Florida Department of
Environmental Protection

Memorandum

TO: Howard L. Rhodes

THROUGH: Clair Fancy

FROM: A. A. Linero 9/18

DATE: September 18, 1995

SUBJECT: Approval of Permit
Seminole/Hardee Unit 3

Attached for your approval is an air construction permit and BACT determination for Hardee Unit 3 to be built by Seminole Electric Cooperative Inc. (SECI).

The project is for a combined cycle unit consisting of two 150 MW combustion turbines and a 140 MW heat recovery steam generator.

Emissions controls include firing natural gas with very low sulfur fuel oil as backup. Other controls include dry low-NOx to limit NOx concentrations to 15 ppm under gas operation and steam injection to limit NOx concentrations to 42 ppm while firing fuel oil.

The Site Certification with these same conditions was already approved by the Governor. There are no outstanding issues.

AAL/sa/t

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OF COUNSEL
CARLOS ALVAREZ
W. ROBERT FOKES

March 30, 1995

BY HAND DELIVERY

RECEIVED
MAR 30 1995
Bureau of
Air Regulation

Kenneth Plante, Esquire
Office of General Counsel
Department of Environmental Protection
2600 Blair Stone Road, Room 654
Tallahassee, FL 32399-2400

Re: Seminole Electric Cooperative, Inc.
Hardee Unit 3
PSD Permit No. PSD-FL-214
Hardee County

Dear Mr. Plante:

Seminole Electric Cooperative, Inc. ("Seminole") received the Department's notice of intent to issue the above-referenced Prevention of Significant Deterioration ("PSD") permit for the construction of a nominal 440 MW combined cycle unit at the Hardee Power Station Site. The notice of intent to issue was received by Seminole on February 24, 1995. On March 7, 1995, Seminole, through undersigned counsel, requested an extension of time in which to file a petition for administrative hearing on the proposed PSD permit, pursuant to Rule 62-103.070, F.A.C. The Department has not yet entered an order granting that extension request. In its previous request, Seminole requested an extension until April 3, 1995, to file a petition for an administrative hearing regarding the permit.

On behalf of Seminole, I hereby request, pursuant to Rule 62-103.070, Florida Administrative Code, an additional extension to and including April 12, 1995, in which to file a petition for administrative proceedings regarding the permit. As good cause for granting the request for extension of time for filing, Seminole states the following:

1. The proposed permit and attached Technical Evaluation and Preliminary Determination contain numerous Specific Conditions and other matters, several of which appear to warrant clarification or correction.

2. Over the last several months, Seminole has conferred and corresponded with the appropriate representatives of the Department regarding this permit and these conditions. Most of the issues have been resolved in concept, but several conditions remain of concern for Seminole. Seminole will continue to work with the Department in an attempt to reach final resolution of this matter.

3. This request is filed simply as a protective measure to avoid waiver of Seminole's right to challenge the proposed permit. Grant of this request will not prejudice either party, but will further their mutual interest and likely avoid the need to initiate formal administrative proceedings.

4. I hereby certify that I have consulted with Charles Collette of the Department's Office of General Counsel about this request. He indicated he did not anticipate any Department objections to this request.

Accordingly, I hereby request that you formally extend the time for filing of a petition for administrative proceedings in regards to Department PSD Permit No. PSD-FL-214 to and including April 12, 1995.

Sincerely,

Douglas S. Roberts

DSR/gs

cc: Clair Fancy, DEP, Bureau of Air Regulation
Douglas Beason. Esq., DEP OGC
Richard T. Donelan, Esq., DEP OGC
Charles T. Collette, Esq., DEP OGC
Steve Palmer, DEP Siting Coordination

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OF COUNSEL
CARLOS ALVAREZ
W. ROBERT FOKES

RECEIVED
MAR 30 1995
Bureau of
Air Regulation

March 29, 1995

Al Linero
Bureau of Air Regulation
Department of Environmental Protection
Magnolia Courtyard
Tallahassee, FL 32399

RE: Seminole Electric Cooperative
PSD Permit PSD-FL-214

Dear Mr. Linero:

I wish to supplement my letter of March 24, 1995, commenting on the above draft PSD permit with one minor change to the air emissions table in the permit. That change is reflected in the attached table for page 6 of 13 from the permit. It changes the permitted tons per year for gas firing from 44 TPY to 47 TPY, due to the change in the CT combustor to remove the need for steam augmentation.

Please incorporate this additional comment along with the other contained in the earlier letter. Should you have any questions concerning this, please contact me.

Sincerely,

Douglas S. Roberts

cc: Said Arif
Steve Palmer
Ken Bachor

PERMITTEE:
Seminole Electric Cooperative Inc.
Expiration Date: January 1, 2000

Permit Number: PSD-FL-214
(PA-89-25SA)

SPECIFIC CONDITIONS:

B. Emission Limits

1. Pursuant to Rule 62-212.410, F.A.C., BACT, the maximum allowable emission limitations from two CTs, when firing natural gas or No. 2 fuel oil, shall not exceed the following:

MAXIMUM ALLOWABLE EMISSION LIMITATIONS

POLLUTANT	FUEL	CONCENTRATION	lbs/hr(a)	TPY(b)	TPY(TOTAL)c
NO_x	Gas	15 ppmvd(d)	~~104~~ 106	~~911~~ ~~930~~ 938	~~1139~~ 1212
	Oil	42 ppmvd(e)	~~350~~ 336	~~525~~ 504	
CO	Gas	20 ppmvd	71	622	~~614~~ 618
	Oil	25 ppmvd	91	136	
PM/PM_{10}	Gas		7	~~61~~ 65	~~145~~ 147
	Oil		67	100	
SO_2	Gas		5	~~44~~ 47	~~175~~ 182
	Oil		~~100~~ 101	~~150~~ 152	
VOC	Gas	5 ppmvd	10	88	99
	Oil	10 ppmvd	21	31	
Sulfuric Acid Mist	Gas		1	~~9~~ 6	~~38~~ 39
	Oil		22	~~33~~ 34	
Beryllium	Oil		0.0049	0.007	0.007
Arsenic	Oil		0.0097	0.014	0.014
Visible Emissions	Gas		≤ 10 percent opacity		
	Oil		≤ 10 percent opacity		

(a) The emission limitations in lbs/hr/CT are a ~~1~~-hour average. as determined pursuant to the Performance Testing conducted pursuant to Specific Condition C. below

(b) The annual emission limitations (TPY) for natural gas are based on two CTs operating at full load for 8,760 hours per year. The annual emission limitations (TPY) for fuel oil are based on the equivalent of full-load operation for a maximum of 1500 hours per year for each of the two CTs (not to exceed 3,000 hrs/yr between the two CTs). The emission calculations are also based at a worst case ambient temperature of 32°F.

