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December 20, 2001

Mr. Scott M. Sheplak, P.E.
Florida Department of Environmental Protection
Division of Air Resource Management
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 7902 5390 1188

RE: Tampa Electric Company –
F.J. Gannon Station
Byproduct Beneficiation and Re-use
DEP File No. 0570040–016–AC

Dear Mr. Sheplak:

Tampa Electric Company (TEC) has received your letter of incompleteness dated October 26, 2001 addressing the proposed request to burn unmarketable byproduct materials in F.J. Gannon Station Units 1-6. This correspondence is intended to provide the responses to each question raised by the Department.

FDEP Question 1
Please describe the beneficiation process in detail and include process flow diagram(s).

TEC Response 1
The byproduct beneficiation process is a wet process and therefore will also minimize fugitive particulate matter (PM) emissions.

TEC expects to reuse a maximum amount of 36,500 tons per year (tpy) of the byproduct materials. The unmarketable conditioned fly ash and slag from the silos, precipitator hoppers, ash storage area, and slag bins will be transported via truck to the coalfield, where the byproduct materials will be screened. Spray water will be added at the screen and to the miscellaneous pile at the coalfield as needed to keep the materials wet, thus minimizing fugitive PM emissions. Water application as needed during material movement, screening, and loading operations shall insure that these activities are handled as a wet process. A rubber-tired front-end loader will place the screened byproduct materials on a portable conveyor, which will then be transported to the bunkers, mixed with raw fuel, and reburned in Units 1 through 6.

A simplified process flow diagram of the proposed beneficiation project is shown in Attachment 1, of the permit application package.

TAMPA ELECTRIC COMPANY
P. O. BOX 111 TAMPA, FL 33601-0111
(813) 228-4111

AN EQUAL OPPORTUNITY COMPANY
HTTP://WWW.TAMPAELECTRIC.COM

CUSTOMER SERVICE:
HILLSBOROUGH COUNTY (813) 223-0800
OUTSIDE HILLSBOROUGH COUNTY 1 (888) 223-0800

FDEP Question 2

a. What effect will the combustion of unmarketable byproduct material in Units 1-6 have on air pollutant emissions?

b. What are the potential air pollutant emission increases that will result from the combustion of these materials for air pollutants listed in Chapter 62-212, F.A.C., Table 212.400-2?

TEC Response 2

a. Tampa Electric does not anticipate a measurable impact on air emissions due to the combustion of the byproduct material. Gannon Units 1-6 are currently permitted to re-inject fly ash into each boiler. As stated in the non-PSD permit application, when the beneficiated byproduct material is reintroduced back into the system, the plant will not use the existing closed loop fly ash re-injection system. The proposed rate in which the beneficiated byproduct materials will be reintroduced back into the boilers is less than the current re-injection rate of 100% re-injection. Therefore the combustion of the beneficiated byproduct materials will not cause any air emission increases from the currently permitted operations at Gannon Station. A comparison of the current maximum re-injection rate of 100% re-injection as well as a comparison of stack test reports on Unit 6 with and without fly ash re-injection has been included in Attachment 2.

b. Tampa Electric does not anticipate a measurable impact on air emissions due to the combustion of the byproduct material for the air pollutants listed in Chapter 62-212, F.A.C., Table 212.400-2. As stated in the TEC Response 2a , Gannon Units 1-6 are currently permitted to re-inject fly ash into each boiler. As indicated in the non-PSD permit application, when the beneficiated byproduct material is reintroduced back into the system, the plant will not use the existing closed loop fly ash re-injection system. The proposed rate in which the beneficiated byproduct materials will be reintroduced back into the boilers is less than the current re-injection rate corresponding to 100% re-injection. Therefore the combustion of the beneficiated byproduct materials will not cause any air emission increases from the currently permitted operations at Gannon Station. A comparison of the current maximum re-injection rate of 100% re-injection as well as a comparison of stack test reports on Unit 6 with and without fly ash re-injection has been included in Attachment 2.

FDEP Question 3

a. Will any physical changes need to be made to the boilers?

b. You indicated in your application that you plan to add the byproducts to the raw fuel (coal) in the bunkers. Do you plan to add this material as a percentage (%) of the heat input or % of the mass, tons per hour? If so, at what rate?

TEC Response 3

a. No, there will not be any physical changes made to the boilers to accommodate this process.

b. When combusting the beneficiated byproduct material, TEC will combust a weight percent blend of the byproduct material with coal. As shown in Table 1 of the permit application, the maximum amount of the byproduct material fired is expected to be no more than 100 tons per day (and thus, no more than 50 tons per hour). The estimated maximum fly ash weight percentage for the station from the total fuel consumption rate would be 0.85 %.

FDEP Question 4

a. Why are the byproduct materials "unmarketable"?

b. Is the fly ash and/or slag a hazardous waste?

TEC Response 4

a. Tampa Electric has contracts in place for the sale of the byproduct materials that meet the terms and conditions specified. However, portions of the byproducts do not meet the vendor specifications and cannot be sold under current contracts. The reason that the referenced byproduct materials may be considered "unmarketable" is that they are often high in carbon content, therefore making them recyclable in terms of energy and byproduct recovery.

b. No, fly ash and slag are not considered hazardous wastes.

FDEP Question 5

Please describe the "slag". Is this material the same as bottom ash?

TEC Response 5

Slag is not considered to be the same as bottom ash. Bottom Ash is the ash that settles in a dry-bottom furnace, or is dislodged from the furnace walls, and usually collected in a hopper formed by the frontwall and rearwall tube panels at the bottom of the furnace. It is a glassy material with a high mineral content that results from the burning of coal in dry-bottom furnace. TEC only has one dry-bottom furnace that produces bottom ash, Big Bend Unit 4.

Slag is the consolidated material that settles to the bottom of wet-bottom furnaces. Slag, unlike bottom ash, forms when operating temperatures exceed the ash fusion temperature and remain in a molten state as it is drained from the furnace bottom. This molten ash that is collected on the wet-bottom furnace walls and other surfaces in the lower furnace, melted and quenched in the bottom hoppers then becomes hard and glassy. The material is similar in mineral content to fly ash. Three of Big Bend's units and all six of Gannon Station's current units produce slag.

FDEP Question 6

Please provide a full elemental speciation analysis of the fly ash and slag constituents. Be sure to include heavy metals, i.e., mercury, lead, nickel, etc. on a percentage (%) by weight basis. Will there be any increases in mercury and/or lead air pollutant emissions from combustion?

TEC Response 6

The requested full elemental speciation analysis of the fly ash and slag constituents is enclosed in Attachment 3. Tampa Electric does not anticipate that there will be any increases in heavy metals from the combustion of the beneficiated byproduct material.

FDEP Question 7

Is the "closed loop fly ash re-injection system" mentioned on page 1-2 of your application a permitted activity? Please describe this activity.

TEC Response 7

Yes, the "closed loop fly ash re-injection system" is a permitted activity. Each unit has its own fly ash system that can collect fly ash from the electrostatic precipitator hoppers to be conveyed to a storage silo or re-injection ports on the furnace. Fly ash that is collected in the hoppers of the electrostatic precipitators serving Units 5 and 6 is either re-injected into each individual boiler system or pneumatically conveyed to a 25 foot diameter, 50 foot high silo, Fly ash Silo (No.1). Fly ash that is collected in the hoppers of the electrostatic precipitators of Units 1-4 is either re-injected into each individual boiler system or pneumatically conveyed to a 30 foot diameter, 45.5 foot high silo, Fly ash Silo (No.2). Interlocks prevent any subsystem from conveying fly ash to the silo and the re-injection ports simultaneously. A copy of the process flow diagram, Figure II.D.3.6 (Volume II), that was provided with Tampa Electric's original Title V permit application, dated June 1996, is provided in Attachment 4.

