measured 24-hour concentration during the 1980-1988 monitoring period. As of 1989, data reporting was no longer required for permitting purposes at SEC and the data are not readily available.

QUESTION 4

For the AAQS and PSD analyses, the modeling of only the two receptors that indicated a significant impact is insufficient. The entire off-site significant impact area must be modeled.

Response 4

OUC and B&V met with the FDER on April 23, 1991 to discuss FDER's concerns regarding the recent PSD permit application. As the result of this meeting, B&V has performed additional modeling for varying turbine operating scenarios. Specific information regarding the operating scenarios is given in Responses 5 & 6.

The significant impact areas for the various scenarios were determined with modeled offsite receptors placed at 10 degree increments along the following rings:

- 100-meter intervals from 200 to 600 meters,
- 250-meter intervals from 750 to 1,000 meters,
- 500-meter intervals from 1,500 meters to 5,000 meters,
- 1,000-meter intervals from 6,000 to 15,000 meters, and
- 20,000 meters.

This modeling resulted in the same significant impact distance (600 meters) as the initial modeling for SO_2. The 24-hour averaging period was once again the only averaging period which exceeded the significant impact criteria.

Those offsite receptors that were within the 600-meter radius were included in the AAQS and PSD modeling analyses. The modeling results for the various operating scenarios are summarized in Tables 2 and 3. The highest, highest second-highest 3-hour SO_2 concentration was predicted to be 22.7 ug/m^3. This receptor location was along eastern plant fenceline. This concentration was below EPA's significance level of 25 ug/m^3.

The associated operating scenario assumed that all combustion turbines were firing oil at a minimum potential operating load with performance characteristics associated with a 104 F ambient temperature. This scenario is very conservative in that the facility would not realistically operate at minimum load for all turbines. For this situation, it would be more economical for one or two turbines to operate at baseload rather than four at minimum loads. The same operating scenario resulted in the maximum 24-hour SO_2 concentration of 6.5 ug/m^3. The annual impacts were about 0.4 ug/m^3 and well below the 1.0 ug/m^3 significance levels. These predicted project impacts were about only 10 percent higher than those included in the initial application submittal.

Table 3 summarizes the SO_2 24-hour impacts for the AAQS and PSD analyses. The AAQS analysis included the same potential interacting sources as initially modeled. The revised modeling for the project and these sources resulted in a maximum predicted impact of 88.7 ug/m^3. Considering a background level of 44 ug/m^3, the total impact was about 133 ug/m^3 or about 51 percent of the Florida 24-hour SO_2 standard of 260 ug/m^3. The PSD Class II SO_2 increment consumption was predicted to be only 16.2 ug/m^3 or approximately 18 percent of allowed increment.

Paper and diskette copies of this additional air quality modeling have been included with these responses.

Table 2
Project Maximum Impacts for Various Operational Scenarios

	Peak/20 F	Base/ISO	Min/104 F
3-Hour SO2 Impacts			
PSD Significance Level (ug/m^3)	25	25	25
Project Impacts (ug/m^3)	21	19.8	22.7
Receptor Location (m/deg)	13,000/180	498.3/95	446.5/90
Year	1982	1985	1983
Day/Period	68/2	43/1	83/6
24-Hour SO2 Impacts			
PSD Significance Level (ug/m^3)	5.0	5.0	5.0
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Day	137	137	137
Annual SO2 Impacts			
PSD Significant Level (ug/m^3)	1.0	1.0	130
Project Impacts (ug/m^3)	0.4	0.4	0.3
Receptor Location (m/deg)	10,000/240	10,000/240	7,000/240
Year	1984	1984	1984

Table 3
AAQS and PSD Modeling Analysis

	AAQS	PSD Class II
Maximum 24-hour SO_2 Impact (ug/m^3)	88.7	16.2
Location (m/deg)	600/240	446.5/90
Year/Day	1984/215	1985/137
Background (ug/m^3)	44	--
Total Impacts (ug/m^3)	132.7	16.2
Standard/Increment (ug/m^3)	260	91
Percent of Standard/Increment	51	18

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The new application stack parameters given in Table 3-1 for the existing units do not coincide with information given in original application. Please explain.