(c) Maximum allowable emissions from two CTs if any fuel oil is burned at the facility during the year. The emission calculations are also based at an ambient temperature of 59°F.

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OF COUNSEL
CARLOS ALVAREZ
W. ROBERT FOKES

March 24, 1995

RECEIVED
MAR 24 1995
Bureau of
Air Regulation

Mr. Al Linero
Bureau of Air Regulation
Department of Environmental Protection
Magnolia Courtyard
Tallahassee, FL 32399

RE: Seminole Electric Cooperative, Inc.;
Hardee Unit 3;
Comments on Proposed PSD Permit PSD-FL-214

Dear Mr. Linero:

On behalf of Seminole Electric Cooperative, Inc. (Seminole), I wish to offer the following comments on the Department's proposed prevention of significant deterioration (PSD) permit and the supporting preliminary BACT determination for Seminole's Hardee Unit 3 Project. These written comments supplement the oral and preliminary comments Seminole provided at our meeting on March 7, 1995. Attached to this letter is a marked-up copy of the proposed PSD permit and the preliminary determination with suggested changes. Several of these proposed changes are discussed below.

Steam Augmentation

As we explained in the recent meeting, Westinghouse is developing a dry low NOx combustor that will allow each CT to maintain its minimum output of 150 MW (and the entire unit to achieve 440 MW) during all ambient conditions without the use of steam augmentation. Therefore, Seminole no longer requests a different emission rate for NOx and other emissions for that condition. However, to accommodate the minimum power output throughout the range of ambient conditions, the combustor requires the use of more fuel, thus increasing the heat input rate for the CTs and the emissions of several pollutants. This increased heat input is reflected on the attached markup. The heat input for natural gas changes from 1,799 MMBtu/hr to 1,862 MMBtu/hr and for oil firing, from 1,972 MMBtu/hr to 1,965 MMBtu/hr.

This change in gas turbine design maintains the proposed emission concentrations (in PPM, i.e., 15 PPM for NOx) in the proposed PSD permit, but because of the increased heat input, the emissions of several pollutants in pounds per hour and tons per year increase marginally. These emissions changes are also reflected in the enclosed revised emissions table under Specific Condition B.1., on page 6 of 13 of the proposed permit. Even with this minor increase in total emissions, Seminole's analysis indicates that the outcome of the air quality impact analysis will not significantly change and that all air quality standards will be maintained, and no PSD increments will be exceeded.

Fuel Bound Nitrogen

While Westinghouse has been able to eliminate the need for steam augmentation for the selected CTs, these combustion turbines will only be able to meet the proposed maximum nitrogen oxide emission rate of 42 ppm with a fuel oil containing up to 0.015% nitrogen. For fuel oil containing a greater level of nitrogen, Westinghouse and Seminole continue to request that an allowance for fuel bound nitrogen (FBN) be granted of up to an additional 12 ppm based upon a fuel with a maximum fuel bound nitrogen level of 0.03%. As previously explained to the Department, both orally and through a February 9, 1995 letter from Seminole to Bruce Mitchell, the new dry low NOx combustors are optimized to control nitrogen oxide formation while firing natural gas, the primary fuel, limiting control techniques for NOx formation during oil firing. This dual fuel combustor design makes it impossible for Westinghouse to achieve a thermal NOx level low enough that can accommodate a FBN of 12 ppm while staying within the proposed 42 ppm concentration during oil firing, regardless of fuel nitrogen content.

Like most recent CT projects with DLN combustors and dual fuel capability, the Hardee Unit 3 is being permitted before the combustor design is finalized, constructed and tested. Thus, the Department's permitting levels are well in advance of currently demonstrated technology. It may well be that when placed in operation in 1999, the Westinghouse DLN combustor will be able to achieve a NOx emission rate for all levels of FBN lower than the requested 54 ppm maximum. Also, by 1999, fuel oil with a maximum FBN content of 0.015% may be readily available without an unnecessary extra cost burden to Seminole's consumers. But at this time, those assurances cannot be given by Westinghouse or the fuel suppliers. Without the requested FBN allowance of up to 12 ppm, based upon measured FBN levels, Seminole will be forced to forego oil firing in order to assure compliance with the permit limits or be forced to pay a premium for guaranteed FBN levels of 0.015% from the fuel oil suppliers. However, Seminole's analysis, based upon

surveys of fuel oil suppliers, indicates that such a premium is not BACT when considering the required BACT factors.

The Department's proposed conditions allow the Department to seek to revise the permitted NOx emission rates and levels based upon actual levels achieved during initial operation of the new unit. Seminole is willing to accept that condition. However, Seminole restates its request for a FBN allowance of up to 12 ppm for fuel oil with a maximum FBN of 0.03%.

Other Permit Provisions

Most of the other comments are reflected in the handwritten comments on the attached permit package which the Department issued. Several items warrant particular discussion as follows.

The identified changes in emission rates and levels throughout these marked-up documents are due to the change in the fuel usage and heat input rate as explained above.

At page 6 of 13 of the proposed PSD permit, footnote A to Specific Condition B.1. has been revised to reflect that the 1-hour averaging time for emissions is applied during required compliance testing.

At page 8 of 13, in Specific Condition 6., Seminole requests that approved periods of excess emissions include periods of switching between fuels (natural gas and fuel oil). Experience with CTs suggests that there can be short spikes in emissions when switching fuels and engaging different emission control systems, such as water injection to control NOx. If periods of excess emissions for fuel switching are not authorized, the alternative would be to shutdown the CT and restart it on the second fuel, which would result in even greater total emissions during that shutdown and startup process. Thus, from an emissions standpoint, the requested authorization would result in lower emissions. The Department's excess emissions rules, 62-210.700(5), FAC, authorize the Department to approve periods of excess emissions in such a circumstance based upon "operational variations in types of industrial equipment operations. . .to provide reasonable and practical regulatory controls consistent with the public interest."

At page 9 of 13 in the permit, Seminole proposes revising Specific Condition C.1.i. to allow submittal of natural gas vendor data as a custom fuel sampling procedure for monitoring the sulfur content of natural gas and fuel oil. We understand USEPA must approve such a procedure, but recognizing it in the permit as a possibility would avoid any future need for a permit modification.

At page 9 of 13 in the permit, Seminole proposes revising Specific Condition C.1.j. to allow the use of other EPA approved test methods for compliance tests on CTs without having to seek approval as an alternate test method or a permit modification.

We appreciate the opportunity to provide these comments. Should you or your staff have any questions concerning these comments, please do not hesitate to contact either Ken Bachor at Seminole at 813/963-0994 or me. Following your review of these comments, we also request a meeting with your staff and Clair Fancy to discuss any and all outstanding issues in an effort to resolve these issues prior to the scheduled certification hearing on April 17th. I will call you to set up this meeting.

