ORLANDO UTILITIES COMMISSION
500 SOUTH ORANGE AVENUE • P. O. BOX 3193 • ORLANDO, FLORIDA 32802 • 305/423-9100

November 6, 1981

Mr. H. S. Oven
Florida Department of
Environmental Regulation
Twin Towers Office Bldg.
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Oven:

In accordance with your letter of August 1, 1981, concerning air quality matters related to the Stanton Energy Center, Units 1 and 2 Site Certification Application and PSD application, our consultants, Black & Veatch, have prepared the enclosed response.

Attachment 1 to these responses consists of many pages of computer printouts and only one copy has been submitted. This copy of Attachment 1 has been enclosed with the copy of this letter sent to Steve Smallwood, Chief of the Bureau of Air Quality Management.

Should, after review, you desire any or all of the attached amended into the applications, please advise.

Sincerely yours,

B. E. Shoup
B. E. Shoup
Director
Environmental Division

BES/jh
Enclosure

cc: Mr. C. H. Stanton w/encl. (w/o Attach. 1)
Mr. L. E. Stone w/encl. (w/o Attach. 1)
Mr. W. H. Herrington w/encl. (w/o Attach. 1)
Mr. E. C. Windisch
Mr. S. M. Day
Mr. Steve Smallwood w/encl. (w/Attach. 1)

ORLANDO UTILITIES COMMISSION

RESPONSE TO COMMENT LETTER RECEIVED AUGUST 1, 1981

OF THE FLORIDA DEPARTMENT OF ENVIRONMENTAL

REGULATION, BUREAU OF AIR QUALITY MANAGEMENT

103081

COMMENT OF FDER-BAQM

1) The proposed boiler will use No. 6 fuel oil for start-up, low load operation, and flame stabilization. Please evaluate SO_2 and particulate emissions and the emission controls while burning fuel oil. What is the maximum sulfur content of the fuel oil that will be used in Unit No. 1?

OUC RESPONSE

The maximum expected sulfur content of the No. 6 fuel oil to be used for startup, low load operation and flame stabilization will be 2.5%. Based on this maximum sulfur content, the generated sulfur dioxide would be 2.73 lb $SO_2/10^6$Btu. Before startup of the unit, the flue gas scrubber will be put into service. The flue gas scrubber will reduce sulfur dioxide emissions to under 0.60 lb $SO_2/10^6$Btu.

The maximum expected ash content of the No. 6 fuel oil will be 0.5 per cent. Based on this maximum ash content, the generated particulate would be .273 lb per 10^6Btu. Because of the possibilities of fire in the precipitator during startup (high excess air and possible unburned combustibles), the precipitator will not be operated during this time. The only removal of ash will be the scrubbing of particulate from the flue gas while in the flue gas scrubber. It is expected that the flue gas scrubber will remove about 50 per cent of the fly ash resulting in an emission level of .137 lb ash/10^6Btu.

COMMENT OF FDER-BAQM

2) Please estimate fugitive coal dust emission rates for all the Sources of Emissions listed in Table 3.2-2.

3) Please estimate fugitive limestone dust emission rates for all the Sources of Emissions listed in Table 3.9-1.

OUC RESPONSE

The predicted fugitive dust impact was based on conservative assumptions for emission factors and realistic "worst case" coal and limestone handling situations. All baghouse particulate emissions were derived from the maximum design inlet loading of 13 grains per cubic foot and a collection efficiency of 99.9 per cent. The coal and limestone activities each had two emissions rates. A modeling option allowed for the use of a variable emission rate based on wind speed categories. Wind erosion was included when wind speeds exceeded 12 miles per hour. Field studies have shown that significant wind erosion may occur when the wind speed exceeds this threshold value. A basic conservative assumption in the analysis was that the fugitive dust sources were continuous emittors when in actuality the facilities would only operate part of the time.

The following assumptions were considered to be representative of a 24-hour realistic "worst case" coal and limestone handling situation. Fugitive dust emission rates were determined for this situation and then used to assess their impact.

- A coal unit train (10,000 tons) will be received and stocked out directly to the active coal pile.
- The reclaimer will load-out enough coal for Units 1 and 2 to operate at 100 per cent capacity for 24 hours (8,600 tons).
- Wind erosion estimates were for a two-unit active coal pile.
- Trucks will deliver 800 tons of limestone to the active limestone pile.
- The daily limestone reclaim is equaled to the maximum limestone consumed by both units operating at 100 per cent load.

The following are descriptions of the fugitive dust emissions associated with the sources identified in Table 3.2-2 and 3.9-1 of the Site Certification Application.

COAL HANDLING

Bottom Car Dumper. Particulate emissions are 0.56 grams per second. This is based on the maximum design inlet loading of 13 grains per cubic foot and a collection efficiency of 99.9 per cent.

