UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

NOV 12 1992

4APT-AEB

Mr. Clair H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: TECO Big Bend Proposed Modification

Dear Mr. Fancy:

As requested by your letter dated September 24, 1992, we have reviewed the proposed modification to the above referenced facility consisting of changes to the coal yard. It appears from the information submitted that the emissions increase resulting from the modification will be approximately 14 tons per year of particulate matter. If this is the case, then the increase would be a minor modification to an existing major source and not subject to Prevention of Significant Deterioration (PSD) requirements. Even though the proposed change would require a modification of the Conditions of Certification under Florida's Power Plant Siting Act (PPSA), there would be no need to modify the existing PSD permit for the facility (PSD-FL-040).

Thank you for the opportunity to review this package. If you have any questions or comments, please contact Mr. Gregg Worley of my staff at (404) 347-5014.

Sincerely yours,

for Gregg M. Worley

Brian L. Beals, Chief
Source Evaluation Unit
Air Enforcement Branch

File Copy

For Routing To Other Than The Addressee

To _____ Location: _____

To _____ Location: _____

To: _____ Location: _____

From: _____ Date: _____

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

TO: Buck Oven

FROM: Bruce Mitchell for

THRU: Preston Lewis

DATE: October 21, 1992

SUBJ: Comments on TECO's proposals to modify the Big Bend Power Station's Coal Yard and to replace some equipment of the North Coal Yard Reclaimer

The following comments regarding the above referenced proposals are:

A. Modification of the Coal Yard

1. For each operation that the potential pollution emissions were calculated in Attachment 4, provide the basis (i.e., lab results, etc.) for the moisture content used (i.e., 15%). In accordance with the literature, the value of 15% is very high and would affect the potential emissions because it is in the denominator of the equation used to estimate the emissions. Since the range for coal moisture is 0.25 - 4.8 (see Table 11.2.3-3., AP-42 Emission Factors), with a mean of 2.3, then the highest acceptable value that should be used is 2.3 (note: worst case would be represented by using 0.25). Therefore, please recalculate the potential pollutant emissions and edit the appropriate table.

2. For each operation that the potential pollution emissions were calculated in Attachment 4, provide and qualify the basis (i.e., vendor specs, test results, use of dust suppressants, etc.) for the dust collection/suppression efficiencies used (i.e., 50 -85%). If it is determined that the projected efficiency is not justifiable, then state and qualify the new value and recalculate the potential pollutant emissions and edit the appropriate table.

3. In Attachment 4, Particulate Matter Emission Calculations, the aerodynamic particle size multiplier that was used is 0.74, which represents an aerodynamic particle size of <30um (see Table 11.2.3-3., AP-42 Emission Factors). Because of the significant rates for particulate matter (PM) and PM_{10}, please calculate the potential pollutant emissions for both PM and PM_{10}.

4. In Attachment 4, Mobile Equipment Operations on Stockpile, the calculations for potential pollutant emissions used an aerodynamic particle size multiplier of 0.80. Referencing #3 above and the calculations in Attachment 4, please explain why this value was used and the discrepancy between the other value (i.e., 0.74) that was used for all other calculations.

5. The introduction states that the operations might be handling limestone material also. Please calculate the potential pollutant emissions expected from the handling and processing of this material; also, include all assumptions, calculations and reference material, used in the projection of the potential pollutant emissions.

6. For the coal silo baghouse control system, it appears that the applicant is requesting a more restrictive emission limiting standard (i.e., 0.02 gr/dscf) than allowed by rule (i.e., F.A.C. Rule 17-2.650(2)(c)11.b.ii.: 0.03 gr/dscf). Please acknowledge if this is correct. Note, the vendor will guarantee 0.01 gr/dscf.

7. The applicant has stated that the visible emission standard for the coal silo baghouse control system should be in accordance with F.A.C. Rule 17-2.610(2)(a), which is "less than 20% opacity" (see Section III. C. of the application). However, the appropriate standard is in accordance with F.A.C. Rule 17-2.650(2)(c)11.b.i., which is "no visible emissions (5% opacity)". Please acknowledge agreement with this or provide an explanation if there is a disagreement.

B. <u>North Coal Yard Reclaimer Equipment Replacement</u>

1. For each operation that the potential pollution emissions were calculated in Attachment 1, provide the basis (i.e., lab results, etc.) for the moisture content used (i.e., 6.5%). In accordance with the literature, the value of 6.5% is considered high and would affect the potential emissions because it is in the denominator of the equation used to estimate the emissions. Since the range for coal moisture is 0.25 - 4.8 (see Table 11.2.3-3., AP-42 Emission Factors), with a mean of 2.3, then the highest acceptable value that should be used is 2.3 (note: worst case would be represented by using 0.25). Therefore, please recalculate the potential pollutant emissions and edit the appropriate table.