Sincerely,

Douglas S. Roberts

Encls.

cc: Said Arif, BAR
Steve Palmer, Siting Coord.
Richard Donelan, OGC

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March 23, 1995

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Bureau of
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Said Arif
Bureau of Air Regulation
Department of Environmental Protection
Magnolia Courtyard
Tallahassee, FL 32399

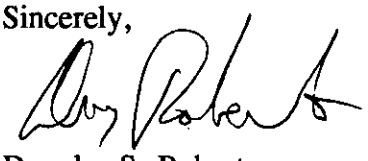
Re: Seminole Electric Cooperative
Hardee Unit 3

Dear Said:

Pursuant to your request, attached is a letter from Westinghouse Electric Corp. transmitting the revised air emission for the Hardee Unit 3 project. These tables are for both natural gas firing and oil firing at the increased heat input levels.

Should you have any questions concerning this matter, please call me.

Sincerely,



Douglas S. Roberts

DSR/gs
Encls.

cc: Ken Bachor

Westinghouse Electric Corporation
Power Generation Business Unit

Generation Systems Divisions
The Quadrangle
4400 Alafaya Trail
Orlando Florida 32826-2399

24 January, 1995

CTW-SEM-95-0018

Seminole Electric Cooperative Inc.
16313 North Dale Mabry Highway
Tampa, FL 33618
ATTENTION: MR. JOE WELBORN

SUBJECT: Seminole Electric Cooperative, Inc.
Hardee power Station Unit 3
EMISSIONS

Dear Mr. Welborn:

Attached please find the expected emissions performance for the uprated 501FC combustion turbine for the Hardee Power Station Unit 3. Please note, with the increased output of the 501FC combustion turbine, steam injection for power augmentation will no longer be required to meet the Hardee Power Station's required 440 megawatt output.

Please call if you have any questions.

Regards,

Tom

Tom O'Hanlon
Project Manager
Seminole - Hardee #3 Project

cc: K. Trout, B&V

Seminole Electric Cooperative – Hardee Power Station Unit 3
Emissions and Stack Exit Parameters – 501FC
Natural Gas Fuel, 15 ppm NOx without SCR

				HRSG	BYPASS
Fuel:	Natural Gas		Stack Dia.:	19	23
HHV:	23,170	Btu/lb	Stack Ht:	90	75
Sulfur:	1.0	grains/100 scf			
Fuel Density:	0.0486	lb/scf			

Parameters:	Base Load					75% CT Load				50% CT Load			
Ambient Temperature (deg F)	95	80	72	59	32	95	72	59	32	95	72	59	32
Relative Humidity (%)	80	80	80	60	30	80	80	60	30	80	80	60	30
Barometric Pressure (PSIA)	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630
Load Condition (% CT Load)	100	100	100	100	100	75	75	75	75	50	50	50	50
CT Megawatts (Net)	145.7	151.0	157.6	166.5	177.8	109.1	118.1	124.8	133.4	72.3	78.4	82.8	88.6
Heat Input (million Btu/hr, HHV)	1,611	1,650	1,703	1,770	1,862	1,296	1,367	1,421	1,491	971	1,016	1,053	1,096
Heat Input (million Btu/hr, LHV)	1,453	1,488	1,536	1,596	1,679	1,169	1,233	1,281	1,344	876	916	950	988
Estimated CT Heat Rate (Btu/kwh, LHV)	9,973	9,852	9,743	9,589	9,441	10,713	10,438	10,271	10,082	12,103	11,690	11,463	11,156
Fuel Flow (lb/hour)	69,530	71,213	73,500	76,392	80,363	55,934	58,999	61,329	64,350	41,908	43,850	45,447	47,303
Evaporative Cooler On?	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No
Steam Augmentation Flow (lb/hour)	0	0	0	0	0	0	0	0	0	0	0	0	0
Exhaust Flow (lb/hour)	3,229,880	3,331,400	3,425,220	3,552,690	3,714,120	2,696,350	2,793,470	2,868,360	2,938,440	2,395,940	2,496,130	2,551,930	2,656,260
CT Exhaust Temperature (deg F)	1158	1145	1137	1125	1112	1160	1160	1160	1160	1063	1049	1048	1022
HRSG Exhaust Temperature (deg F)	190	190	190	190	190	190	190	190	190	190	190	190	190
Exhaust Moisture (%)	11.52	9.72	9.26	8.33	7.37	11.04	8.96	8	7.38	10.07	7.88	6.9	6.11
Exhaust O2 (%, wet)	12	12.38	12.44	12.59	12.72	12.39	12.66	12.76	12.71	13.52	13.9	14.02	14.17
Exhaust O2 (% dry)	13.56	13.71	13.71	13.73	13.73	13.93	13.91	13.87	13.72	15.03	15.09	15.06	15.09
Exhaust Mol. Wt.	28.0	28.2	28.3	28.4	28.5	28.1	28.3	28.4	28.5	28.1	28.4	28.5	28.6
HRSG Stack Exhaust Flow (ACFM)	915,100	937,259	961,856	994,004	1,035,248	762,883	783,774	801,650	819,081	676,505	698,720	711,562	738,408
Bypass Stack Exhaust Flow (ACFM)	2,277,895	2,314,308	2,363,206	2,423,842	2,503,707	1,901,340	1,953,407	1,997,958	2,041,401	1,585,103	1,622,106	1,650,824	1,683,571
Exhaust Flow (DSCFM)	643,347	672,330	693,490	724,014	761,952	539,243	566,963	586,009	602,786	483,400	511,433	526,373	550,868
Bypass Stack Exit Velocity (ft/sec)	91.4	92.8	94.8	97.2	100.4	76.3	78.4	80.1	81.9	63.6	65.1	66.2	67.5
CC Stack Exit Velocity (ft/sec)	53.8	55.1	56.5	58.4	60.9	44.8	46.1	47.1	48.1	39.8	41.1	41.8	43.4
NOx (ppmvd at 15 % O2)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
NOx (ppmvd)	18.7	18.3	18.3	18.2	18.2	17.7	17.8	17.9	18.2	14.9	14.8	14.8	14.8
NOx (lb/hour)	89.9	92.0	95.0	98.8	104.0	71.6	75.5	78.5	82.4	54.0	56.6	58.6	60.9
NOx (lb/million Btu, HHV)	0.056	0.056	0.056	0.056	0.056	0.055	0.055	0.055	0.055	0.056	0.056	0.056	0.056
CO (ppmvd at 15 % O2)	8.0	8.2	8.2	8.2	8.2	16.9	16.9	16.8	16.4	30.2	30.5	30.3	30.5
CO (ppmvd)	10	10	10	10	10	20	20	20	20	30	30	30	30
CO (lb/hour)	29.3	30.7	31.6	33.0	34.7	49.2	51.7	53.4	55.0	66.1	70.0	72.0	75.4
CO (lb/million Btu, HHV)	0.018	0.019	0.019	0.019	0.019	0.038	0.038	0.038	0.037	0.068	0.069	0.068	0.069
SO2 (ppmvd at 15 % O2)	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
SO2 (ppmvd)	0.64	0.63	0.63	0.63	0.63	0.62	0.62	0.62	0.64	0.52	0.51	0.51	0.51
SO2 (lb/hour)	4.2	4.3	4.4	4.6	4.9	3.4	3.6	3.7	3.9	2.5	2.7	2.7	2.9
SO2 (lb/million Btu, HHV)	0.0026	0.0026	0.0026	0.0026	0.0026	0.0026	0.0026	0.0026	0.0026	0.0026	0.0026	0.0026	0.0026
Total HC's (ppmvd at 15 % O2)	4.0	4.1	4.1	4.1	4.1	4.2	4.2	4.2	4.1	30.2	30.5	30.3	30.5
Total HC's (ppmvd)	5	5	5	5	5	5	5	5	5	30	30	30	30
Total HC's (lb/hour)	8.4	8.8	9.0	9.4	9.9	7.0	7.4	7.6	7.9	37.8	40.0	41.1	43.1
Total HC's (lb/million Btu, HHV)	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.039	0.039	0.039	0.039

