JACKSONVILLE ELECTRIC AUTHORITY
P. O. BOX 53015
233 W. DUVAL STREET
JACKSONVILLE, FL 32201

SJRCTENV-86-20

May 15, 1986

Mr. Hamilton S. Oven, Jr., P.E.
Administrator of Power Plant Siting
Fla. Dept. of Env. Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301-8241

Dear Mr. Oven:

Subject: SJRPP/SJRCT, Amendment to SCA/EID Table 3.8-3
Fugitive Emission & Control Summary

In accordance with the Florida Power Plant Siting Act, Part II, Chapter 403, Florida Statutes, the Jacksonville Electric Authority (JEA) has previously been granted certification for the location, construction, and operation of the St. Johns River Power Park Units 1 and 2, and its associated facilities including a coal unloading facility and transmision lines.

The present design of the St. Johns River Coal Terminal, includes a 3.2 mile overland, fully enclosed conveyor system to transport coal to the Power Park, and the addition of equipment for coal blending capability within the existing Power Park coal stockyard. Thus, it has become necessary to amend Table 3.8-3 of the Site Certification Application/Environmental Information Document (SCA/EID). Table 3.8-3 provides the fugitive dust control techniques and the expected fugitive emission rates from the various sources associated with the Power Park and St. Johns River Coal Terminal.

This submittal request is being made in accordance with Condition of Certification XXVII, which requires JEA to notify the Department of such SCA/EID amendments. It is our understanding that notice of the SCA/EID amendment must be provided to all parties to the certification proceeding and will be handled by the Department's counsel. We request that copies of all such noticing documents be sent to Mr. William Preston (Hopping Boyd Green & Sams), JEA's counsel. Please let me know if I or Mr Preston can be of any assistance in giving the required notices.

If you have any questions or require additional information, please contact Athena Tsengas at (904) 633-4517.

Sincerely,

Richard Breitmoser (AT)