2. For each operation that the potential pollution emissions were calculated in Attachment 4, provide and qualify the basis (i.e., vendor specs, test results, use of dust suppressants, etc.) for the dust collection/suppression efficiencies used (i.e., 50 -90%). If it is determined that the projected efficiency is not justifiable, then state and qualify the new value and recalculate the potential pollutant emissions and edit the appropriate table.

3. In Attachment 1, Particulate Matter Emission Calculations, Part A.: Transfer from Pile to Mobile Reclaim Conveyor, a dust control efficiency factor of 0.90 was projected. The calculations used a factor of 0.50. Which value is correct? Whichever it is, please make the appropriate corrections, qualify the value to be used, and recalculate the potential pollutant emissions.

4. Please submit plot plans exhibiting the equipment of the existing operations and the equipment of the proposed future operations.

5. Please describe the existing dust control systems currently in operation and referred to in the brief overviews in Attachment 1.

6 Based on the submittal, the company assumes that the proposed changes of the equipment to the north coal yard pile reclaimer operation is exempt from Department permitting. This decision is based on technical assumptions and calculations, which were not sealed by a Florida registered P.E. Pursuant to F.A.C. Rule 17-4.050, a P.E. is required to sign and seal technical information related to the Department's review of potential air pollution activities and its operation. Therefore, the request package should be signed and sealed by a Florida registered P.E. (see the IM from Mr. John Shearer dated August 14, 1990).

7. Is the "mobile conveyor to the boom conveyor" going to be removed from service? If not, please explain.

8. Will the "yard operations" be handling any aggregates than coal? If yes, please explain in d and provide the calculations of the potential poll emissions expected from the handling of the material. Also, please provide any assumptions reference material.

If there are any questions, please call me at 904-488- Thanks! RBM.

Attachments

BM/rbm

Hand Delivered @ 12:37, 10/21/92 RBM
E-mailed to Buck @ 12:35, 10/21/92 RBM
Preston Lewis
John Brown } 10/21/92 RBM

11.2.3 AGGREGATE HANDLING AND STORAGE PILES

11.2.3.1 General

Inherent in operations that use minerals in aggregate form is the maintenance of outdoor storage piles. Storage piles are usually left uncovered, partially because of the need for frequent material transfer into or out of storage.

Dust emissions occur at several points in the storage cycle, such as during material loading onto the pile, disturbances by strong wind currents, and loadout from the pile. The movement of trucks and loading equipment in the storage pile area is also a substantial source of dust.

11.2.3.2 Emissions And Correction Parameters

The quantity of dust emissions from aggregate storage operations varies with the volume of aggregate passing through the storage cycle. Also, emissions depend on three parameters of the condition of a particular storage pile: age of the pile, moisture content and proportion of aggregate fines.

When freshly processed aggregate is loaded onto a storage pile, its potential for dust emissions is at a maximum. Fines are easily disaggregated and released to the atmosphere upon exposure to air currents, either from aggregate transfer itself or from high winds. As the aggregate weathers, however, potential for dust emissions is greatly reduced. Moisture causes aggregation and cementation of fines to the surfaces of larger particles. Any significant rainfall soaks the interior of the pile, and the drying process is very slow.

Silt (particles equal to or less than 75 microns in diameter) content is determined by measuring the portion of dry aggregate material that passes through a 200 mesh screen, using ASTM-C-136 method. Table 11.2.3-1 summarizes measured silt and moisture values for industrial aggregate materials.

11.2.3.3 Predictive Emission Factor Equations

Total dust emissions from aggregate storage piles are contributions of several distinct source activities within the storage cycle:

1. Loading of aggregate onto storage piles (batch or continuous drop operations).
2. Equipment traffic in storage area.
3. Wind erosion of pile surfaces and ground areas around piles.
4. Loadout of aggregate for shipment or for return to the process stream (batch or continuous drop operations).

Adding aggregate material to a storage pile or removing it both usually involve dropping the material onto a receiving surface. Truck dumping on the pile or loading out from the pile to a truck with a front end loader are examples of batch drop operations. Adding material to the pile by a conveyor stacker is an example of a continuous drop operation.