Seminole Electric Cooperative -- Hardee Power Station Unit 3
Emissions and Stack Exit Parameters -- 501FC
Natural Gas Fuel, 15 ppm NOx without SCR

				HRSG	BYPASS
Fuel:	Natural Gas		Stack Dia.:	19	23
HHV:	23,170	Btu/lb	Stack Ht:	90	75
Sulfur:	1.0	grains/100 scf			
Fuel Density:	0.0486	lb/scf			

Parameters:	Base Load					75% CT Load				50% CT Load			
Ambient Temperature (deg F)	95	80	72	59	32	95	72	59	32	95	72	59	32
Relative Humidity (%)	80	80	80	60	30	80	80	60	30	80	80	60	30
Barometric Pressure (PSIA)	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630	14.630
Load Condition (% CT Load)	100	100	100	100	100	75	75	75	75	50	50	50	50
CT Megawatts (Net)	145.7	151.0	157.6	166.5	177.8	109.1	118.1	124.8	133.4	72.3	78.4	82.8	88.6
Heat Input (million Btu/hr, HHV)	1,611	1,650	1,703	1,770	1,862	1,296	1,367	1,421	1,491	971	1,016	1,053	1,096
Heat Input (million Btu/hr, LHV)	1,453	1,488	1,536	1,596	1,679	1,169	1,233	1,281	1,344	876	916	950	988
Estimated CT Heat Rate (Btu/kwh, LHV)	9,973	9,852	9,743	9,589	9,441	10,713	10,438	10,271	10,082	12,103	11,690	11,463	11,156
Fuel Flow (lb/hour)	69,530	71,213	73,500	76,392	80,363	55,934	58,999	61,329	64,350	41,908	43,850	45,447	47,303
Evaporitive Cooler On?	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No
Steam Augmentation Flow (lb/hour)	0	0	0	0	0	0	0	0	0	0	0	0	0
Exhaust Flow (lb/hour)	3,229,880	3,331,400	3,425,220	3,552,690	3,714,120	2,696,350	2,793,470	2,868,360	2,938,440	2,395,940	2,496,130	2,551,930	2,656,260
CT Exhaust Temperature (deg F)	1158	1145	1137	1125	1112	1160	1160	1160	1160	1063	1049	1048	1022
HRSG Exhaust Temperature (deg F)	190	190	190	190	190	190	190	190	190	190	190	190	190
Exhaust Moisture (%)	11.52	9.72	9.26	8.33	7.37	11.04	8.96	8	7.38	10.07	7.88	6.9	6.11
Exhaust O2 (%, wet)	12	12.38	12.44	12.59	12.72	12.39	12.66	12.76	12.71	13.52	13.9	14.02	14.17
Exhaust O2 (% dry)	13.56	13.71	13.71	13.73	13.73	13.93	13.91	13.87	13.72	15.03	15.09	15.06	15.09
Exhaust Mol. Wt.	28.0	28.2	28.3	28.4	28.5	28.1	28.3	28.4	28.5	28.1	28.4	28.5	28.6
HRSG Stack Exhaust Flow (ACFM)	915,100	937,259	961,856	994,004	1,035,248	762,883	783,774	801,650	819,081	676,505	698,720	711,562	738,408
Bypass Stack Exhaust Flow (ACFM)	2,277,895	2,314,308	2,363,206	2,423,842	2,503,707	1,901,340	1,953,407	1,997,958	2,041,401	1,585,103	1,622,106	1,650,824	1,683,571
Exhaust Flow (DSCFM)	643,347	672,330	693,490	724,014	761,952	539,243	566,963	586,009	602,786	483,400	511,433	526,373	550,868
Bypass Stack Exit Velocity (ft/sec)	91.4	92.8	94.8	97.2	100.4	76.3	78.4	80.1	81.9	63.6	65.1	66.2	67.5
CC Stack Exit Velocity (ft/sec)	53.8	55.1	56.5	58.4	60.9	44.8	46.1	47.1	48.1	39.8	41.1	41.8	43.4
VOC's (ppmvd at 15 % O2)	3.2	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.3	10.1	10.2	10.1	10.2
VOC's (ppmvd)	4	4	4	4	4	4	4	4	4	10	10	10	10
VOC's (lb/hour)	6.7	7.0	7.2	7.5	7.9	5.6	5.9	6.1	6.3	12.6	13.3	13.7	14.4
VOC (lb/million Btu, HHV)	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.013	0.013	0.013	0.013
Particulates, excludes H2SO4													
TSP & PM-10 (lb/hour)	5.6	5.8	5.9	6.1	6.4	5.0	5.2	5.3	5.4	4.4	4.6	4.7	4.8
TSP & PM-10 (lb/million Btu, HHV)	0.0035	0.0035	0.0035	0.0034	0.0034	0.0039	0.0038	0.0037	0.0036	0.0045	0.0045	0.0045	0.0044
Particulates, includes H2SO4													
TSP & PM-10 (lb/hour)	7.2	7.4	7.6	7.8	8.2	6.3	6.5	6.7	6.9	5.3	5.6	5.7	5.9
TSP & PM-10 (lb/million Btu, HHV)	0.0045	0.0045	0.0044	0.0044	0.0044	0.0048	0.0048	0.0047	0.0046	0.0055	0.0055	0.0054	0.0054
H2SO4 Mist (lb/hour)	1.57	1.61	1.66	1.72	1.81	1.26	1.33	1.38	1.45	0.95	0.99	1.03	1.07
H2SO4 Mist (lb/million Btu)	0.00097	0.00097	0.00097	0.00097	0.00097	0.00097	0.00097	0.00097	0.00097	0.00097	0.00097	0.00097	0.00097
CO2 (lb/hour)	196,935	201,703	208,092	216,745	228,096	156,793	165,549	172,063	180,468	118,627	124,512	128,826	134,106
CO2 (lb/million Btu, HHV)	122.2	122.2	122.2	122.5	122.5	121.0	121.1	121.1	121.0	122.2	122.6	122.3	122.4
Opacity (%)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Expected Data for Permitting Evaluation