Conveyor 2 and Transfer Building. Conveyor 2 is enclosed and connects with the transfer building. Any fugitive emissions from conveyor 2 would be controlled by the transfer building baghouse. The total particulate emission rate is 0.63 grams per second.

103081

Conveyor 3 and Related Active Coal Storage Activities. The fugitive dust emissions for these sources were evenly distributed over an area equivalent to a two-unit coal storage pile. This area was represented as two 70-metre square area sources. The Industrial Source Complex (ISC) model required that the emission rates for area sources be given as grams per second per square metre. The emission rates for the active coal storage sources are, respectively, 0.00011 and 0.00005 grams per second per square metre for with and without wind erosion.

Conveyor 4. This is the reserve stockout conveyor and was not included in the modeling analysis.

Emergency Stockout and Reclaim. These activities were considered to occur infrequently and thus not included in the modeling analysis.

Reserve Storage. The fugitive dust emissions associated with the reserve coal storage pile are expected to be minimal. Mitigative measures will be used to effectively seal the storage pile. The reserve pile would then only be disturbed if the coal delivery was disrupted due to a long-term mining or railroad strike. Wind erosion will be minimized because of the crusting and chemical sealing of the pile surface. The coal pile should not deteriorate once it has been sealed, thus the reserve coal storage pile was not included in the modeling analysis.

Conveyor 5. This conveyor is associated with reclaiming coal from the reserve storage pile. Emissions from the conveyor were not modeled because of the expected infrequent use.

Conveyor 6A, 6B, and Crusher Building. The conveyors are enclosed and exhaust into the crusher building. The crusher building will be enclosed and utilize a baghouse for particulate control. The total emission rate was assumed to be 0.21 grams per second.

Conveyor 7A, 7B, Surge Tower and Plant Silo. The conveyors exhaust into the Surge Tower and Plant Silo. The particulate emissions were modeled as being emitted from a single point at a rate of 0.28 grams per second.

LIMESTONE HANDLING

The limestone handling equipment have been designed to handle delivery of limestone by railcar and truck. It was assumed that there would be more fugitive dust emissions associated with truck delivery. The limestone fugitive dust emissions were also assumed to be uniformly distributed over a 100-metre square area.

Bottom Car Dumper and Stockout Conveyor. The car dumper and conveyor were not modeled since limestone was assumed to be delivered by truck directly to the storage pile.

Active Storage Activities. The fugitive dust emissions from these activities were uniformly distributed over a 100-metre square area source. As with the coal pile storage, wind erosion was included only when the wind speed exceeded 12 miles per hour. The total emission rate for all limestone emissions with and without wind erosion is 0.00006 and 0.00003 grams per second per square metre.

Reserve Storage and Reclaim Conveyor. All limestone was assumed to be loaded in and out from only the active storage pile. Wind erosion from the reserve storage was included in the total emission rate for the 100-metre square area source.

Storage Day Bin. The limestone was assumed to be transported into the pollution control equipment and thus the emissions were expected to be very minor.

COMMENT OF FDER-BAQM

4) What is the maximum quantity of gas bypassing the FGD system?

OUC RESPONSE

The unit will be provided with a full flow flue gas bypass for emergency operation. The maximum quantity of gas which could be used for flue gas reheat by bypassing the FGD system is approximately 25 per cent. This would occur only when emissions are less than 0.6 pounds $SO_2/10^6$Btu heat input.

COMMENT OF FDER-BAQM

5) Please address carbon monoxide and flouride emissions from each unit. A BACT analysis is required for CO emissions. A material balance on flouride is requested. If emissions exceed the significant level, a BACT will be required for this pollutant.

OUC RESPONSE

Production of carbon monoxide is detrimental to plant efficiency. Boiler design and unit operations have always been geared toward obtaining complete combustion. Therefore modern boiler design is the Best Available Control Technology for minimizing CO emissions.

An attempt to provide a fluoride material balance has been made. However only a limited amount of mass balance data for fluorides at power plants have been reported. From these data several observations can be made.

(1) The amount of fluoride in the coal varies substantially from coal to coal.

(2) The percentage of fluoride which is subject to atmospheric release (that is volatized rather than adsorbed onto and collected with the fly ash) ranges from 8 per cent to 84 per cent in the published literature.

(3) Wet scrubbing of flue gas is very effective in removing volatized fluoride.

Mass balances were attempted using a variety of coals and assumptions. These calculations yielded potential fluroide emission estimates ranging from 1.8 to 40 tons per year depending on the particular assumptions used. Therefore OUC is unable to determine, in advance, whether the unit will have the potential to emit more than the three tons per year significance level.

Even at an emission rate of 40 tons per year, the maximum 24 hour average ground level concentration is well below threshold limits for vegetation damage to even the most sensitive vegetation species.