FDEP Question 8

The following questions relate to the material handling operations:

A. The PM/PM10 emissions calculations were based on AP-42 Chapter 13.2. The silt content and moisture content were not in the range of the allowable source conditions for the equation(s). As such, the quality rating should be lowered at least one quality rating and the emissions estimates should be adjusted accordingly (Reference "Using the AP-42 Data Base for Making Exclusionary Rule Applicability Determinations" by Eric Noble 3/2/95).

B. In the emissions calculations, you used a control efficiency of 99% for water spray. As noted in AP-42 Appendix B-2, the maximum control efficiency for dust suppression by water sprays for particle sizes 6-10μm is 90%. In addition, the U.S. Department of Energy, "Technical Guide to Estimating Fugitive Dust Impacts from Coal Handling Operations", Table 4-3 list a maximum control efficiency of 90% for micron droplet water spray systems. It is more appropriate to use the 90% control efficiency listed in AP-42 and the DOE document, since the equation used to estimate emissions is from AP-42. In addition, the 99% control efficiency used in the application is not appropriate. Its use would imply that the control efficiency of a water spray system is equivalent to that of a high efficiency wet scrubber (Reference AP-42 Appendix B-2). If the emissions are adjusted using the 90% control efficiency, then PM emissions from the project would exceed 200 tpy and PM10 emissions would exceed of 100 tpy, and the project would be subject to PSD New Source Review Requirements pursuant to Rule 62-212.400(5), F.A.C. If PSD NSR is triggered, please revise your application accordingly.

C. Per the process description on page 1-2 of your application, it states that a "front-end loader will place the screened byproduct materials on the portable conveyor". After screening, if the material is placed on a "new" pile prior to conveyor, then this transfer point needs to be included in Table 1 and 2 for emissions estimates.

D. In your application, you state that the material will be sufficiently wet.

a. What measures will be employed by TECO to keep the material wet during handling and storage?

b. Is the 5% moisture content used in the emission estimate before or after the application of water?

c. **If the 5% moisture content is after the application of water, then the 90% control efficiency estimate used in the application is not appropriate since it is double counting the water spray controls.**

E. On page 1-3 of your application, you state that emissions from the slag loading/unloading operations were negligible. Similar to the fly ash handling, there are emissions associated with the slag handling. What are the emissions estimates and assumptions taken for the slag handling?

TEC Response 8

A. Table 13.2.4-1 of AP-42 states that silt content of fly ash is between 87 and 81%, with a mean of 80%. TEC used 80% in the emissions calculations. The moisture content of the conditioned fly ash (based on test data) is 10 +/- 3%. TEC conservatively used 5% in the emissions calculations. AP-42 indicates that fly ash moisture content ranges between 26 and 29%, with mean of 27%. Since the test data is not only more representative of the project, but is also more conservative, the emission estimates are also conservative.

B. Included as an attachment to the permit application is an excerpt from a EPRI document, "Fugitive Emissions From Coal-fired Power Plants," stating that close to 100% control can be achieved during most handling operations, if the fly ash is kept sufficiently wet. The control efficiency, in this context, is used as a preventative measure rather than as an emissions control. In other words, if the fly ash is sufficiently wet, it generates little or no fugitive PM emissions since the particles would be adhered to one another, causing a dust suppression effect. Therefore, it is not analogous to a piece of control equipment such as a wet scrubber. Currently the fly ash is routed from the Silo to the pugmill, where it is conditioned by wetting with water and thus causing it to be adequately wet.

C. At the time the permit application was submitted, TEC did not take in account a new pile being formed after screening the byproduct material. There is a possibility that the screened materials will be placed in a new pile prior to the conveyor. Therefore, a new transfer point has been added to Table 1 and 2 for emission estimates. These updated tables are provided in Attachment 5.

D. Additional control efficiency for watering as used in the emissions calculations is not double counting. First, the moisture content is an inherent property of the "conditioned" material. Any additional watering would increase the moisture content of the material. Secondly, TEC used an "uncontrolled" PM emission factor of 110 lb/ton, which is the highest of the available emission factors in AP-42 as well as other documents researched for the proposed screening operation. This emission factor does not allow for any adjustment due to variables such as moisture content or silt content. Therefore, TEC believes that the use of additional control efficiency is justified in the emissions estimates. A comparison of AP-42 emission factors derived from available data has been compiled to support the emission factor and control efficiency selected for this project, Attachment 6.

a. Fly ash transported by dump truck to the coalfield shall be adequately wetted and processed through the pugmill. Spray water will be added to the screen and to the miscellaneous pile at the coalfield as needed to keep he materials wet, thus minimizing fugitive PM emissions. In addition, the dump trucks used to transport fly ash shall utilize tarps at all times except when loading/unloading.

b. The 5% moisture content used in the emission estimate is before the application of water.

c. As stated above, since the 5% moisture content is before the application of water, the 99% control efficiency used in the application is not double counting the water spray controls.

E. It was conservatively assumed (for PM emissions calculation purposes) that all of the byproduct materials are fly ash. Since slag (glassy material) is much heavier and coarser than fly ash and the total process rate is capped, the use of slag would only decrease the potential PM emissions.

FDEP Question 9

Given that the Gannon Station is undergoing a repowering and the station is operating under EPA and DEP settlements, what is the duration of these activities (combustion of unmarketable byproduct materials in Units 1-6 and beneficiation of fly ash/slag)?

TEC Response 9

The duration of the beneficiation and combustion of unmarketable byproduct material in Units 1-6 will extend until the last unit is repowered to natural gas in 2004.

The Professional Engineer and Responsible Official Certifications are included in Attachments 7 and 8, respectively, of this submittal. TEC appreciates the opportunity to provide the additional information contained in this correspondence. If you have any questions, please call me at (813) 641-5261.

Sincerely,

Raiza Calderon
Engineer
Environmental Affairs

Enclosure

c/enc: Mr. Jerry Campbell, EPCHC
Ms. Alice Harman, EPCHC
Mr. Jerry Kissel - FDEP SW
Mr. Scott Sheplak, FDEP

Enclosure

EA/bmr/RC106

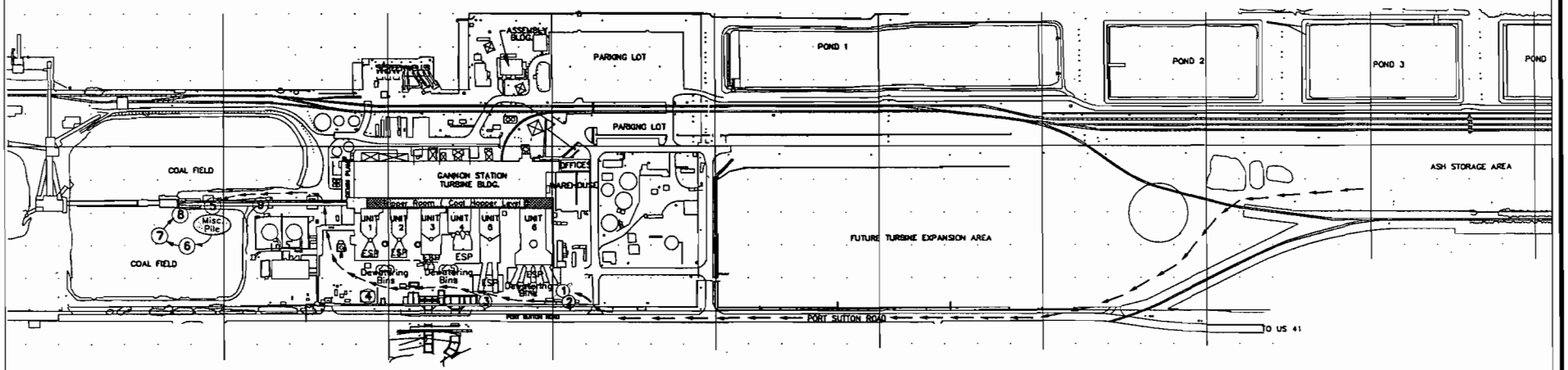
ATTACHEMENT 1

FIGURE 2. PROCESS LAYOUT

FIGURE 3. PROCESS FLOW DIAGRAM

M:\ACAD\010666\FLY ASH ROUTE_2

12/10/01 05:36 PM



FLY ASH ROUTING FROM SILOS TO COALFIELD

Scale: 1" = 300'-0"

LEGEND

1. Fly Ash Silo No.1 (Units 5 and 6)
2. Fly Ash Silo No.2 (Units 1 thru 4)
3. Slag Bin
4. Slag Bin
5. Dumping in Pile on Coal Field
6. Screen the Material for "Chunks"
7. Temporory Pile
8. Looding on Portable Conveyor
9. Up H1 or H2 to Coal Hoppers via the Tripper Room "J" Conveyors

FIGURE 2.