TABLE 11.2.3-1. TYPICAL SILT AND MOISTURE CONTENT VALUES OF MATERIALS AT VARIOUS INDUSTRIES

Industry	Material	Silt (%)			Moisture (%)		
		No. of test samplers	Range	Mean	No. of test samplers	Range	Mean
Iron and steel production[a]	Pellet ore	10	1.4 - 13	4.9	8	0.64 - 3.5	2.1
	Lump ore	9	2.8 - 19	9.5	6	1.6 - 8.1	5.4
	Coal	7	2 - 7.7	5	6	2.8 - 11	4.8
	Slag	3	3 - 7.3	5.3	3	0.25 - 2.2	0.92
	Flue dust	2	14 - 23	18.0	0	NA	NA
	Coke breeze	1		5.4	1		6.4
	Blended ore	1		15.0	1		6.6
	Sinter	1		0.7	0	NA	NA
	Limestone	1		0.4	0	NA	NA
Stone quarrying and processing[b]	Crushed limestone	2	1.3 - 1.9	1.6	2	0.3 - 1.1	0.7
Taconite mining and processing[c]	Pellets	9	2.2 - 5.4	3.4	7	0.05 - 2.3	0.9
	Tailings	2	NA	11.0	1		0.35
Western surface coal mining[d]	Coal	15	3.4 - 16	6.2	7	2.8 - 20	6.9
	Overburden	15	3.8 - 15	7.5	0	NA	NA
	Exposed ground	3	5.1 - 21	15.0	3	0.8 - 6.4	3.4
Coal fired power generation[e]	Coal	60	0.6 - 4.8	2.2	59	2.7 - 7.4	4.5

[a] References 2-5. NA = not applicable.
[b] Reference 1.
[c] Reference 6.
[d] Reference 7.
[e] Reference 8. Values reflect "as received" conditions of a single power plant.

The quantity of particulate emissions generated by either type of drop operation, per ton of material transferred, may be estimated, with a rating of A, using the following empirical expression[2]:

$$E = k(0.0016) \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (kg/Mg)}$$

$$E = k(0.0032) \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (lb/ton)}$$

where: E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, m/s (mph)
M = material moisture content (%)

The particle size multiplier, k, varies with aerodynamic particle diameter, as shown in Table 11.2.3-2.

TABLE 11.2.3-2. AERODYNAMIC PARTICLE SIZE MULTIPLIER (k)

<30 um	<15 um	<10 um	<5 um	<2.5 um
0.74	0.48	0.35	0.20	0.11

The equation retains the assigned quality rating if applied within the ranges of source conditions that were tested in developing the equation, as given in Table 11.2.3-3. Note that silt content is included in Table 11.2.3-3, even though silt content does not appear as a correction parameter in the equation. While it is reasonable to expect that silt content and emission factors are interrelated, no significant correlation between the two was found during the derivation of the equation, probably because most tests with high silt contents were conducted under lower winds, and vice versa. It is recommended that estimates from the equation be reduced one quality rating level, if the silt content used in a particular application falls outside the range given in Table 11.2.3-3.

TABLE 11.2.3-3. RANGES OF SOURCE CONDITIONS FOR EQUATION 1

Silt Content	Moisture Content	Wind Speed (m/s)	Wind Speed (mph)
0.44 - 19	0.25 - 4.8	0.6 - 6.7	1.3 - 15

Also, to retain the equation's quality rating when applied to a specific facility, it is necessary that reliable correction parameters be determined for the specific sources of interest. The field and laboratory procedures for aggregate sampling are given in Reference 3. In the event that site specific values for correction parameters cannot be obtained, the appropriate mean values from Table 11.2.3-1 may be used, but, in that case, the quality rating of the equation is reduced by one level.

For emissions from equipment traffic (trucks, front end loaders, dozers, etc.) traveling between or on piles, it is recommended that the equations for vehicle traffic on unpaved surfaces be used (see Section 11.2.1). For vehicle travel between storage piles, the silt value(s) for the areas among the piles (which may differ from the silt values for the stored materials) should be used.

Worst case emissions from storage pile areas occur under dry windy conditions. Worst case emissions from materials handling operations may be calculated by substituting into the equation appropriate values for aggregate material moisture content and for anticipated wind speeds during the worst case averaging period, usually 24 hours. The treatment of dry conditions for vehicle traffic (Section 11.2.1), centering on parameter p, follows the methodology described in Section 11.2.1. Also, a separate set of nonclimatic correction parameters and source extent values corresponding to higher than normal storage pile activity may be justified for the worst case averaging period.