No control technologies for the removal of fluorides have been developed. OUC believes that the Best Available Control Technology for this plant is no controls since no benefits from fluoride emission reductions could be realized.

COMMENT OF FDER-BAQM

6) For information only, please provide and summary of the NO, NO_x, and IP onsite measurements which you consider valid and representative.

TABLE 1. SUMMARY OF NO AND NO_x DATA

First (1) and second (2) highest one hour average concentrations in micrograms per cubic metre referenced to STP (25 C, 760 mmHg). Monthly and annual arithmetic average (Avg) concentrations.

Month		NO	NO_x
May 1980	(1)	10.7	49.6
	(2)	6.4	31.7
	Avg	6.0	8.0
June 1980	(1)	8.0	23.7
	(2)	7.1	10.2
	Avg	6.0	8.0
July 1980	(1)	6.2	33.2
	(2)	6.2	15.0
	Avg	6.0	10.0
August 1980	(1)	14.9	34.0
	(2)	14.9	32.0
	Avg	6.0	15.0
September 1980	(1)	45.1	55.0
	(2)	28.2	32.0
	Avg	6.0	15.0
October 1980	(1)	21.9	113.0
	(2)	21.8	80.0
	Avg	6.0	17.0
November 1980	(1)	15.7	59.4
	(2)	14.4	49.0
	Avg	6.0	12.0
December 1980	(1)	26.5	91.0
	(2)	20.1	82.6
	Avg	7.0	14.0
January 1981	(1)	30.5	89.3
	(2)	28.4	84.2
	Avg	7.0	13.0
February 1981	(1)	16.6	77.7
	(2)	11.4	77.0
	Avg	6.0	14.0
March 1981	(1)	12.1	83.8
	(2)	11.3	70.7
	Avg	6.0	11.0
April 1981	(1)	6.5	32.2
	(2)	6.4	31.5
	Avg	6.0	8.0
Annual	(1)	45.1	113.0
	(2)	30.5	91.0
	Avg	6.2	12.1

TABLE 2. SUMMARY OF INHALABLE PARTICULATE MATTER DATA

First (1) and second (2) highest 24-hour average concentrations in micrograms per cubic metre of the coarse (2.5 to 15 micrometer) and fine (less than 2.5 micrometer) particulate matter size ranges. Also, the fine particulate values corresponding to the two highest coarse values and the coarse values corresponding to the two highest fine values. Monthly and annual arithmetic average concentrations (Avg) of coarse and fine measurements.

Month		Coarse With Corresponding Fine	Fine With Corresponding Coarse
		May through October - No Data	
November 1980	(1)	29.8, 72.6	72.6, 29.8
	(2)	19.4, 10.2	16.7, 17.7
	Avg	14.9	22.1
December 1980	(1)	11.3, 7.4	11.1, 3.9
	(2)	3.9, 11.1	7.4, 11.3
	Avg	Missing[1]	Missing[1]
January 1981	(1)	11.3, 29.1	33.8, 7.9
	(2)	10.5, 32.8	32.8, 10.5
	Avg	9.0	28.5
February 1981	(1)	16.0, 39.8	58.3, 1.3
	(2)	11.6, 13.0	39.8, 16.0
	Avg	8.0	28.5
March 1981	(1)	76.2, 16.6	28.9, 19.0
	(2)	43.9, 22.3	22.3, 43.9
	Avg	38.2	21.6
April 1981	(1)	24.8, 18.5	25.0, 21.7
	(2)	21.7, 25.0	19.4, 12.6
	Avg	17.0	18.0
November 1980-April 1981	(1)	76.2, 16.6	58.3, 1.3
	(2)	43.9, 22.3	33.8, 7.9
	Avg	17.4	23.7

[1] Insufficient data to compute average.

OUC RESPONSE

The information in Tables 1 and 2 provide the requested data. Complete data tabulations have been sent already to BAQM. The first three-quarters of the monitoring year were sent on March 2, 1981[1] and the last quarter was sent on May 29, 1981.[2]

Table 1 is a summary of the NO (nitric oxide) and NO_X (nitric oxide plus nitrogen dioxide) data for the 12 month monitoring period, May 1980 through April 1981. The two highest one-hour averages and the average concentrations are given for each month and the annual periods. All values are in micrograms per cubic metre, referenced to 25 C and 760 mm Hg temperature and pressure. Some of the apparent variation in monthly NO_X averages is due to differences in data processing methods for data taken from magnetic tape versus data manually taken from onsite teletype or strip chart records.

Table 2 is a summary of the IP (inhalable particulate) matter data based on the dichotomous sampler measurements. The two highest coarse and fine 24-hour average concentrations are given along with the averages for the monthly and annual periods. In addition, the fine particulate concentration corresponding to each of the two highest coarse values and the coarse particulate concentration corresponding to the two highest fine values are also shown in Table 2.