PROCESS LAYOUT.

Source: TECO, 2001.

TECO

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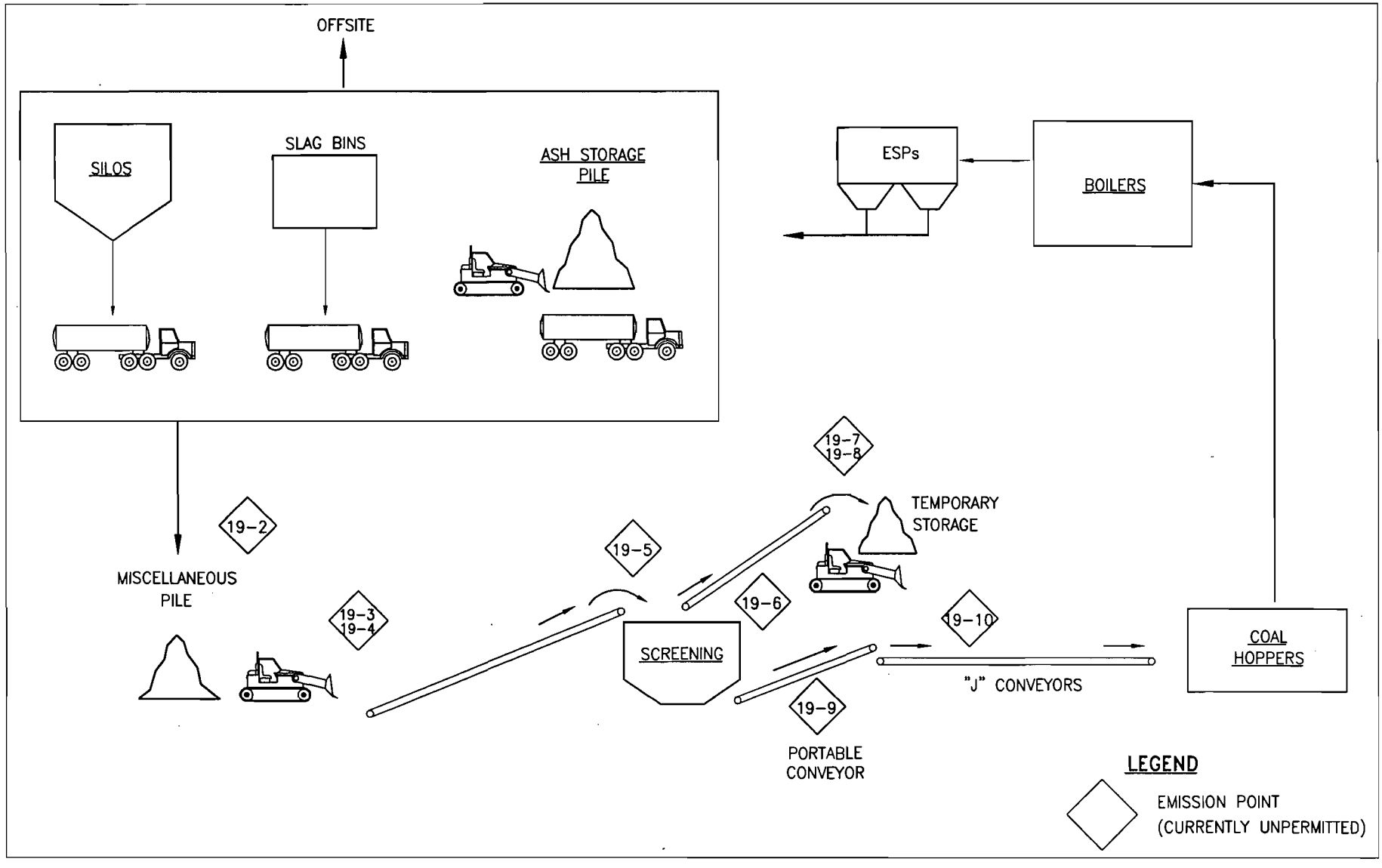


FIGURE 3.

PROCESS FLOW DIAGRAM

Source: ECT, 2001.

ECT

Environmental Consulting & Technology, Inc.