11.2.3.4 Controls

Watering and chemical wetting agents are the principal means for control of aggregate storage pile emissions. Enclosure or covering of inactive piles to reduce wind erosion can also reduce emissions. Watering is useful mainly to reduce emissions from vehicle traffic in the storage pile area. Watering of the storage piles themselves typically has only a very temporary slight effect on total emissions. A much more effective technique is to apply chemical wetting agents for better wetting of fines and longer retention of the moisture film. Continuous chemical treatment of material loaded onto piles, coupled with watering or treatment of roadways, can reduce total particulate emissions from aggregate storage operations by up to 90 percent.[9]

References for Section 11.2.3

1. C. Cowherd, Jr., et al., Development Of Emission Factors For Fugitive Dust Sources, EPA-450/3-74-037, U. S. Environmental Protection Agency, Research Triangle Park, NC, June 1974.

2. R. Bohn, et al., Fugitive Emissions From Integrated Iron And Steel Plants, EPA-600/2-78-050, U. S. Environmental Protection Agency, Cincinnati, OH, March 1978.

3. C. Cowherd, Jr., et al., Iron And Steel Plant Open Dust Source Fugitive Emission Evaluation, EPA-600/2-79-103, U. S. Environmental Protection Agency, Cincinnati, OH, May 1979.

4. R. Bohn, Evaluation Of Open Dust Sources In The Vicinity Of Buffalo, New York, EPA Contract No. 68-02-2545, Midwest Research Institute, Kansas City, MO, March 1979.

5. C. Cowherd, Jr., and T. Cuscino, Jr., Fugitive Emissions Evaluation, MRI-4343-L, Midwest Research Institute, Kansas City, MO, February 1977.

6. T. Cuscino, et al., Taconite Mining Fugitive Emissions Study, Minnesota Pollution Control Agency, Roseville, MN, June 1979.

7. K. Axetell and C. Cowherd, Jr., Improved Emission Factors For Fugitive Dust From Western Surface Coal Mining Sources, 2 Volumes, EPA Contract No. 68-03-2924, PEI, Inc., Kansas City, MO, July 1981.

8. E. T. Brookman, et al., Determination of Fugitive Coal Dust Emissions From Rotary Railcar Dumping, 1956-L81-00, TRC, Hartford, CT, May 1984.

9. G. A. Jutze, et al., Investigation Of Fugitive Dust Sources Emissions And Control, EPA-450/3-74-036a, U. S. Environmental Protection Agency, Research Triangle Park, NC, June 1974.

17-4.030 General Prohibition. Any stationary installation which will reasonably be expected to be a source of pollution shall not be operated, maintained, constructed, expanded, or modified without the appropriate and valid permits issued by the Department, unless the source is exempted by Department rule. The Department may issue a permit only after it receives reasonable assurance that the installation will not cause pollution in violation of any of the provisions of Chapter 403, F.S., or the rules promulgated thereunder. A permitted installation may only be operated, maintained, constructed, expanded or modified in a manner that is consistent with the terms of the permit.
Specific Authority: 403.021, 403.031, 403.061, 403.088, F.S.
Law Implemented: 403.021, 403.031, 403.061, 403.087, 403.088, F.S.
History: New 3-4-70, Revised 5-17-72, Amended 8-31-88.
Previously numbered as 17-4.03.

17-4.040 Exemptions.

(1) The following installations are exempted from the permit requirements of this Chapter. The following exemptions do not relieve any installation from any other requirements of Chapter 403., F.S., or rules of the Department. Other installations may be exempted under other Chapters of Title 17.

(a) Structural changes which will not change the quality, nature or quantity of air and water contaminant emissions or discharges or which will not cause pollution.

(b) Any existing or proposed installation which the Department shall determine does not or will not cause the issuance of air or water contaminants in sufficient quantity, with respect to its character, quality or content, and the circumstances surrounding its location, use and operation, as to contribute significantly to the pollution problems within the State, so that the regulation thereof is not reasonably justified. Such a determination is agency action and is subject to Chapter 120, F.S. Such determination shall be made in writing and filed by the Department as a public record. Such determination may be revoked if the installation is substantially modified or the basis for the exemption is determined to be materially incorrect.