COMMENT OF FDER-BAQM

7) Please provide precise (±10 m) UTM coordinates of each emission point, if known at this time, or approximate (±50 m) UTM coordinates of one point and relative (x,y) coordinates of the others.

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(1) Letter from S. M. Day of B&V to W. J. Blommel, Environmental Administrator, Florida Department of Environmental Regulations, Bureau of Air Quality Management, dated March 2, 1981.

(2) Letter from S. M. Day of B&V to W. J. Blommel, Environmental Administrator, Florida Department of Environmental Regulations, Bureau of Air Quality Management, dated May 29, 1981.

OUC RESPONSE

For the air quality modeling analysis, the unloading facility was arbitrarily selected as the coordinate reference point. The approximate UTM Coordinates for the train unloading facility are 3,1500,000 N; 483,250 E. Table 3 presents the relative coordinates for the modeled sources with respect to the train unloading facility location.

TABLE 3. MODELING COORDINATES

Emission Source	Relative Coordinates	
	x m	y m
Train Unloading Facility	10000.	10000.
Transfer Building	9985.	10480.
Crusher Building	10105.	10480.
Coal Silo	10490.	10480.
Unit 1 Stack	10340.	10450.
Unit 2 Stack	10340.	10510.
Coal Storage Pile	9725.	10450.
Coal Storage Pile	9795.	10450.
Limestone Storage Pile	10210.	10195.

COMMENT OF FDER-BAQM

8) Please provide copies of all final model runs (CRSTER and ISC output) showing input data, receptor locations, and principle output tables for the two unit case.

OUC RESPONSE

Attachment 1 contains copies of the CRSTER and ISC modeling runs that were used to support the two-unit air quality analysis. An index to this attachment (A through N) follows.

INDEX FOR ATTACHMENT 1

A. 1974 CRSTER dispersion modeling for receptor rings 0.5 to 5.0 km by 0.5 km.

B. 1974 CRSTER dispersion modeling for receptor rings 1.1 to 2.0 km by 0.1 km.

C. 1975 CRSTER dispersion modeling for receptor rings 0.5 to 5.0 km by 0.5 km.

D. 1975 CRSTER dispersion modeling for receptor rings 0.6 to 2.5 km by 0.1 km.

E. 1976 CRSTER dispersion modeling for receptor rings 0.5 to 5.0 km by 0.5 km.

F. 1976 CRSTER dispersion modeling for receptor rings 1.1 to 2.0 km by 0.1 km.

G. 1976 CRSTER dispersion modeling for receptor rings 0.6 to 1.0 km by 0.1 km.

H. 1977 CRSTER dispersion modeling for receptor rings 0.5 to 5.0 km by 0.5 km.

I. 1977 CRSTER dispersion modeling for receptor rings 0.6 to 1.5 km by 0.1 km.

J. 1977 CRSTER dispersion modeling for receptor rings 1.6 to 3.0 km by 0.1 km.

K. 1978 CRSTER dispersion modeling for receptor rings 0.5 to 5.0 km by 0.5 km and 31 to 40 km by 1.0 km.

L. 1978 CRSTER dispersion modeling for receptor rings 0.6 to 1.5 km by 0.1 km.

M. 1974 (All Days) ISC dispersion modeling for assessment of the fugitive dust impact.

N. 1974 (Day 69) ISC dispersion modeling for determination of individual source contribution to maximum 24-hour concentration.

COMMENT OF FDER-BAQM

9) For purposes of the federal PSD permit, please provide an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial, and other growth associated with the plant. (secondary growth)

OUC RESPONSE

The Stanton Energy Center Unit 1 has been certified for operation in 1986 by the Florida Public Service Commission because of economics of power production; not generating capacity needs related to growth. Additional generating capacity would be required by 1991 to meet increased demands related to growth. From 1986-1991 Unit 1 will offset older oil-fired generating units which do not have modern air pollution control equipment. Therefore, during this period, secondary air quality impacts would primarily consist of a reduction of total SO_2 and TSP emissions.

If it is assumed that the Stanton Energy Center Unit 1 will offset the oil-fired Indian River facilities, the amount of reduction in air pollution emissions per million Btu heat input would be 83 per cent for SO_2 and 70 per cent for particulates.

Future needs for electrical energy have been projected for the OUC service area for the period beyond 1991. Projections of growth for populations and for economic activity were based on historical trends in growth rates and in the types of growth. Induced growth attributable to Stanton Energy Center Unit 1 was not considered. The proposed facility is intended to supply power to meet projected demands which will result from normal economic growth in the service area and is not expected to stimulate additional amounts of growth or to shift the nature of expected growth. Therefore, for the life of the unit beyond 1991, no significant secondary air pollution impacts are expected.