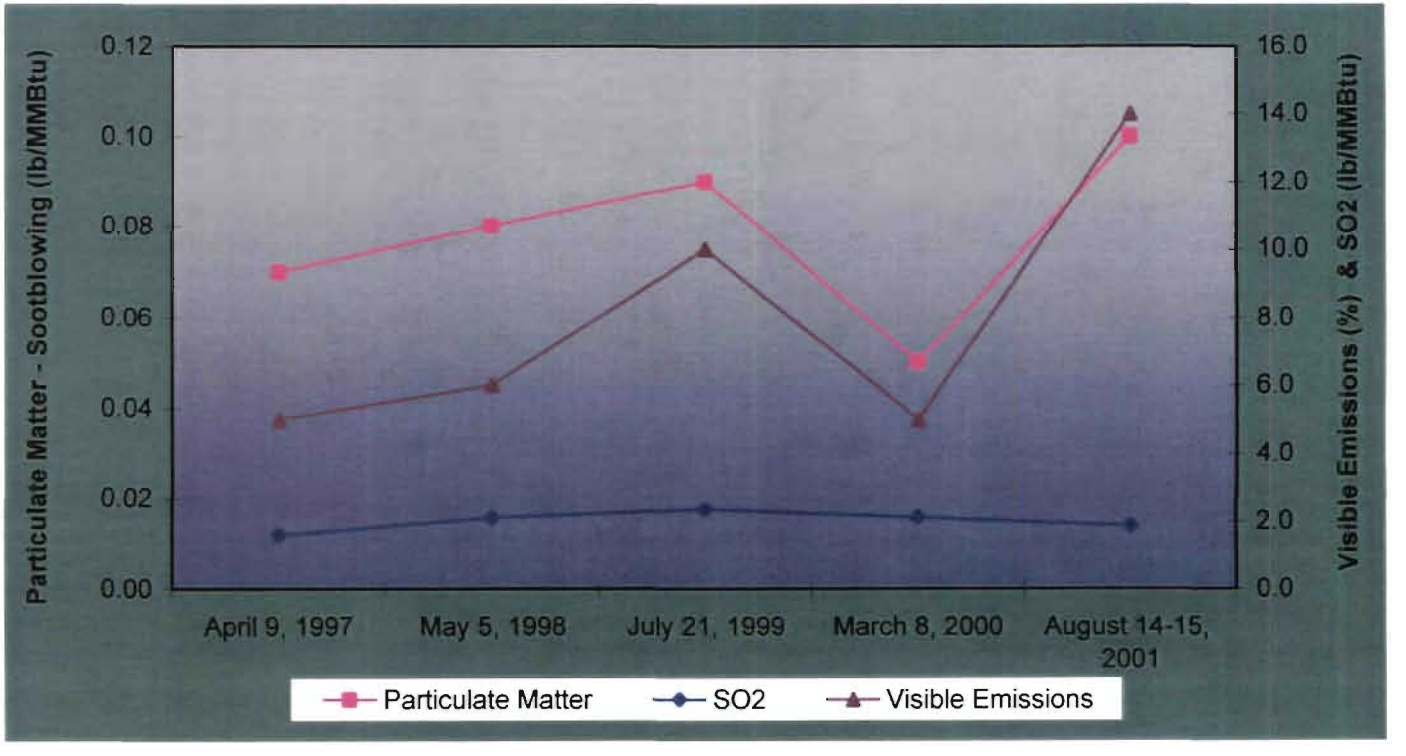
ATTACHEMENT 2

COMPARISON OF FJ GANNON STATION UNIT 6 FLYASH REINJECTION

Comparison of FJ Gannon Station Unit 6 Emissions from Flyash Reinjection

Date	Flyash Reinjection	Particulate Matter		SO_2	Visible Emissions	
		Non-Soot Blowing	Soot Blowing		Non-Soot Blowing	Soot Blowing
	(%)	(lbs / MMBtu)	(lbs / MMBtu)	(lbs / MMBtu)	(%)	(%)
Title V Permit Limit	100	0.1	0.3	2.4	20	20
April 9, 1997	100	-	0.07	1.600	-	5
May 5, 1998	100	-	0.08	2.100	-	6
July 21, 1999	100	-	0.09	2.350	-	10
March 8, 2000	100	-	0.05	2.114	-	5
August 14-15, 2001	0	0.07	0.10	1.865	11	14

* RATA was done on March 13, 2001



EMISSIONS TEST REPORT
PARTICULATE MATTER, SULFUR DIOXIDE, and VISIBLE EMISSIONS EVALUATION
AUGUST 14 – 15, 2001
F.J. GANNON STATION
FACILITY ID NUMBER: 0570040
EMISSION UNIT ID NO: -006
UNIT 6

Prepared For:
Tampa Electric Company
F.J. Gannon Station
P.O. Box 111
Tampa, Florida 33601-0111

Prepared By:
Tampa Electric Company
Environmental Affairs Department
Environmental Services, Air Services Group

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Environmental Services
Air Services Group
5010 Causeway Boulevard
Tampa, Florida 33619- 6130

1.0 SUMMARY OF RESULTS

On August 14 – 15, 2001, the Environmental Services group of Tampa Electric Company, performed particulate matter source emissions tests at the F.J. Gannon Station, boiler number 6 (emissions unit ID number 0570040-006). Testing was conducted according to procedures stipulated by the Florida Department of Environmental Protection (FDEP) for fossil fuel fired steam generators, and requirements in Title V Permit No.: 0570040-002-AV.

The particulate matter emission rate under soot blowing conditions was derived from 3 USEPA Reference Method 17-test runs. The average of the 3 test runs was 0.10 lbs./MMBtu's. The FDEP allowable emission rate under soot-blowing conditions is 0.3 lbs./MMBtu's.

The particulate matter emission rate under non-soot blowing conditions was derived from 3 USEPA Reference Method 17-test runs. The average of the 3 test runs was 0.07 lbs./MMBtu's. The FDEP allowable emission rate under non soot-blowing conditions is 0.1 lbs./MMBtu's.

A 40CFR75 Relative Accuracy Test Audit (RATA) was conducted on March 16, 2001 for sulfur dioxide (SO_2) emissions, and this data was used to demonstrate compliance with the FDEP SO_2 emission rate of 2.4 lbs./MMBtu's. The average of the 9, 21-minute USEPA Reference Method 6C/3A runs was 1.865 lbs./MMBtu's.

Visible emissions were evaluated using a Thermo Environmental Instruments, Model 400 transmissometer (S/N 400B-29003-233/B32), during both soot blowing and non soot-blowing testing. The 1-hour average opacity under soot blowing conditions was 14%. The 1-hour average opacity under non-soot blowing conditions was 11%. The FDEP allowable emission rate is 20 percent opacity.

During the tests, the boiler was operated at an average heat input rate of 3980 MMBtu's/hr. and an average load of 372 Mwe. The average quantity of fuel burned was 172 tons per hour. Details of boiler operations are presented in Appendix C.

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TEST SUMMARY
PARTICULATE EMISSIONS
TEST RESULTS

SOURCE INFORMATION	
PLANT:	F.J. Gannon
DATE:	08/14&15/2001
SAMPLING LOCATION :	Unit #6
OPERATING CONDITION :	Sootblowing

RESULTS	RUN NO. 1-S	RUN NO. 2-S	RUN NO. 3-S	TEST AVERAGE
GAS FLOW RATE				
(dscf/min)	810654	803948	805465	806689
(acf/min)	1318529	1303960	1309787	1310759
STACK TEMP.				
(DEG. F)	309.3	306.3	304.9	306.8
ISOKINETIC				
(%)	102.6	102.5	102.9	102.7
MOISTURE				
(% H2O)	9.30	9.40	9.80	9.50
SAMPLE VOLUME				
(dscf)	35.311	35.011	35.181	35.168
CONDENSATE VOL.				
(ml)	76.4	76.7	81.4	78.2
METER TEMP.				
(DEG. F)	96	97	92	95
PART. EMISSIONS				
(lbs / MM Btu)				
Emissions by F-factor	0.08999	0.09838	0.09936	0.09591

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TEST SUMMARY
PARTICULATE EMISSIONS
TEST RESULTS

SOURCE INFORMATION
PLANT: F.J. GANNON STATION
DATE: 08/14/01
SAMPLING LOCATION : UNIT NO.6
OPERATING CONDITION : NON-SOOTBLOWING

RESULTS	RUN NO. 1	RUN NO. 2	RUN NO. 3	TEST AVERAGE
GAS FLOW RATE				
(dscf/min)	798955	804279	807387	803540
(acf/min)	1295218	1318529	1312701	1308816
STACK TEMP.				
(DEG. F)	307.3	308.9	310.3	308.8
ISOKINETIC				
(%)	102.4	103.7	102.8	103.0
MOISTURE				
(% H2O)	9.70	10.30	9.30	9.77
SAMPLE VOLUME				
(dscf)	34.732	35.406	35.248	35.129
CONDENSATE VOL.				
(ml)	78.8	85.9	76.6	80.4
METER TEMP.				
(DEG. F)	101	102	100	101
PART. EMISSIONS				
(lbs / MM Btu)				
Emissions by F-factor	0.06207	0.07456	0.07897	0.07187

TEST SUMMARY
SULFUR DIOXIDE TEST RESULTS

PLANT:	F. J. GANNON STATION
SAMPLING LOCATION:	BOILER NO. 6
DATE:	March 13, 2001

USEPA Method 6C

Run Number	lbs. SO_2/MMBtu's
1	1.728
2	1.730
3	1.760
4	1.836
5	1.905
6	1.948
7	1.964
8	1.973
9	1.942

TEST AVERAGE: 1.865 lbs. SO_2/MM Btu

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Visible Emissions Determination from Opacity Monitor