Seminole Electric Cooperative -- Hardee Power Station Unit 3
Emissions and Stack Exit Parameters -- 501FC
Oil Fuel, 42 ppm NOx without SCR

				HRSG	BYPASS	
	#2 Oil		Stack Dia.:	19	23	feet
	19,360	Btu/lb	Stack Ht:	90	75	feet
Sulfur:	0.05	% by weight				

Parameters:	Base Load				75% CT Load				50% CT Load			
Ambient Temperature (deg F)	95	72	59	32	95	72	59	32	95	72	59	32
Relative Humidity (%)	80	80	60	30	80	80	60	30	80	80	60	30
Barometric Pressure (PSIA)	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63
Load Condition (% CT Load)	100	100	100	100	75	75	75	75	50	50	50	50
CT Megawatts (Net)	151.5	163.7	172.7	184.0	113.3	122.5	129.3	138.2	75.0	81.1	85.7	91.6
Water Injection (lb/hour)	96,690	102,190	106,360	111,650	77,870	82,040	85,270	89,430	36,140	37,820	39,190	40,800
Evaporative Cooler On?	*Yes*	*Yes*	*Yes*	*Yes*	No	No	No	No	No	No	No	No
Heat Input (million Btu/hr, HHV)	1,702	1,799	1,872	1,965	1,370	1,444	1,501	1,574	999	1,046	1,084	1,128
Heat Input (million Btu/hr, LHV)	1,598	1,689	1,758	1,845	1,286	1,356	1,409	1,478	938	982	1,018	1,059
Estimated CT Heat Rate (Btu/kwh, LHV)	10,549	10,320	10,178	10,028	11,352	11,067	10,899	10,698	12,510	12,106	11,878	11,562
Fuel Flow (lb/hour)	87,913	92,924	96,694	101,498	70,764	74,587	77,531	81,302	51,601	54,029	55,992	58,264
W/F Ratio	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.7	0.7	0.7	0.7
Exhaust Flow (lb/hour)	3,343,500	3,546,250	3,679,200	3,846,950	2,717,940	2,816,720	2,892,980	2,968,460	2,441,550	2,544,010	2,601,640	2,708,020
CT Exhaust Temperature (deg F)	1,129	1,110	1,099	1,086	1,160	1,160	1,160	1,160	1,063	1,048	1,047	1,022
HRSG Exhaust Temperature (deg F)	285	285	285	285	285	285	285	285	285	285	285	285
Exhaust Moisture (%)	13.47	11.3	10.42	9.5	13.15	11.19	10.3	9.77	10.37	8.21	7.25	6.47
Exhaust O2 (%, wet)	10.99	11.41	11.54	11.67	11.18	11.42	11.49	11.41	12.99	13.37	13.47	13.62
Exhaust O2 (% dry)	12.70	12.86	12.88	12.90	12.87	12.86	12.81	12.65	14.49	14.57	14.52	14.56
Exhaust Mol. Wt.	28.1	28.3	28.4	28.5	28.1	28.3	28.4	28.5	28.3	28.5	28.6	28.7
HRSG Stack Exhaust Flow (ACFM)	1,085,392	1,141,404	1,180,009	1,229,204	881,539	906,180	927,209	948,989	786,093	812,099	827,236	858,448
Bypass Stack Exhaust Flow (ACFM)	2,315,018	2,405,376	2,469,307	2,550,805	1,916,904	1,970,485	2,016,213	2,063,573	1,607,007	1,643,819	1,673,349	1,707,677
Exhaust Flow (DSCFM)	651,092	701,862	732,799	771,190	530,762	557,911	576,579	593,609	488,446	516,765	531,903	556,613
Bypass Stack Exit Velocity (ft/sec)	92.9	96.5	99.1	102.3	76.9	79.0	80.9	82.8	64.5	65.9	67.1	68.5
CC Stack Exit Velocity (ft/sec)	63.8	67.1	69.4	72.3	51.8	53.3	54.5	55.8	46.2	47.7	48.6	50.5
NOx (ppmvd at 15 % O2)	42	42	42	42	42	42	42	42	42	42	42	42
NOx (ppmvd)	58.4	57.2	57.1	57.0	57.1	57.2	57.6	58.8	45.6	45.1	45.4	45.1
NOx (lb/hour)	290.8	307.2	320.0	336.2	232.1	244.3	254.1	266.9	170.5	178.3	184.7	192.1
NOx (lb/million Btu, HHV)	0.171	0.171	0.171	0.171	0.169	0.169	0.169	0.170	0.171	0.170	0.170	0.170
CO (ppmvd at 15 % O2)	14.4	14.7	14.7	14.7	22.0	22.0	21.9	21.4	41.4	41.9	41.6	41.9
CO (ppmvd)	20	20	20	20	30	30	30	30	45	45	45	45
CO (lb/hour)	60.6	65.4	68.3	71.8	74.2	78.0	80.6	82.9	102.4	108.3	111.5	116.7
CO (lb/million Btu, HHV)	0.036	0.036	0.036	0.037	0.054	0.054	0.054	0.053	0.102	0.104	0.103	0.103
SO2 (ppmvd at 15 % O2)	9.6	9.6	9.6	9.6	9.7	9.7	9.7	9.7	9.6	9.6	9.6	9.6
SO2 (ppmvd)	13.3	13.1	13.0	13.0	13.2	13.2	13.3	13.5	10.4	10.3	10.4	10.3
SO2 (lb/hour) [no margin]	87.9	92.9	96.7	101.5	70.8	74.6	77.5	81.3	51.6	54.0	56.0	58.3
SO2 (lb/million Btu, HHV)	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
Total HC's (ppmvd at 15 % O2)	14.4	14.7	14.7	14.7	14.7	14.7	14.6	14.3	27.6	27.9	27.8	27.9
Total HC's (ppmvd)	20	20	20	20	20	20	20	20	30	30	30	30
Total HC's (lb/hour)	34.7	37.4	39.0	41.0	28.3	29.7	30.7	31.6	39.0	41.3	42.5	44.4
Total HC's (lb/million Btu, HHV)	0.020	0.021	0.021	0.021	0.021	0.021	0.020	0.020	0.039	0.039	0.039	0.039