(2) These exemptions do not apply to the discharge to waters of the state from any article, machine, equipment, contrivance or their exhaust system, which contains water-borne radioactive material in concentrations above the natural radioactive background concentration in the receiving water.
Specific Authority: 403.061, 403.805, F.S.
Law Implemented: 403.021, 403.031, 403.061, 403.087, 403.088, 403.802, 403.805, 403.813, F.S.
History: Formerly 17-4.03(2), F.A.C.; New 3-4-72; Revised 5-17-72; Amended 8-7-73, 6-10-75, 10-26-75, 7-8-76, 7-13-78, 3-1-79; Joint Administrative Procedures Committee Objection Withdrawn - See FAW Vol. 3, No. 30, 7-29-77; Amended 3-11-81, 7-8-82, 3-31-83, 3-15-84, 12-10-84, 5-8-85, 3-18-86, 8-31-88. Previously numbered as 17-4.04.

17-4.050 Procedure to Obtain Permits; Application.

(1) Any person desiring to obtain a permit from the Department shall apply on forms prescribed by the Department and shall submit such additional information as the Department by law may require.

(2) All applications and supporting documents shall be filed in quadruplicate with the Department.

(3) To ensure protection of public health, safety, and welfare, any construction, modification, or operation of an installation which may be a source of pollution, or of a public drinking water supply, shall be in accordance with sound professional engineering practices pursuant to Chapter 471, F. S.; and all final geological papers or documents involving the practice of the profession of geology shall be in accordance with sound professional geological practices pursuant to Chapter 492, F.S. All applications for a Department permit shall be certified by a professional engineer registered in the State of Florida except when the application is for renewal of an air pollution operation permit at a minor facility as defined in Rule 17-2.100(120), F.A.C., or where professional engineering is not required by Chapter 471, F.S. Where required by Chapter 471 or 492, F.S., applicable portions of permit applications and supporting documents which are submitted to the Department for public record shall be signed and sealed by the professional(s) who prepared or approved them.

(4) Processing fees are as follows:

(a) Air Pollution Source Permits.

1. Construction Permits.

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

October 7, 1992

Mr. Lynn F. Robinson
Tampa electric Company
P.O. Box 111
Tampa, Florida 33601-0111

Re: TECO Big Bend Modification PA 79-12

Dear Mr. Robinson:

The Department of Environmental Regulation has initiated its review of your request for modification of the Big Bend Station's coal yard. Analysis of the air modeling revealed impacts that are well below the significant impact levels for particulate matter for both the annual and 24-hour averaging periods. However, upon reviewing the PSD analysis for Big Bend Unit 4, it was noticed that the predicted maximum annual average TSP concentration exceeded the new particulate matter annual standard for PM_{10} of 50 ug/m^3. There is some concern that the small increase in particulate matter emissions in conjunction with any contemporaneous increases may show violations of the ambient standard. There is also some concern regarding the 24-hour ambient standard. TECO should satisfy the Department that all particulate matter ambient air quality standards are met or that your sources do not significantly contribute to a violation of a standard. It is suggested that you submit a complete and detailed list of all contemporaneous particulate matter emission changes to help resolve this matter.

If you have questions regarding these concerns, you may wish to contact Max Linn at (904) 488-6140.

Sincerely,

Hamilton S. Oven

Hamilton S. Oven, P.E.
Administrator, Siting
Coordination Office

cc: Clair Fancy
Bill Thomas
Max Linn
Jerry Campbell

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

September 25, 1992

Mr. Brian Mitchell, Acting Chief
Policy, Planning and Permit Review Branch
National Park Service-Air Quality Division
Post Office Box 25287
Denver, Colorado 80225

Dear Mr. Mitchell:

RE: TECO Big Bend Modification
Hillsborough County, PSD-FL-040

Enclosed is a request for a modification to the site certification for the Tampa Electric Company Big Bend Power Station coal yard. Please send your completeness comments to the Bureau of Air Regulation by October 16, 1992. The Bureau's FAX number is (904)922-6979.

If you have any questions, please call Bruce Mitchell at (904)488-1344 or Tom Rogers at (904)488-6140 or write to me at th above address.

Sincerely,

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

CHF/pa

cc: H. S. Oven

Enclosures

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

September 24, 1992

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

Dear Ms. Harper:

RE: TECO Big Bend Modification
Hillsborough County, PSD-FL-040

Enclosed is a request for a modification to the site certification for the Tampa Electric Company Big Bend Power Station coal yard. Since this will also necessitate a modification to the PSD permit (PSD-FL-040) originally issued by EPA in 1981, we will handle this request in accordance with the terms of partial delegation for sources subject to the PPSA, unless you advise us otherwise. Please send your completeness comments to the Bureau of Air Regulation by October 16, 1992.

If you have any questions, please call Bruce Mitchell at (904)488-1344 or Tom Rogers at (904)488-6140 or write to me at the above address.