Facility: F.J. Gannon
Unit: Unit 6
Operating Conditions: Non-sootblowing

Record#	DATE	TIME	GN1OPA11	Record#	DATE	TIME	GN1OPA11
1	08/14/2001	114900	11.028	31	08/14/2001	121900	11.004
2	08/14/2001	115000	10.957	32	08/14/2001	122000	11.886
3	08/14/2001	115100	11.676	33	08/14/2001	122100	11.198
4	08/14/2001	115200	11.078	34	08/14/2001	122200	11.881
5	08/14/2001	115300	12.798	35	08/14/2001	122300	10.440
6	08/14/2001	115400	11.199	36	08/14/2001	122400	10.409
7	08/14/2001	115500	10.919	37	08/14/2001	122500	10.420
8	08/14/2001	115600	10.829	38	08/14/2001	122600	10.385
9	08/14/2001	115700	10.889	39	08/14/2001	122700	10.380
10	08/14/2001	115800	10.955	40	08/14/2001	122800	11.387
11	08/14/2001	115900	10.862	41	08/14/2001	122900	11.472
12	08/14/2001	120000	10.893	42	08/14/2001	123000	11.447
13	08/14/2001	120100	10.896	43	08/14/2001	123100	11.423
14	08/14/2001	120200	10.867	44	08/14/2001	123200	11.436
15	08/14/2001	120300	10.881	45	08/14/2001	123300	10.459
16	08/14/2001	120400	11.986	46	08/14/2001	123400	10.416
17	08/14/2001	120500	11.165	47	08/14/2001	123500	9.584
18	08/14/2001	120600	11.754	48	08/14/2001	123600	9.364
19	08/14/2001	120700	10.929	49	08/14/2001	123700	9.369
20	08/14/2001	120800	10.919	50	08/14/2001	123800	10.009
21	08/14/2001	120900	10.996	51	08/14/2001	123900	10.376
22	08/14/2001	121000	10.705	52	08/14/2001	124000	10.357
23	08/14/2001	121100	9.946	53	08/14/2001	124100	10.743
24	08/14/2001	121200	10.193	54	08/14/2001	124200	11.539
25	08/14/2001	121300	10.969	55	08/14/2001	124300	11.512
26	08/14/2001	121400	11.105	56	08/14/2001	124400	11.538
27	08/14/2001	121500	12.016	57	08/14/2001	124500	10.660
28	08/14/2001	121600	12.018	58	08/14/2001	124600	11.179
29	08/14/2001	121700	11.993	59	08/14/2001	124700	11.622
30	08/14/2001	121800	12.004	60	08/14/2001	124800	11.661

Test Average:	11.016 %
Minimum One Minute Average:	9.364 %
Maximum One Minute Average:	12.798 %
Maximum Six Minute Average:	11.820 %

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Visible Emissions Determination from Opacity Monitor

Facility: F.J. Gannon
Unit: Unit 6
Operating Conditions: Sootblowing

Record#	DATE	TIME	GN1OPA11	Record#	DATE	TIME	GN1OPA11
1	08/14/2001	184100	13.357	31	08/14/2001	191100	14.417
2	08/14/2001	184200	12.722	32	08/14/2001	191200	13.349
3	08/14/2001	184300	12.749	33	08/14/2001	191300	13.476
4	08/14/2001	184400	13.323	34	08/14/2001	191400	13.144
5	08/14/2001	184500	14.514	35	08/14/2001	191500	13.245
6	08/14/2001	184600	15.491	36	08/14/2001	191600	13.584
7	08/14/2001	184700	13.691	37	08/14/2001	191700	13.788
8	08/14/2001	184800	13.696	38	08/14/2001	191800	14.551
9	08/14/2001	184900	13.705	39	08/14/2001	191900	15.484
10	08/14/2001	185000	14.220	40	08/14/2001	192000	14.101
11	08/14/2001	185100	14.890	41	08/14/2001	192100	13.190
12	08/14/2001	185200	14.474	42	08/14/2001	192200	12.900
13	08/14/2001	185300	13.702	43	08/14/2001	192300	11.912
14	08/14/2001	185400	13.076	44	08/14/2001	192400	11.908
15	08/14/2001	185500	13.372	45	08/14/2001	192500	12.691
16	08/14/2001	185600	14.741	46	08/14/2001	192600	13.272
17	08/14/2001	185700	14.609	47	08/14/2001	192700	13.568
18	08/14/2001	185800	13.705	48	08/14/2001	192800	14.871
19	08/14/2001	185900	13.651	49	08/14/2001	192900	16.959
20	08/14/2001	190000	13.605	50	08/14/2001	193000	15.336
21	08/14/2001	190100	12.637	51	08/14/2001	193100	15.615
22	08/14/2001	190200	12.561	52	08/14/2001	193200	14.840
23	08/14/2001	190300	12.806	53	08/14/2001	193300	14.421
24	08/14/2001	190400	12.669	54	08/14/2001	193400	13.542
25	08/14/2001	190500	13.255	55	08/14/2001	193500	13.074
26	08/14/2001	190600	14.482	56	08/14/2001	193600	14.581
27	08/14/2001	190700	15.453	57	08/14/2001	193700	14.523
28	08/14/2001	190800	16.833	58	08/14/2001	193800	14.577
29	08/14/2001	190900	16.079	59	08/14/2001	193900	13.674
30	08/14/2001	191000	16.356	60	08/14/2001	194000	13.473

Test Average:	13.975 %
Minimum One Minute Average:	11.908 %
Maximum One Minute Average:	16.959 %
Maximum Six Minute Average:	15.603 %

COMPLIANCE TEST DATA
F. J. GANNON STATION

BOILER NO. 6 TEST DATE 8/14/01

UNIT LOAD (MN) 368

BASE LOADED (TIME) 0500

TEST DATA

MEGAWATTS INTEGRATOR				INITIALS
BEGIN MWH	1249	BEGIN SAMPLING	835053	EB
END MWH	0139	END SAMPLING	839837	EB

SOOTBLOWING

RUN	BEGIN TIME	END TIME	INITIALS
1NSB	1249	1421	EB/
2NSB	1514	1647	EB/
3 NSB	1732	1902	EB/
1SB	1941	2112	EB/

FLYASH REINJECTION

RUN	REINJECTION (Y/N)	% REINJECTION	INITIALS
1NSB	no	0%	EB/ TGC
2NSB	no	0%	EB/ TGC
3NSB	no	0%	EB/ E.P.
1SB	no	0%	EB/ E.P.

COMPLIANCE TEST DATA

F. J. GANNON STATION

BOILER NO. 6 TEST DATE 8/14/01

UNIT LOAD (MN) 368

BASE LOADED (TIME) 0500

TEST DATA

MEGAWATTS INTEGRATOR				INITIALS
BEGIN MWH	1249	BEGIN SAMPLING	835053	CB
END MWH	0139	END SAMPLING	839837	CB

SOOTBLOWING

RUN	BEGIN TIME	END TIME	INITIALS
2SB	2155	2327	CB/EJH
3SB	0008	0139	CB/EJH

FLYASH REINJECTION

RUN	REINJECTION (Y/N)	% REINJECTION	INITIALS
2SB	no	0%	CB/ E.P
3SB	no	0%	CB/ E.P

MCD\COMPFORM.WP

STACK TEST CHECKLIST

UNIT NO. 6 DATE 8/14/01

SHIFT Day

BTO check items

Fly ash system operational - YES/(NO) _____(Initial) TGC
(check for stuck feeder gates or blower failure)
100% Ash reinjection - YES/(NO) _____(Initial) TGC
Precipitator fully operational - (YES)/NO * (Initial) TGC
COMMENTS* C1-D1 EAST SIDE HOPPER HI-LEVEL AND GROUND OUT.