Richard Breitmoser
Division Chief
Research & Environmental
Affairs Division

RB:AT:mm

cc: w. Preston (HBG&S) w/Attachment

Attachment: Figure 3.8-3 (Revision 2) - Fugitive Emission & Control Summary

Table 3.8-3 (Revision 2)
**Fugitive Emissions and Control Summary**

| Process | | Type | Amount | Factor | Control | Technique | Emissions (Grams/Sec) |
|---|---|---|---|---|---|---|---|
| 1 | Ship Unloading* | 2 Grab Buckets | 2,200 Tons/hr | 0.0016 lb/Ton+ | 70.0% | Suppression, Enclosure | 0.13 |
| 2 | Feeders to Conveyor A* | 2 Points | 2,200 Tons/hr | 0.00039 lb/Ton | 85.0% | Suppression, Enclosure | 0.02 |
| 3 | Conveyor Transfers, 1 and 2* | 2 Points | 2,200 Tons/hr | 0.00087 lb/Ton** | 85.0% | Suppression Enclosure | 0.07 |
| 4 | Conveyor Transfers 3, 4, 5 and D to D by-pass* | 4 Points | 2,200 Tons/hr | 0.00118 lb/Ton** | 75.0% | Enclosure, Conditioned Material | 0.33 |
| 5 | Conveyor Transfers 6 and 7* | 2 Points | 2,000 Tons/hr | 0.00106 lb/Ton** | 75.0% | Enclosure, Conditioned Material | 0.13 |
| 6 | Traveling Stacker* | 3 Points: | | | | | |
| | | 1 Point | 2,200 Tons/hr | 0.00031 lb/Ton | 75.0% | Enclosure, Conditioned Material | 0.02 |
| | | 1 Point | 2,200 Tons/hr | 0.00039 lb/Ton | 75.0% | Enclosure, Conditioned Material | 0.03 |
| | | 1 Point | 2,200 Tons/hr | 0.00017 lb/Ton | 0.0% | | 0.05 |
| 7 | Bucket Wheel Reclaimer* | 2 Points | 2,000 Tons/hr | 0.00063 lb/Ton** | 75.0% | Enclosure, Conditioned Material | 0.08 |
| 8 | Ship-Unloading Facility Coal Surge Pile | Active | 30 Acres | 13 lb/Acre/day[a] | (90%)[a] | Wetting Agent | 0.20 |
| 9 | Coal Handling Transfer Points Ship Unloading Facility Coal Pile* | 8 Points | 2,200 Tons/Hr. | 0.00041 lbs/Ton** | 75.0% | Enclosure, Conditioned Material | 0.23 |
| 10 | Rail Car Unloading | Rotary Dumper | 10,000 Tons/Day | 0.4 lb/Ton[a] | (97%)[b] | Wet Suppression | 0.63 |
| 11 | Coal Handling Transfer Points | 2 Points | 10,000 Tons/Day | 0.2 lb/Ton[c] | (99.9%)[b] | Dry Collection | 0.02 |
| 12 | Coal Handling Transfer Points | 2 Points | 3,300 Tons/Day | 0.2 lb/Ton[c] | (99.9%)[b] | Dry Collection | 0.01 |
| 13 | Coal Handling Transfer Points | 6 Points | 3,300 Tons/Day | 0.2 lb/Ton[c] | (97%)[b] | Wet Suppression | 0.62 |
| 14 | Coal Handling Transfer Points | 7 Points | 5,000 Tons/Day | 0.2 lb/Ton[c] | (99.9%)[b] | Dry Collection | 0.04 |
| 15 | Coal Storage At Plant* | Active | 10 Acres | 13 lb/Acre/day[a] | (90%)[a] | Wetting Agent | 0.07 |
| 16 | Coal Storage At Plant* | 2 Inactive Piles | 13 Acres | 3.5 lb/Acre/day[a] | (99%)[a] | Wetting Agent | 0.002 |
| 17 | Limestone Unloading | Rail Dumper | 750 Tons/Day | 0.4 lb/ton[a] | (97%)[b] | Wet Suppression | 0.05 |
| 18 | Limestone Transfer | 1 Point | 750 Tons/Day | 0.2 lb/Ton[a] | (99.9%)[b] | Dry Collection | 0.001 |
| 19 | Cooling Towers | Drift | 2 x 243,500 gal/min | 51,450 ppm solids (maximum) (40% < 50 microns diameter) | 99.998% | Drift Elimination | 12.66 |
| 20 | Solid Waste Disposal Area | Active | 10 Acres | 13 lb/Acre/day[a] | (90%)[a] | Wetting Agent | 0.07 |

* Revised process or emissions, May 1986.
\+ Weighted average based on 1,500 and 700 STPH ship unloaders.
** Average of emission factors for individual sources.

a. Pedco, 1977.
b. Stoughton, 1980.
c. EPA, 1979.

SJRCTENV 86-18

JACKSONVILLE ELECTRIC AUTHORITY
P. O. BOX 53015
233 W. DUVAL STREET
JACKSONVILLE, FL 32201

May 12, 1986

Mr. Bruce Miller
Acting Chief
Air Programs Branch
U.S. EPA - Region IV
345 Courtland Street, N. E.
Atlanta, Georgia 30365

Dear Mr. Miller:

Subject: Jacksonville Electric Authority
PSD Permit No. PSD-FL-010, Revision Request
St. Johns River Power Park and the
St. Johns River Coal Terminal

In accordance with the Florida Power Plant Siting Act, Part II, Chapter 403, Florida Statutes, the Jacksonville Electric Authority (JEA) has previously been granted certification for the location, construction, and operation of the St. Johns River Power Park Units 1 and 2, and its associated facilities including a coal unloading facility.

This Certification Order, issued on June 29, 1986 also addresses the construction and operation of a conveyor system to transport coal from the coal unloading facility, the St. Johns River Coal Terminal, on the south side of Blount Island to the main plant site.