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QUESTION 7

Usually, simple cycle combustion turbines are used for peaking generation services. In your application, you state the units will operate 8,760 hours. Are these units going to be used for peaking? If so, what are the projected actual service hour? Discuss the impact should the capacity factor be limited to 25 percent.

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Do you have any plans to convert these units from simple, cycle to combined cycle? If so, when would this be done? Please discuss.

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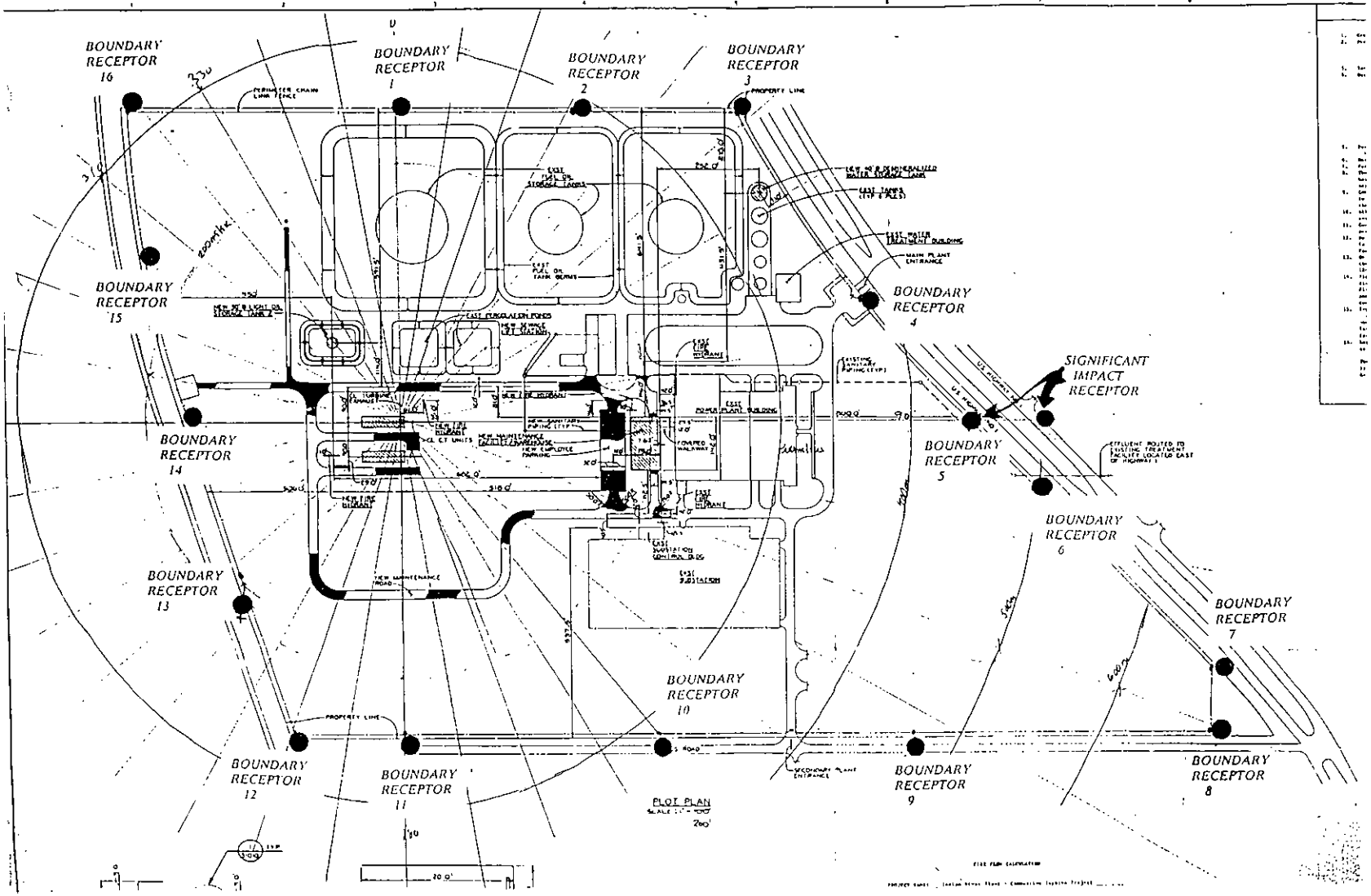
to request an emergency order if the limit interfered with OUC's ability to meet load demands. OUC would be comfortable with permit conditions that included a 100 percent capacity factor on natural gas and 25 percent annual capacity factor for No. 2 fuel oil.