SHIFT Night

BTO check items

Fly ash sytem operational - YES/(NO) E.P. (Initial)
(check for stuck feeder gates or blower failure)
100% Ash reinjection - YES/(NO) E.P. (Initial)
Precipitator fully operational - (YES)/NO E.P. (Initial)
COMMENTS C1D1 east side grounded

SHIFT _____

BTO check items

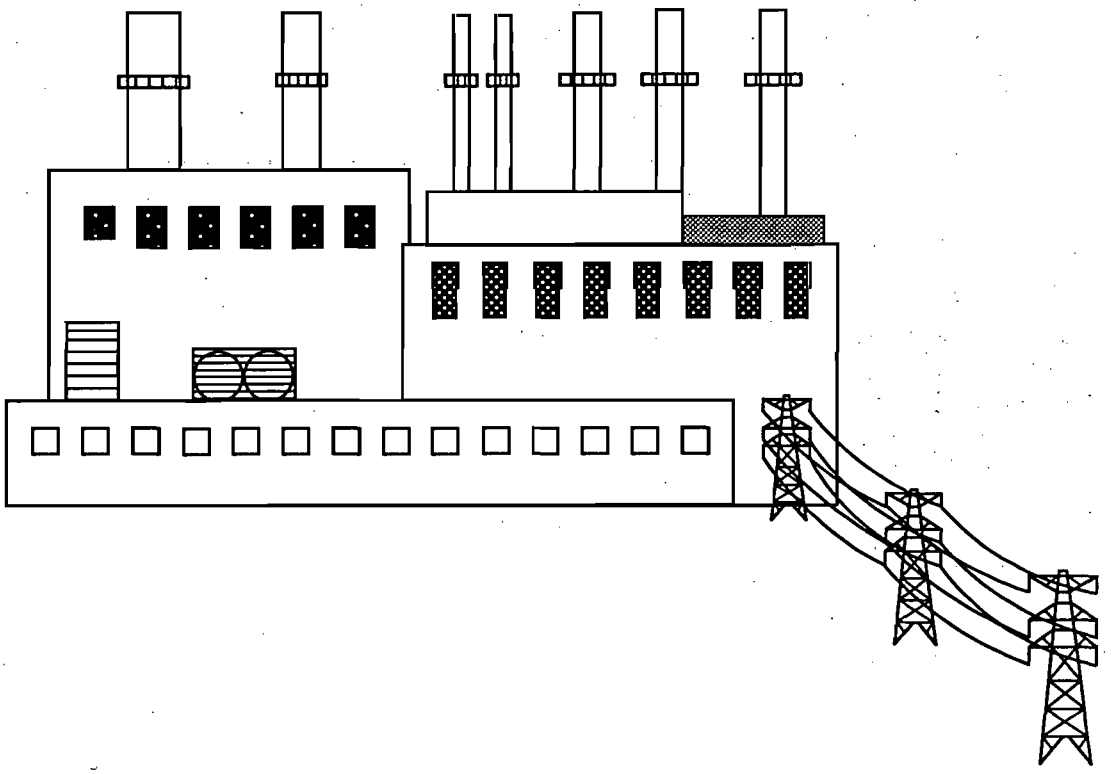
Fly ash system operational - YES/NO _____(Initial)
(check for stuck feeder gates or blower failure)
100% Ash reinjection - YES/NO _____(Initial)
Precipitator fully operational - YES/NO _____(Initial)
COMMENTS _____

TECO
TAMPA ELECTRIC

CORPORATE ENVIRONMENTAL SERVICES

AIR PROGRAMS REPORT

SOURCE EMISSION TEST
F. J. GANNON GENERATING STATION
BOILER NO. 6
AIRS #0570040
MARCH 8, 2000
PARTICULATE, SULFUR DIOXIDE
AND VISIBLE EMISSION TESTING



1.0 SUMMARY OF RESULTS

On March 8, 2000, Corporate Environmental Services, Air Services and Auditing group of Tampa Electric Company, performed source emission tests at the Gannon Station, Boiler number 6, Airs # 0570040. Testing was conducted according to procedures stipulated by the Florida Department of Environmental Protection (FDEP) for fossil fuel steam generators, and requirements in Permit # A029-203512. A summary of the test results are shown in Section 3.0.

The particulate emission rate, under sootblowing conditions, was derived from three test runs. The calculated average is 0.05 pounds of particulate matter per million Btu ($lb/10^6$ Btu). The FDEP allowable emission rate under sootblowing conditions is 0.3 $lb/10^6$ Btu. This test under sootblowing conditions demonstrates compliance with the non-sootblowing emission limitation of 0.1 lb. $/10^6$ Btu.

The sulfur dioxide (SO_2) emission rate was derived from three test runs. The calculated average is 2.1 $lb/10^6$ Btu. The FDEP allowable emission rate is 2.4 $lb/10^6$ Btu.

A visible emission test was performed during sootblowing conditions. The average opacity observed during the one hour test was 5 percent. The FDEP allowable emission rate is 20 percent opacity.

During the tests on March 8, 2000 the boiler was operated at an average heat input rate of 3685 X 10^6 Btu/hr and a average load of 355 megawatts. The average quantity of fuel burned was 155 tons per hour. Details of boiler operation are included in Appendix C.

TECO
TAMPA ELECTRIC

TEST SUMMARY
PARTICULATE EMISSIONS
TEST RESULTS

SOURCE INFORMATION
PLANT: F.J. GANNON STATION
DATE: 03/08/00
SAMPLING LOCATION : UNIT NO.6
OPERATING CONDITION : SOOTBLOWING

RESULTS	RUN NO. 2-S	RUN NO. 3-S	RUN NO. 4-S	TEST AVERAGE
GAS FLOW RATE				
(dscf/min)	746394	741327	756183	747968
(acf/min)	1178663	1168464	1194689	1180605
STACK TEMP.				
(DEG. F)	294.5	293.9	297.8	295.4
ISOKINETIC				
(%)	103.0	103.4	102.3	102.9
MOISTURE				
(% H2O)	9.60	9.50	9.40	9.50
SAMPLE VOLUME				
(dscf)	35.452	35.377	35.715	35.515
CONDENSATE VOL.				
(ml)	79.9	78.4	78.2	78.8
METER TEMP.				
(DEG. F)	87	93	97	92
PART. EMISSIONS				
(lbs / MM Btu)				
Emissions by F-factor	0.04604	0.04074	0.06102	0.04927

TEST SUMMARY
SULFUR DIOXIDE TEST RESULTS

PLANT:	F. J. GANNON STATION
SAMPLING LOCATION:	BOILER NO. 6
DATE:	MARCH 8, 2000

USEPA Method 6C

RUN NO.	**lbs. SO_2 /MM Btu**
1	2.120
2	2.100
3	2.122

TEST AVERAGE: 2.114 lbs SO2/MM Btu

COMPLIANCE TEST DATA
F. J. GANNON STATION

BOILER NO. 6 TEST DATE 3/8/00

UNIT LOAD (MN) 360 MW

BASE LOADED (TIME) 6:00 AM

TEST DATA

MEGAWATTS INTEGRATOR			INITIALS
BEGIN MWH 738696		BEGIN SAMPLING 0815	CB
END MWH ~~740269~~ 740654	CM Sarby	END SAMPLING 1341	CB

SOOTBLOWING

RUN	BEGIN TIME	END TIME	INITIALS
1SB	0815	—	CB/
2SB	0931	1036	CB/
3SB	1104	1210	CB/
4SB	1237	1341	CB/

FLYASH REINJECTION

RUN	REINJECTION (Y/N)	% REINJECTION	INITIALS
1SB	yes	100%	CB/
2SB	yes	100%	CB/
3SB	yes	100%	CB/
4SB	yes	100%	CB/

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ATTACHEMENT 3

FULL ELEMENTAL SPECIATION ANALYSIS OF FLY ASH AND SLAG

Environmental Affairs
Laboratory

5012 Causeway Blvd * Tampa Fl. 33619 * Ph (813)630-7378 * Fax (813)630-7360 * CompQAP #910140G * DOH

Report Raiza Calderon, EA-PSC Report 12/14/2001

Laboratory ID: *AA63293*

Sample

Location **SPECL-EP**
Location Envir. Plan. Sample Request
Project Account M73
GANNON STATION FLYASH
RESULT REPORTED AS DRY BASIS
FL YASH