Sincerely,

Patricia A. Adams

for C. H. Fancy
Chief
Bureau of Air Regulation

CHF/pa

cc: H. S. Oven

BIG BEND POWER STATION
NORTH COAL YARD
RECLAIMER REPLACEMENT

Prepared for:

TAMPA ELECTRIC
A TECO ENERGY COMPANY

Tampa, Florida

Prepared by:

ECT
Environmental Consulting & Technology, Inc.

Gainesville, Florida

ECT No. 92213-0100-1100

SEPTEMBER 1992

OVERVIEW

Tampa Electric Company (TEC) is planning to replace the north coal yard reclaimer at the Big Bend Power Station. The existing reclaim system recovers coal with a bucket wheel, which places the coal onto a mobile conveyor. The mobile conveyor transfers the coal onto the reclaimer boom conveyor, which transfers the coal onto conveyor P, and the coal handling system. The replacement reclaim system will recovery coal using existing mobile equipment, which will place the coal into a new fixed hopper. This hopper will drop the coal directly onto the existing reclaimer boom. The coal handling system downstream of the existing reclaimer boom will remain unchanged.

The north yard reclaimer replacement is not a modification under §403.516, Florida Statutes because new like-kind equipment will replace existing equipment. Coal throughput will not be increased. Additionally, the replacement will eliminate one coal transfer, modestly reducing the short- and long-term particulate matter (PM) emission rates for the Big Bend Facility. The calculated emission rates are provided in Tables 1 and 2. Calculation detail is provided in Attachment 1.

Table 1. North Yard Reclaimer Particulate Matter Short-Term Emission Comparisons

Transfer	Emission Rate (g/sec) Existing System	Emission Rate (g/sec) Replacement System
Stockpile to Conveyor	0.23	0.23
Mobile Conveyor to Boom Conveyor	0.23	NA
Boom Conveyor to Conveyor P	0.23	0.23
Total	**0.69**	**0.46**

Note: NA = not applicable.

Source: ECT, 1992.

Table 2. North Yard Reclaimer Particulate Matter Long-Term Emission Comparisons

Transfer	Emission Rate (TPY)	
	Existing System	Replacement System
Stockpile to Conveyor	0.47	0.47
Mobile Conveyor to Boom Conveyor	0.47	NA
Boom Conveyor to Conveyor P	0.47	0.47
Total	**1.41**	**0.94**

Note: NA = not applicable.

Source: ECT, 1992.

ATTACHMENT 1
PARTICULATE MATTER EMISSION CALCULATIONS FOR
MODIFIED NORTH COAL YARD RECLAIMER SOURCES

PART A. EXISTING RECLAIM SYSTEM SOURCES

TRANSFER FROM PILE TO MOBILE RECLAIM CONVEYOR

Coal is transferred from the coal pile to the coal reclaim sub-system using a bucket system to place the coal onto the mobile reclaim conveyor. This transfer is in the open. The existing dust control system provides fugitive dust control. The emission factor for this operation, from AP-42, Section 11.2.3, Aggregate Handling and Storage (EPA, 1991), is:

$$E = [0.0032 \times k \times (u/5)^{1.3}] / (M/2)^{1.4}$$

where: E = emission factor (lb/t);
k = particulate size coefficient (dimensionless) = 0.74;
u = annual average windspeed (mph) = 8.6 mph (NWS meteorological data for Tampa); and
M = moisture content of the coal (%) = 6.5%.

Substituting, the emission factor is:

$$E = [0.0032 \times 0.74 \times (8.6/5)^{1.3}] / (6.5/2)^{1.4};$$
$$E = 0.00092 \ lb/t.$$

The short-term emissions are calculated using the equation:

$$A_s = E \times H \times c_1$$

where: A_s = short-term emissions (lb/hr);
E = emission factor = 0.00092 lb/t;
H = hourly coal transfer = 4,000 t/hr; and
c_1 = dust control efficiency factor = 0.90.

Substituting, the short-term emissions are

$$A_s = 0.00092 \ lb/t \times 4{,}000 \ t/hr \ (1 - 0.50);$$
$$A_s = 1.84 \ lb/hr; \ and$$
$$A_s = 0.23 \ g/sec.$$

The annual emissions are calculated using the equation:

$$A_L = E \times T \times c_1 \times c_2$$

where: A_L = annual emissions (tpy);
E = emission factor = 0.00092 lb/t;
T = annual coal usage = 2,050,000 tpy;
c_1 = dust control efficiency = 0.50; and
c_2 = conversion constant = 1 t/2,000 lb.