FIGURE 1



1" = 260'

File Copy

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

April 5, 1991

J. S. Crall
Orlando Utilities Commission
500 South Orange Avenue
P. O. Box 3193
Orlando, Florida 32802

Re: Four-Unit Combustion Turbine Facility at Indian River Plant
AC 05-193720 - PSD-FL-173

Dear Mr. Crall:

We have reviewed your March 7 application concerning the above referenced permit and find it to be incomplete. If the question requests air pollution emissions information, please respond on each fuel authorized to burn. The processing of your application will resume upon receipt of the following information:

1. Please provide a complete list of all interacting sources considered in the analysis. In addition, please provide the calculations or modeling used to eliminate any interacting source from final modeling consideration.

2. Please provide a figure detailing the plant's boundary and the location of boundary receptors used in the modeling analysis. Also, provide a discussion detailing what measures are in place to prohibit public access to the plant's property.

3. Please identify which monitor was used to establish the background concentration for sulfur dioxide. During what time period was this data obtained?

4. For the AAQS and PSD analyses, the modeling of only the two receptors that indicated a significant impact is insufficient. The entire off-site significant impact area must be modeled.

5. The permitted emission rates for the existing units do not coincide with those listed in Table 3.1 of the new application. Please explain.

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peaking? If so, what are the projected actual service hours? Discuss the impact should the capacity factor be limited to 25%.

8. Do you have any plans to convert these units from simple cycle to combined cycle? If so, when would this be done? Please discuss.

If you have any questions, please call Preston Lewis at 904-488-1344 or write to me at the above address.

Sincerely,

Barry S. Andrews

for C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/PL/plm

c: C. Collins, Central District
J. Harper, EPA
S. M. Day, P.E., B&V

Preston Lewis
Max Linn
Ready File
} 4-5-91 RAM

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☒ Show to whom delivered, date, and addressee's address. (*Extra charge*) 2. ☐ Restricted Delivery (*Extra charge*)

3. Article Addressed to:
Mr. J. S. Crall
OUC
500 So. Orange Ave.
P.O. Box 3193
Orlando, FL 32802

4. Article Number
P 407 852 646

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Addressee
X

6. Signature — Agent
X

7. Date of Delivery

8. Addressee's Address (*ONLY if requested and fee paid*)

Form 3811, Apr. 1989 *U.S.G.P.O. 1989-238-815 DOMESTIC RETURN RECEIPT

P 407 852 646

RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to Mr. J. S. Crall
OUC
Street and No. 500 South Orange Ave.
P.O. Box 3193
P.O. State and ZIP Code Orlando, FL 32802

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date	mailed: 4/5/91 AC 05-193720 PSD-FL-173

PS Form 3800, June 1985 *U.S.G.P.O. 1989-234-555

Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

March 19, 1991

Ms. Jewell A. Harper, Chief
Air Enforcement Branch
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Ms. Harper:

RE: Orlando Utilities Commission
Indian River Plant
Brevard County, PSD-FL-173

Enclosed for your review and comment is the above referenced PSD permit application. If you have any comments or questions, please contact Preston Lewis or Max Linn at the above address or at (904)488-1344.

Sincerely,

Patricia G. Adams

Patricia G. Adams
Planner
Bureau of Air Regulation

/pa

Enclosure