Sampled
Date 11/29/2001
Time 12:00:00 AM

Laboratory Results

Parameter	Result	Units	MDL	Lower Limit	Upper Limit	Violation Check
60 Mesh Residual Moisture, Flyash	10.82	%				
Aluminum Oxide, Al203	20.5	%				
Calcium Oxide, CaO	2.6	%				
Iron Oxide, Fe2O3	13.9	%				
Magnesium Oxide, MgO	1.3	%				
Mercury by Cold Vapor	0.306	mg/kg				
Phosphorus, P2O5	0.4	%				
Potassium Oxide, K2O	2.4	%				
Silicon Dioxide, SiO2	50.0	%				
Sodium Oxide, Na2O	1.0	%				
Sulfur in Ash	0.36	%	0.01			
Titanium Dioxide, TiO2	1.1	%				
Arsenic	215.4	ug/g dry basis				
Barium	571.8	ug/g dry basis				
Beryllium	11.6	ug/g dry basis				
Chromium	299.2	ug/g dry basis				
Cobalt	53.9	ug/g dry basis				
Copper	97.2	ug/g dry basis				
Lead	214.4	ug/g dry basis				
Manganese	389.8	ug/g dry basis				
Molybdenum	26.3	ug/g dry basis				
Nickel	161.1	ug/g dry basis				
Vanadium	300.2	ug/g dry basis				
Zinc	316.4	ug/g dry basis				

Environmental Affairs
Laboratory

5012 Causeway Blvd * Tampa Fl. 33619 * Ph (813)630-7378 * Fax (813)630-7360 * CompQAP #910140G * DOH

Comment

Result reported as dry basis flyash.

Robert
Manager, Environmental Services

Environmental Affairs
Laboratory

5012 Causeway Blvd * Tampa Fl. 33619 * Ph (813)630-7378 * Fax (813)630-7360 * CompQAP #910140G * DOH

Report Raiza Calderon, EA-PSC Report 12/14/2001

Laboratory ID: *AA63294*

Sample

Location **SPECL-EP**
Location Envir. Plan. Sample Request
Project Account M73
GANNON STATION SLAG
RESULT REPORTED AS DRY BASIS SLAG

Sampled
Date 11/29/2001
Time 12:00:00 AM

Laboratory Results

Parameter	Result	Units	MDL	Lower Limit	Upper Limit	Violation Check
60 Mesh Residual Moisture, Slag	1.94	%				
Aluminum Oxide, Al203	21.1	%				
Calcium Oxide, CaO	2.8	%				
Iron Oxide, Fe2O3	16.1	%				
Magnesium Oxide, MgO	1.3	%				
Mercury by Cold Vapor	0.063	mg/kg				
Phosphorus, P2O5	0.3	%				
Potassium Oxide, K2O	2.00	%				
Silicon Dioxide, SiO2	53.7	%				
Sodium Oxide, Na2O	0.7	%				
Sulfur in Ash	0.02	%	0.01			
Titanium Dioxide, TiO2	0.9	%				
Arsenic	8.1	ug/g dry basis				
Barium	538.9	ug/g dry basis				
Beryllium	7.9	ug/g dry basis				
Chromium	164.1	ug/g dry basis				
Cobalt	77.0	ug/g dry basis				
Copper	39.3	ug/g dry basis				
Lead	27.8	ug/g dry basis				
Manganese	496.2	ug/g dry basis				
Molybdenum	3.0	ug/g dry basis				
Nickel	114.3	ug/g dry basis				
Vanadium	206.8	ug/g dry basis				
Zinc	74.2	ug/g dry basis				

Environmental Affairs
Laboratory

5012 Causeway Blvd * Tampa Fl. 33619 * Ph (813)630-7378 * Fax (813)630-7360 * CompQAP #910140G * DOH

Comment

Result reported as dry basis Slag

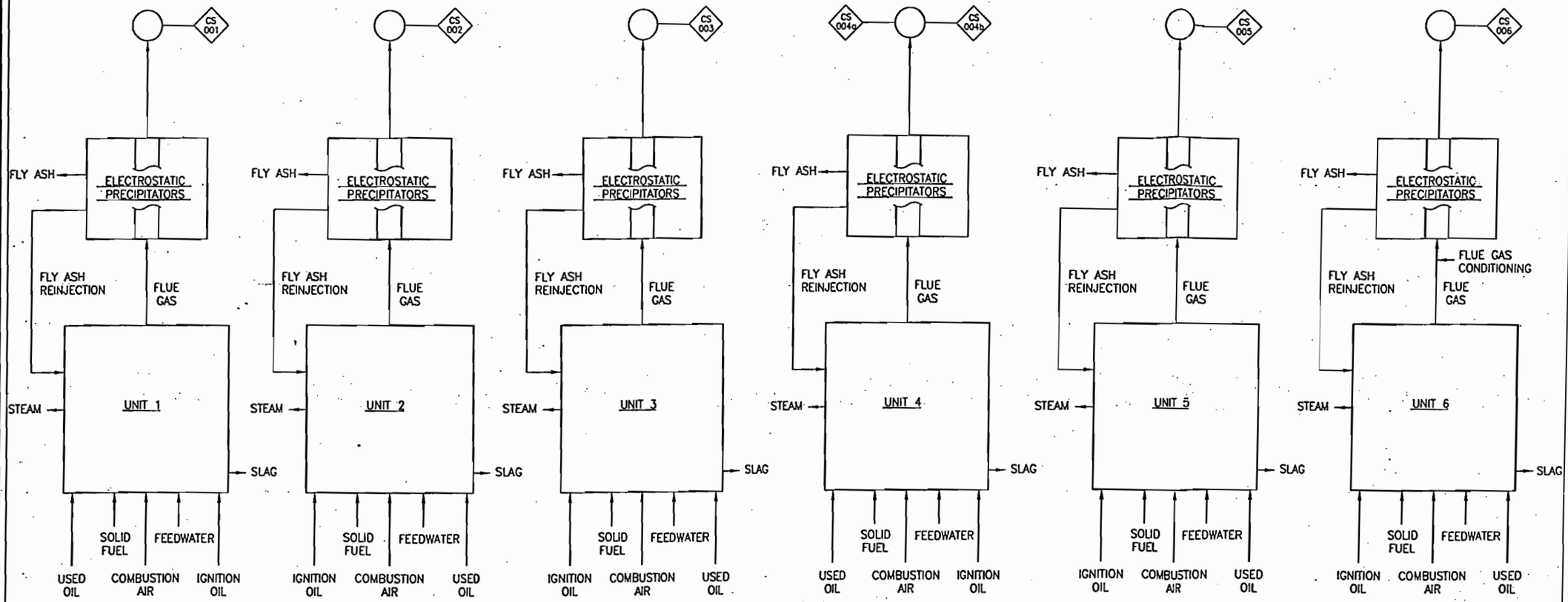
Robert
Manager, Environmental Services

ATTACHEMENT 4

BOILER PROCESS FLOW DIAGRAM WITH FLY ASH REINJECTION
(TITLE V PERMIT APPLICATION (VOLUME II) - FIGURE II.D.3.6)

F:\ACAD\94500\GANNON\BOIL01

06/04/96



LEGEND

CS-00 EMISSION POINT

FIGURE II.D.3.6.

F.J. GANNON STATION

BOILER PROCESS FLOW DIAGRAM

Source: ECT, 1996.

ECT

Environmental Consulting & Technology, Inc.