Substituting, the annual emissions are

A_L = 0.00092 *lb/t* × 2,050,000 *tpy* × (1 - 0.50) × 1 *t*/2,000 *lb*;
A_L = 0.47 *tpy*; *and*
A_L = 0.014 *g*/sec.

TRANSFER FROM MOBILE RECLAIM CONVEYOR TO NORTH STACKER BOOM CONVEYOR

Coal is transferred from the mobile reclaim conveyor to the north stacker boom conveyor within the reclaim sub-system. This transfer is in the open. The existing dust control system provides fugitive dust control. The emission factor for this operation, from AP-42, Section 11.2.3, Aggregate Handling and Storage (EPA, 1991), is:

$$E = [0.0032 \times k \times (u/5)^{1.3}] / (M/2)^{1.4}$$

where: E = emission factor (lb/t);
k = particulate size coefficient (dimensionless) = 0.74;
u = annual average windspeed (mph) = 8.6 mph (NWS meteorological data for Tampa); and
M = moisture content of the coal (%) = 6.5%.

Substituting, the emission factor is:

E = [0.0032 × 0.74 × (8.6/5)$^{1.3}$] / (6.5/2)$^{1.4}$;
E = 0.00092 *lb/t*.

The short-term emissions are calculated using the equation:

$$A_s = E \times H \times (1 - c_1)$$

where: A_S = short-term emissions (lb/hr);
E = emission factor = 0.00092 lb/t;
H = hourly coal transfer = 4,000 t/hr; and
c_1 = dust control efficiency factor = 0.50.

Substituting, the short-term emissions are

$$A_s = 0.00092\ lb/t \times 4{,}000\ t/hr\ (1 - 0.50);$$
$$A_s = 1.84\ lb/hr;\ and$$
$$A_s = 0.23\ g/sec.$$

The annual emissions are calculated using the equation:

$$A_L = E \times T \times (1 - c_1) \times c_2$$

where: A_L = annual emissions (tpy);
E = emission factor = 0.00092 lb/t;
T = annual coal usage = 2,050,000 tpy;
c_1 = dust control efficiency factor = 0.50; and
c_2 = conversion constant = 1 t/2,000 lb.

Substituting, the annual emissions are

$$A_L = 0.00092\ lb/t \times 2{,}050{,}000\ tpy \times (1 - 0.50) \times 1\ t/2{,}000\ lb;$$
$$A_L = 0.47\ tpy;\ and$$
$$A_L = 0.014\ g/sec.$$

TRANSFER FROM NORTH STACKER BOOM CONVEYOR TO CONVEYOR P

Coal is transferred from the north stacker boom conveyor to conveyor P within the reclaim sub-system. This transfer is in the open. The existing dust control system provides fugitive dust control. The emission factor for this operation, from AP-42, Section 11.2.3, Aggregate Handling and Storage (EPA, 1991), is:

$$E = [0.0032 \times k \times (u/5)^{1.3}] / (M/2)^{1.4}$$

where: E = emission factor (lb/t);
k = particulate size coefficient (dimensionless) = 0.74;
u = annual average windspeed (mph) = 8.6 mph (NWS meteorological data for Tampa); and
M = moisture content of the coal (%) = 6.5%.

Substituting, the emission factor is:

$$E = [0.0032 \times 0.74 \times (8.6/5)^{1.3}] / (6.5/2)^{1.4};$$
$$E = 0.00092 \ lb/t.$$

The short-term emissions are calculated using the equation:

$$A_s = E \times H \times (1 - c_1)$$

where: A_S = short-term emissions (lb/hr);
E = emission factor = 0.00092 lb/t;
H = hourly coal transfer = 4,000 t/hr; and
c_1 = dust control efficiency factor = 0.50.

Substituting, the short-term emissions are

$$A_s = 0.00092 \ lb/t \times 4{,}000 \ t/hr \ (1 - 0.50);$$
$$A_s = 1.84 \ lb/hr; \ and$$
$$A_s = 0.23 \ g/sec.$$

The annual emissions are calculated using the equation:

$$A_L = E \times T \times (1 - c_1) \times c_2$$

where: A_L = annual emissions (tpy);
E = emission factor = 0.00092 lb/t;
T = annual coal usage = 2,050,000 tpy;
c_1 = dust control efficiency factor = 0.50; and
c_2 = conversion constant = 1 t/2,000 lb.

Substituting, the annual emissions are

A_L = 0.00092 *lb/t* × 2,050,000 *tpy* × (1 - 0.50) × 1 *t*/2,000 *lb*;
A_L = 0.47 *tpy*; *and*
A_L = 0.014 *g*/sec.