Seminole Electric Cooperative -- Hardee Power Station Unit 3
Emissions and Stack Exit Parameters – 501FC
Oil Fuel, 42 ppm NOx without SCR

				HRSG	BYPASS	
	#2 Oil		Stack Dia.:	19	23	feet
	19,360	Btu/lb	Stack Ht:	90	75	feet
Sulfur:	0.05	% by weight				

Parameters:	Base Load				75% CT Load				50% CT Load			
Ambient Temperature (deg F)	95	72	59	32	95	72	59	32	95	72	59	32
Relative Humidity (%)	80	80	60	30	80	80	60	30	80	80	60	30
Barometric Pressure (PSIA)	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63
Load Condition (% CT Load)	100	100	100	100	75	75	75	75	50	50	50	50
CT Megawatts (Net)	151.5	163.7	172.7	184.0	113.3	122.5	129.3	138.2	75.0	81.1	85.7	91.6
Water Injection (lb/hour)	96,690	102,190	106,360	111,650	77,870	82,040	85,270	89,430	36,140	37,820	39,190	40,800
Evaporative Cooler On?	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No
Heat Input (million Btu/hr, HHV)	1,702	1,799	1,872	1,965	1,370	1,444	1,501	1,574	999	1,046	1,084	1,128
Heat Input (million Btu/hr, LHV)	1,598	1,689	1,758	1,845	1,286	1,356	1,409	1,478	938	982	1,018	1,059
Estimated CT Heat Rate (Btu/kwh, LHV)	10,549	10,320	10,178	10,028	11,352	11,067	10,899	10,698	12,510	12,106	11,878	11,562
Fuel Flow (lb/hour)	87,913	92,924	96,694	101,498	70,764	74,587	77,531	81,302	51,601	54,029	55,992	58,264
W/F Ratio	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	0.7	0.7	0.7	0.7
Exhaust Flow (lb/hour)	3,343,500	3,546,250	3,679,200	3,846,950	2,717,940	2,816,720	2,892,980	2,968,460	2,441,550	2,544,010	2,601,640	2,708,020
CT Exhaust Temperature (deg F)	1,129	1,110	1,099	1,086	1,160	1,160	1,160	1,160	1,063	1,048	1,047	1,022
HRSG Exhaust Temperature (deg F)	285	285	285	285	285	285	285	285	285	285	285	285
Exhaust Moisture (%)	13.47	11.3	10.42	9.5	13.15	11.19	10.3	9.77	10.37	8.21	7.25	6.47
Exhaust O2 (%, wet)	10.99	11.41	11.54	11.67	11.18	11.42	11.49	11.41	12.99	13.37	13.47	13.62
Exhaust O2 (% dry)	12.70	12.86	12.88	12.90	12.87	12.86	12.81	12.65	14.49	14.57	14.52	14.56
Exhaust Mol. Wt.	28.1	28.3	28.4	28.5	28.1	28.3	28.4	28.5	28.3	28.5	28.6	28.7
HRSG Stack Exhaust Flow (ACFM)	1,085,392	1,141,404	1,180,009	1,229,204	881,539	906,180	927,209	948,989	786,093	812,099	827,236	858,448
Bypass Stack Exhaust Flow (ACFM)	2,315,018	2,405,376	2,469,307	2,550,805	1,916,904	1,970,485	2,016,213	2,063,573	1,607,007	1,643,819	1,673,349	1,707,677
Exhaust Flow (DSCFM)	651,092	701,862	732,799	771,190	530,762	557,911	576,579	593,609	488,446	516,765	531,903	556,613
Bypass Stack Exit Velocity (ft/sec)	92.9	96.5	99.1	102.3	76.9	79.0	80.9	82.8	64.5	65.9	67.1	68.5
CC Stack Exit Velocity (ft/sec)	63.8	67.1	69.4	72.3	51.8	53.3	54.5	55.8	46.2	47.7	48.6	50.5
VOC's (ppmvd at 15 % O2)	3.6	3.7	3.7	3.7	3.7	3.7	3.6	3.6	9.2	9.3	9.3	9.3
VOC's (ppmvd)	5	5	5	5	5	5	5	5	10	10	10	10
VOC's (lb/hour)	8.7	9.3	9.8	10.3	7.1	7.4	7.7	7.9	13.0	13.8	14.2	14.8
VOC (lb/million Btu, HHV)	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.013	0.013	0.013	0.013
Particulates, excludes H2SO4												
TSP & PM-10 (lb/hour); 0.01% ash in fuel	37.6	40.3	42.1	44.2	30.6	32.2	33.3	34.4	26.8	28.3	29.1	30.4
TSP & PM-10 (lb/million Btu, HHV)	0.0221	0.0224	0.0225	0.0225	0.0223	0.0223	0.0222	0.0219	0.0268	0.0271	0.0268	0.0270
Particulates, includes H2SO4												
TSP & PM-10 (lb/hour)	56.3	60.1	62.7	65.9	45.7	48.1	49.8	51.8	37.8	39.8	41.0	42.8
TSP & PM-10 (lb/million Btu, HHV)	0.0331	0.0334	0.0335	0.0335	0.0333	0.0333	0.0332	0.0329	0.0378	0.0381	0.0379	0.0380
H2SO4 Mist (lb/hour)	18.7	19.8	20.6	21.6	15.1	15.9	16.5	17.3	11.0	11.5	11.9	12.4
H2SO4 Mist (lb/million Btu)	0.01101	0.01101	0.01101	0.01101	0.01101	0.01101	0.01101	0.01101	0.01101	0.01101	0.01101	0.01101
CO2 (lb/hour)	293514	310399	322693	339264	233915	246890	256383	269146	172295	180467	186769	194687
CO2 (lb/million Btu, HHV)	172	173	172	173	171	171	171	171	172	173	172	173
Opacity	10	10	10	10	10	10	10	10	10	10	10	10

Florida Department of Environmental Protection
Meeting Sign-In Sheet

Re: Seminole Electric Cooperative **Date:** 3-7-95

Name	Representing	Telephone
Bruce Mitchell	FDEP / DARM / BAR	904-488-1344
Al Linero	"	"
Syed Arif	"	"
Manty Costello	"	"
KEN BACHOR	SECI	813-963-0994
JOE WELBORN	SECI	813-963-0994
Steve Palmer	DEP/SCO	904-487-0472
~~SJRWMD~~		
DOUG ROBERTS	HOPPING, GREEN, SAMS & SMITH	904/222-7500