ATTACHEMENT 5

TABLE 1. ESTIMATED PM10 EMISSIONS (PROPOSED NEW SOURCES)

TABLE 2. ESTIMATED PM EMISSIONS (PROPOSED NEW SOURCES)

Table 1. Estimated PM_{10} Emissions (Proposed New Sources)

EU ID	Process Description	Reference to Flow Diag.	Emission Factors		Emission Factor Source	Operating Parameters				Potential PM_{10} Emissions	
			Factor	Units		*tpy*	*max. tph*	*max. hr/yr*	*VMT/yr*	*(tpy)*	*(lb/hr)*
AH006	Truck Traffic on Paved Roads	Arrows	0.4136	*lb/VMT*	AP-42 13.2.1 (10/97)	n/a	n/a	n/a	691	0.1072	0.0766
AH007	Unloading Byproducts to Misc. Pile	5	0.0006	*lb/ton*	AP-42, 13.2.4 (1/95)	36500	50	2912	n/a	0.0115	0.0314
AH008	Working with Misc. Pile	5	6.0762	*lb/VMT*	AP-42, 13.2.2 (9/98)	36500	50	2912	183	0.5545	0.3808
AH009	Wind Erosion from Misc. Pile	5	n/a	n/a	AP-42, 13.2.5 (1/95)	n/a	n/a	n/a	n/a	0.0021	0.0007
AH010	Transfer from Misc. Pile to Screen	5 to 6	0.0006	*lb/ton*	AP-42, 13.2.4 (1/95)	36500	50	2912	n/a	0.0011	0.0031
AH011	Screening	6	55.0	*lb/ton*	AP-42, 11.8 (1/95)	36500	50	2912	n/a	10.04	27.50
AH012	Transfer from Screen to Temporary Pile		0.0006	*lb/ton*	AP-42, 13.2.4 (1/95)	36500	50	2912	n/a	0.0011	0.0031
AH013	Wind Erosion from Temporary Pile		n/a	n/a	AP-42, 13.2.5 (1/95)	n/a	n/a	n/a	n/a	0.0021	0.0007
AH014	Transfer from Temp. Pile to Portable Conveyor	6 to 7	0.0006	*lb/ton*	AP-42, 13.2.4 (1/95)	36500	50	2912	n/a	0.0011	0.0031
AH015	Tranfer from Portable Conveyor to "J" Conveyors	7 to 8	0.0006	*lb/ton*	AP-42, 13.2.4 (1/95)	36500	50	2912	n/a	0.0011	0.0031
	TOTALS									**10.72**	**28.00**

Note:

n/a = not applicable

Assumed $PM_{10}/PM = 0.5$ for the screening emission factor

Applied a control efficiency of 90-99% for keeping the materials sufficiently wet (EPRI, 1984)

Applied a control efficiency of 25% to the uncontrolled truck traffic emissions for using precautions such as speed limits (AP-40)

tpy = tons per year, tph = tons per hour, lb = pounds, yr = year

hr = hours, VMT = vehicle miles traveled

PM = Particulate Matter, PM_{10} = Particulate Matter Less than 10 micron in aerodynamic diameter

Sources: TECO, 2001; U.S. EPA, 1995-1998; ECT, 2001.

Table 2. Estimated PM Emissions (Proposed New Sources)

EU ID	Process Description	Reference to Flow Diag.	Emission Factors		Emission Factor Source	Operating Parameters				Potential PM Emissions	
			Factor	Units		*tpy*	*max. tph*	*max. hr/yr*	*VMT/yr*	*(tpy)*	*(lb/hr)*
AH006	Truck Traffic on Paved Roads	Arrows	2.1195	*lb/VMT*	AP-42 13.2.1 (10/97)	n/a	n/a	n/a	691	0.5494	0.3925
AH007	Unloading Byproducts to Misc. Pile	5	0.0013	*lb/ton*	AP-42, 13.2.4 (1/95)	36500	50	2912	n/a	0.0243	0.0664
AH008	Working with Misc. Pile	5	23.37	*lb/VMT*	AP-42, 13.2.2 (9/98)	36500	50	2912	183	2.1325	1.4646
AH009	Wind Erosion from Misc. Pile	5	n/a	n/a	AP-42, 13.2.5 (1/95)	n/a	n/a	n/a	n/a	0.0042	0.0014
AH010	Transfer from Misc. Pile to Screen	5 to 6	0.0013	*lb/ton*	AP-42, 13.2.4 (1/95)	36500	50	2912	n/a	0.0024	0.0066
AH011	Screening	6	110.0	*lb/ton*	AP-42, 11.8 (1/95)	36500	50	2912	n/a	20.0750	55.00
AH012	Transfer from Screen to Temporary Pile		0.0013	*lb/ton*	AP-42, 13.2.4 (1/95)	36500	50	2912	n/a	0.0024	0.0066
AH013	Wind Erosion from Temporary Pile		n/a	n/a	AP-42, 13.2.5 (1/95)	n/a	n/a	n/a	n/a	0.0042	0.0014
AH014	Transfer from Temp. Pile to Portable Conveyor	6 to 7	0.0013	*lb/ton*	AP-42, 13.2.4 (1/95)	36500	50	2912	n/a	0.0024	0.0066
AH015	Tranfer from Portable Conveyor to "J" Conveyors	7 to 8	0.0013	*lb/ton*	AP-42, 13.2.4 (1/95)	36500	50	2912	n/a	0.0024	0.0066
	TOTALS									**22.80**	**56.95**

Note:

n/a = not applicable

Applied a control efficiency of 90-99% for keeping the materials sufficiently wet (EPRI, 1984)

Applied a control efficiency of 25% to the uncontrolled truck traffic emissions for using precautions such as speed limits (AP-40)

tpy = tons per year, tph = tons per hour, lb = pounds, yr = year

hr = hours, VMT = vehicle miles traveled

PM = Particulate Matter, PM10 = Particulate Matter Less than 10 micron in aerodynamic diameter

Sources: TECO, 2001; U.S. EPA, 1995-1998; ECT, 2001.

ATTACHEMENT 6

EMISSION FACTOR DERIVATION BASED ON AVAILABLE DATA
(TEC-GANNON, BYPRODUCT BENEFICIATION PROJECT)

Emission Factor Derivation Based on Available Data (TEC-Gannon, Byproduct Beneficiation Project)

Source	Reference	Material	Process	PM	PM-10	EF (lb/ton) Controlled	EF (lb/ton) Uncontrolled	Control Type	Assumed EF (%)	EF Rating
AP-42	Table 11.17-4	Lime	Primary Screening	x		0.00061		Fabric Filter		D
AP-42	Table 11.17-4	Lime	Scalping Screen and Hammermill	x			0.62			E
AP-42	Table 11.17-4	Lime	Product Loading (Open Truck)	x			1.5			D
AP-42	Table 11.26-1	Talc	Screening	x		0.0086		Fabric Filter		D
AP-42	Table 11.12-2	Cement	Loading/Unloading	x			0.145			D-E
AP-42	Table 11.19.2-1	Crushed Stone	Fines Screening		x	0.00441	0.1491	Baghouse	97.0%	E
AP-42	Table 11.19.2-1	Crushed Stone	Fines Screening	x		0.00926	0.3131			
AP-42	Table 11.8-2	Fly Ash	Crushing, Screening, Sintering, Storage	x			110			E
EPRI	Table 3-23	Fly Ash	Handling	x			66		up to 100%	E
EPRI	Table 3-23	Fly Ash	Handling	x			110		up to 100%	E
TECO/ECT		Fly Ash/Slag	Handling	x		1.1	110	Wetness	99.0%	
		Fly Ash/Slag	Handling		x	0.55	55	Wetness	99.0%	

ATTACHEMENT 7

PROFESSIONAL ENGINEER CERTIFICATION

TAMPA ELECTRIC COMPANY
FJ GANNON STATION
BYPRODUCT BENEFICIATION AND RE-USE

Professional Engineer Certification

Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollutant control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any modifications to the emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of air pollutants not regulated for an emissions unit, based solely upon the materials, information and calculations provided with this certification.

Signature _____ Date 12/19/2001

(seal)

Certification is applicable to the non-PSD permit application request for the Tampa Electric Company FJ Gannon Station byproduct beneficiation and re-use process.

ATTACHEMENT 8

RESPONSIBLE OFFICIAL CERTIFICATION

Responsible Official Certification

I have reviewed the testing results in this report, and hereby certify that this test report is authentic and accurate to the best of my knowledge.

Date 12-20-01

Signature Karen A. Sheffield
General Manager
FJ Gannon Power Station