PART B. REPLACEMENT RECLAIM SYSTEM SOURCES

TRANSFER FROM PILE TO NORTH STACKER BOOM CONVEYOR

Coal will be transferred from the coal pile to the north stacker boom conveyor within the reclaim sub-system using mobile equipment to place the coal into an above-grade hopper. This transfer will be in the open. The existing dust control system will provide fugitive dust control. The emission factor for this operation, from AP-42, Section 11.2.3, Aggregate Handling and Storage (EPA, 1991), is:

$$E = [0.0032 \times k \times (u/5)^{1.3}] / (M/2)^{1.4}$$

where: E = emission factor (lb/t);
k = particulate size coefficient (dimensionless) = 0.74;
u = annual average windspeed (mph) = 8.6 mph (NWS meteorological data for Tampa); and
M = moisture content of the coal (%) = 6.5%.

Substituting, the emission factor is:

E = [0.0032 × 0.74 × (8.6/5)$^{1.3}$] / (6.5/2)$^{1.4}$;
E = 0.00092 *lb/t*.

The short-term emissions are calculated using the equation:

$$A_S = E \times H \times (1 - c_f)$$

where: A_S = short-term emissions (lb/hr);
E = emission factor = 0.00092 lb/t;
H = hourly coal transfer = 4,000 t/hr; and
c_f = dust control efficiency factor = 0.50.

Substituting, the short-term emissions are:

A_s = 0.00092 *lb/t* × 4,000 *t/hr* (1 - 0.50);
A_s = 1.84 *lb/hr; and*
A_s = 0.23 *g/sec.*

The annual emissions are calculated using the equation:

$$A_L = E \times T \times (1 - c_1) \times c_2$$

where: A_L = annual emissions (tpy);
E = emission factor = 0.00092 lb/t;
T = annual coal usage = 2,050,000 tpy;
c_1 = dust control efficiency factor = 0.50; and
c_2 = conversion constant = 1 t/2,000 lb.

Substituting, the annual emissions are

A_L = 0.00092 *lb/t* × 2,050,000 *tpy* × (1 - 0.50) × 1 *t*/2,000 *lb;*
A_L = 0.47 *tpy; and*
A_L = 0.014 *g/sec.*

TRANSFER FROM NORTH STACKER BOOM CONVEYOR TO CONVEYOR P

Coal will be transferred from the north stacker boom conveyor to conveyor P within the reclaim sub-system. This transfer will be in the open. The existing dust control system will provide fugitive dust control. The emission factor for this operation, from AP-42, Section 11.2.3, Aggregate Handling and Storage (EPA, 1991), is:

$$E = [0.0032 \times k \times (u/5)^{1.3}] / (M/2)^{1.4}$$

where: E = emission factor (lb/t);
k = particulate size coefficient (dimensionless) = 0.74;
u = annual average windspeed (mph) = 8.6 mph (NWS meteorological data for Tampa); and
M = moisture content of the coal (%) = 6.5%.

Substituting, the emission factor is:

$$E = [0.0032 \times 0.74 \times (8.6/5)^{1.3}] / (6.5/2)^{1.4};$$
$$E = 0.00092 \ lb/t.$$

The short-term emissions are calculated using the equation:

$$A_s = E \times H \times (1 - c_1)$$

where: A_S = short-term emissions (lb/hr);
E = emission factor = 0.00092 lb/t;
H = hourly coal transfer = 4,000 t/hr; and
c_1 = dust control efficiency factor = 0.50.

Substituting, the short-term emissions are:

$$A_s = 0.00092 \ lb/t \times 4{,}000 \ t/hr \ (1 - 0.50);$$
$$A_s = 1.84 \ lb/hr; \ and$$
$$A_s = 0.23 \ g/sec.$$

The annual emissions are calculated using the equation:

$$A_L = E \times T \times (1 - c_1) \times c_2$$

where: A_L = annual emissions (tpy);
E = emission factor = 0.00092 lb/t;
T = annual coal usage = 2,050,000 tpy;
c_1 = dust control efficiency factor = 0.50; and
c_2 = conversion constant = 1 t/2,000 lb.

Substituting, the annual emissions are

$$A_L = 0.00092 \ lb/t \times 2{,}050{,}000 \ tpy \times (1 - 0.50) \times 1 \ t/2{,}000 \ lb;$$
$$A_L = 0.47 \ tpy; \ and$$
$$A_L = 0.014 \ g/sec.$$