Patty
all

HOPPING GREEN SAMS & SMITH
PROFESSIONAL ASSOCIATION
ATTORNEYS AND COUNSELORS
123 SOUTH CALHOUN STREET
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RICHARD S. BRIGHTMAN
PETER C. CUNNINGHAM
RALPH A. DEMEO
THOMAS M. DEROSE
WILLIAM H. GREEN
WADE L. HOPPING
FRANK E. MATTHEWS
RICHARD D. MELSON
DAVID L. POWELL
WILLIAM D. PRESTON
CAROLYN S. RAEPPLE
GARY P. SAMS
ROBERT P. SMITH
CHERYL G. STUART

KRISTIN M. CONROY
CONNIE C. DURRENCE
JONATHAN S. FOX
JAMES C. GOODLETT
GARY K. HUNTER, JR.
JONATHAN T. JOHNSON
ROBERT A. MANNING
ANGELA R. MORRISON
GARY V. PERKO
KAREN M. PETERSON
MICHAEL P. PETROVICH
DOUGLAS S. ROBERTS
LISA K. RUSHTON
R. SCOTT RUTH
JULIE R. STEINMEYER

OF COUNSEL
CARLOS ALVAREZ
W. ROBERT FOKES

March 7, 1995

RECEIVED
MAR 7 1995
Bureau of
Air Regulation

BY HAND DELIVERY

Kenneth Plante, Esquire
Office of General Counsel
Department of Environmental Protection
2600 Blair Stone Road, Room 654
Tallahassee, FL 32399-2400

Re: Seminole Electric Cooperative, Inc.
Hardee Unit 3
PSD Permit No. PSD-FL-214
Hardee County

Dear Mr. Plante:

Seminole Electric Cooperative, Inc. ("Seminole") received the Department's notice of intent to issue the above-referenced Prevention of Significant Deterioration ("PSD") permit for the construction of a nominal 440 MW combined cycle unit at the Hardee Power Station Site. The notice of intent to issue was received by Seminole on February 24, 1995. The notice of intent was issued by the Department's Bureau of Air Regulation and signed by Mr. Clair Fancy, Bureau Chief. Pursuant to the notice of intent, Seminole has until March 10, 1995, to file a petition for an administrative hearing regarding the permit.

On behalf of Seminole, I hereby request, pursuant to Rule 62-103.070, Florida Administrative Code, an extension to and including April 3, 1995, in which to file a petition for adminstrative proceedings regarding the permit. As good cause for granting the request for extension of time for filing, Seminole states the following:

1. The proposed permit and attached Technical Evaluation and Preliminary Determination contain numerous Specific Conditions and other matters, several of which appear to warrant clarification or correction.

2. Over the last several months, Seminole has conferred and corresponded with the appropriate representatives of the Department regarding this permit and these conditions. Most of the issues have been resolved in concept, but several conditions remain of concern for Seminole. Seminole will continue to work with the Department in an attempt to reach final resolution of this matter.

3. This request is filed simply as a protective measure to avoid waiver of Seminole's right to challenge the proposed permit. Grant of this request will not prejudice either party, but will further their mutual interest and likely avoid the need to initiate formal administrative proceedings.

4. I hereby certify that I have attempted to contact, without success, Douglas Beason and Richard Donelan of the Department's Office of General Counsel to discuss any objections they may have to this request.

Accordingly, I hereby request that you formally extend the time for filing of a petition for administrative proceedings in regards to Department PSD Permit No. PSD-FL-214 to and including April 3, 1995.

Sincerely,

Douglas S. Roberts

DSR/gs

cc: Clair Fancy, DEP, Bureau of Air Regulation
Douglas Beason. Esq., DEP OGC
Richard T. Donelan, Esq., DEP OGC
Steve Palmer, DEP Siting Coordination

SEMINOLE ELECTRIC COOPERATIVE INCORPORATED

RECEIVED
FEB 23 1995
Bureau of Air Regulation

OVERNIGHT

February 9, 1995

Bruce Mitchell
Bureau of Air Regulation
Department of Environmental Protection
Magnolia Courtyard
111 So. Magnolia
Tallahassee, FL 32399

Re: Seminole Electric Coop. Inc.; Hardee Unit 3 - Proposed BACT and Permit Conditions

Dear Bruce:

Seminole Electric Cooperative, Inc. (Seminole) appreciated the opportunity to meet with you and Syed Arif to discuss the Bureau's draft BACT analysis and proposed conditions of certification for Seminole's Hardee Unit 3 project. As we discussed in our meeting on January 31, 1995, the two principal issues associated with the permits for this project are the request for higher emission rates for nitrogen oxides (NO_x) and carbon monoxide (CO) during periods of steam augmentation and an increase in NO_x emissions based upon the fuel bound nitrogen content of the low sulfur fuel oil delivered to the project. As explained below, Seminole believes that these requests are justified and consistent with the objective of achieving the lowest emissions from this project, while considering economic and environmental issues.

The Hardee Unit 3 project is a 440 megawatt facility. It will be comprised of 2 150-megawatt Westinghouse 501F combustion turbines, with each CT connected to a single heat recovery steam generator (HRSG). The electrical output from this Seminole-owned facility will replace electricity Seminole currently purchases from other Florida utilities. The project will therefore supply existing demand for electricity by the members of Seminole's 11 electrical cooperatives in Florida. Unlike many recently permitted projects, the Hardee Unit 3 project is not being undertaken to meet future growth and demand. The demand exists today and will continue to exist at a level of 440 megawatts on the planned in-service date of January 1, 1999. The proposed project with the Westinghouse CTs has therefore been sized to best meet this 440 megawatt demand.

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Steam Augmentation

As Westinghouse representatives explained in our meeting, during those times when the ambient temperature is above approximately 80°F, the electrical output of the combustion turbines during natural gas firing drops due to the decreased density of the air which is forced through the CT. High ambient temperatures cause the air to expand beyond the abilities of the CT's compressors and evaporative chillers to maintain a minimum air density passing through the CT to achieve the 440 megawatt output.

To compensate for the reduced power output during hot, humid days, high pressure steam must be injected into the combustor, mixing with the high pressure air from the CT compressor, to increase the mass flow through the CT. However, the moisture content of the injected steam affects the stability of the combustor pilot flame. To maintain flame stability, additional fuel is fed to the combustor pilot, resulting in an increase in NO_x emissions. The presence of moisture from the steam also causes carbon monoxide to increase to 50ppm levels.

With dry low NO_x combustors operating on natural gas fuel, the NO_x formed in the combustion process is minimized by designing the combustors to operate at very lean fuel to air ratios, an inherently less stable combustion point than occurs in conventional combustors. Thus, dry low NO_x combustors are less tolerant to the reduction in flame stability caused by steam injection. Power or steam augmentation is achieved differently than with conventional combustors by injecting the steam into the combustor casing rather than directly into the combustor. This form of injection disseminates the steam throughout the internal passages rather than focusing it on the flame, although much of the steam still enters the flame zone. Since the thermal NO_x levels are already so low in these DLN designs, there is not a significant further reduction in NO_x from the steam. In the Westinghouse DLN combustor, a central pilot is used in the design to add stability to the lean premix regions of the combustor. The central pilot operates similar to a conventional combustor and thus impacts the NO_x level of the combustor. As steam augmentation is brought on, the percentage of the total fuel that is injected through the central pilot is increased, thus increasing the NO_x levels from the CT from 15ppm to 25ppm.

While steam augmentation increases NO_x emissions, Seminole believes that this is the most acceptable alternative available to provide the needed 440 megawatts of output, considering both environmental and economic factors. Westinghouse and other CT manufacturers do not have CTs that are incrementally larger in output to provide the needed power during these meteorological conditions. Combustion turbines come in standard megawatt capacities or classes and CT manufacturers therefore are unable to exactly size a CT to a given utility's needs in many circumstances.

The other alternatives available to Seminole to meet its 440 megawatt need in these circumstances include installing a stand-alone 20 to 25 megawatt CT to provide the power during the identified meteorological conditions or to purchase power from another utility. As indicated in the analysis by Ken Kosky of KBN, a simple cycle 25 megawatt CT would cost approximately $15.8 million, with an annualized incremental operating cost of $1,993,320 for both capital and fuel costs. Assuming this standalone CT also achieved an emission rate of 15ppm, the cost effectiveness of removing the incremental 83.3 tons of NO_x by installing a small CT would be $23,930 per ton of NO_x removed. This cost effectiveness value greatly exceeds the value the Department has previously established for NO_x removal.

The second alternative available to Seminole to provide the incremental 20 megawatts would involve contracting with another Florida utility to provide power during these periods. Since all other baseload units with relatively low NO_x rates would already be on line when ambient temperatures reach 80°F and greater, it is most likely that the incremental power Seminole needs would be generated from an existing power plant at a much greater NO_x emission rate. Seminole expects that it would cost Seminole $2.8 million per year to contract with another utility (most likely TECO Energy) to provide this incremental power. With the Hardee Unit 3 operating with steam augmentation, total annual emissions are expected to be 212 tons per year. However, if Hardee Unit 3 is denied steam augmentation and replacement power must be purchased by Seminole from another existing plant, Seminole estimates that total NO_x from the Hardee Unit 3 and the other plant would be at least 226 tons per year. Thus, without steam augmentation, NO_x emissions would <u>increase</u> by 14 tons per year while costing Seminole at least $2.8 million. Thus, Seminole would be forced to pay more money to meet its 440 megawatts of need, while increasing total NO_x emissions when compared to the steam augmentation scenario.

Thus, Seminole believes that the PSD permit and conditions of certification should authorize use of steam augmentation at emission rates of 25ppm for NO_x and 50ppm for CO during natural gas firing of the Hardee Unit 3 during those periods when ambient temperatures exceed 80°F, which is estimated to occur 2,000 hours per year.

<u>Fuel Bound Nitrogen</u>

Based upon the information provided by Westinghouse, Seminole continues in its request that it be granted up to an additional 12ppm for NO_x emissions based on the nitrogen content of the fuel oil delivered to the project. Westinghouse has optimized the new dry low NO_x combustors on the large F class CTs to produce the lowest NO_x levels attainable on natural gas, while still maintaining oil firing capability. In order to achieve low NO_x emissions during natural gas firing, the DLN design limits the options for water injection during oil firing and therefore, the ability to achieve lower NO_x levels. Westinghouse has therefore

based its guaranteed NO_x rate of 42ppm during oil firing upon a maximum fuel bound nitrogen content of 0.15% nitrogen.

DLN combustors can only control formation of thermal NO_x; fuel bound nitrogen (FBN) is not subject to combustion controls and is, therefore, "passed" through the machine. To meet the proposed 42ppm NO_x level for fuels with an FBN above 0.015% in fuel oil, the unit operator would be forced to over-control thermal NO_x by adding additional water injection during oil firing. While this may be achievable with conventional combustors or with single fuel (oil only) combustors on smaller CTs, Westinghouse does not believe that can be accomplished with the planned DLN combustor for this F class machine. The DLN is not expected to have any margin in the NO_x rate during oil firing that could be used to buffer the fuel bound nitrogen present in oil. Westinghouse is concerned that to attempt to inject additional water will create stress on the CT components and reduce unit efficiency by increasing the heat rate. Also, operating data during tests on CTs suggest that increasing water injection beyond a water to fuel ratio of 1.0 does not substantially reduce thermal NO_x formation but may significantly increase CO emissions well above proposed allowable levels.

Fuel bound nitrogen is solely a function of the oil refining and supply process. Seminole's investigation indicates that oil refiners are not refining or controlling for nitrogen content in fuel oil. While it appears that lower sulfur fuels (i.e., 0.05% sulfur oil) also have lower nitrogen contents as well, about 25% of the reported samples in one survey indicated that nitrogen content in low sulfur fuel oil still exceeded the threshold of 0.015% nitrogen. Thus, the oil refining industry does not currently continuously produce a low nitrogen/low sulfur fuel oil that would allow Seminole to meet the Department' proposed NO_x level of 42ppm.

Only one fuel oil supplier responded to Seminole's inquiry concerning a guaranteed price for fuel with a specified nitrogen content of no greater than 0.015% nitrogen. That single bidder would charge Seminole an additional 2.27¢ per gallon of fuel oil to supply low sulfur fuel with a nitrogen content of 0.015% or less. Based upon this price premium to Seminole, and assuming a maximum 0.03% nitrogen in the fuel (and an additional 12ppm of NO_x emissions for a total of 54ppm during oil firing) the cost effectiveness of payment of this premium to achieve the Department's proposed 42ppm emission rate would be a minimum of $6,737 per ton of NO_x removed. For fuel oil with a lower FBN content, the cost effectiveness on a per ton removal basis, would be even greater. Therefore, Seminole believes that requiring use of a low nitrogen fuel, which is the effect of the Department's proposed permit limit, is not cost effective and is unnecessary since the average nitrogen content of fuel oil would likely be at or below 0.015% nitrogen in most cases.

Attached for your further reference are the overheads used by Westinghouse and KBN in their presentation at our recent meeting. These are provided to further support Seminole's request for a

differential NO_x emission rate during steam augmentation operation and for a fuel bound nitrogen allowance of up to 12ppm. While we hope that this information is useful to the Department in evaluating this request, if there is further information that you need, we are available to provide that information to you. Again, your attention to this request is appreciated.

Sincerely,

Kenneth L. Bachor
Manager, Environmental Licensing

KLB:jwl
Attachment
cc: w/o attachments
Syed Arif, BAR
Steve Palmer, Office of Siting Coordination
Richard Donelan, Office of General Counsel