On March 12, 1982, the United States Environmental Protection Agency, Region IV, issued permit number PSD-FL-010 to the JEA for the construction of the St. Johns River Power Park and St. Johns River Coal Terminal under the rules for the Prevention of Significant Deterioration of Air Quality. This permit was based on rail delivery of coal from St. Johns River Coal Terminal to the St. Johns River Power Park. The present coal unloading facility design includes a 3.2 mile overland, fully enclosed conveyor system to transport coal to the Power Park, in lieu of a railcar system. In addition, additional equipment for coal blending capability within the existing Power Park coal stockyard has been included in the design. JEA is requesting a revision of the existing PSD permit to incorporate these design changes.

Enclosed is a copy of the report containing particulate emission estimates for the coal terminal modifications, and additions to the Power Park coal handling system to enhance coal blending.

Appendix C of the report contains requested revisions to Tables 2 and 6 of the existing PSD permit. Emission estimates have only been revised for those sources which have been changed by the coal terminal design modifications and blending additions.

(CONT.)

Please contact Ms. Athena Tsengas at (904) 633-4517 if you have any questions or require additional information.

Very truly yours,

Richard Breitmoser, P.E.
Division Chief
Research & Environmental
Affairs Division

RB/AJT/lwr

cc: H. S. Oven, Jr. (FDER)
T. Bisterfeld (EPA) - w/o atta.

Attachment: Estimation of Particulate Emissions: St. Johns River Coal Terminal and Blending Additions at the St. Johns River Power Park

# ESTIMATION OF PARTICULATE EMISSIONS:
# ST. JOHNS RIVER COAL TERMINAL
# AND BLENDING ADDITIONS AT
# ST. JOHNS RIVER POWER PARK

Jacksonville Electric Authority

May, 1986

0357b, 5786AM

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## LIST OF FIGURES

# 1.0 INTRODUCTION

This analysis has been prepared by Soros Associates to support the request for a modification of the existing Prevention of Significant Deterioration (PSD) Permit (PSD-FL-010) issued by EPA on March 12, 1982 for the St. Johns River Power Park (SJRPP) and its ancillary facilities. These modifications are necessary because of design changes since the issuance of the existing permit. These design changes affect the St. Johns River Coal Terminal (SJRCT) and the coal handling system at the Power Park. These changes have resulted from the following two design modifications: a conveyor belt system to transport coal from the SJRCT to the Power Park in lieu of rail car conveyance of coal, and enhancement of coal blending capability within the boundaries of the Power Park.

In this report, particulate emissions are estimated for the coal terminal and additions to the Power Park coal handling system to enhance coal blending. These estimates are based on the design and control equipment for those emission sources which have changed from those described in the original PSD permit. Emissions are estimated using the latest available emission factors accepted and recommended by the U.S. Environmental Protection Agency (EPA). This analysis only includes particulate emission estimates for sources which are being modified.

# 2.0 OVERVIEW OF THE EQUIPMENT AND DUST CONTROL MEASURES

## 2.1 BACKGROUND

At the time that the existing PSD permit was reviewed and issued, the proposed means of conveying coal from the St. Johns River Coal Terminal (SJRCT) to the Power Park was a shuttle train service. The present SJRCT design includes a fully enclosed conveyor system to transport the coal, in lieu of the shuttle train. In addition, the interface between the overland conveyor system and the existing coal handling system at the Power Park has been designed to enhance coal blending capability within the existing coal stockyard.

Drawing 94120-02B provides a plan view of the overland conveyor system. Drawing 94120-08B shows design details of the interface between the overland conveyor system and the existing coal handling system to enhance coal blending. Drawing 94120-11B is the schematic material flow diagram, and Drawing 94120-12B shows the proposed dust control measures schematically.

The air pollutant which will be generated by the St. Johns River Coal Terminal (SJRCT) and the additions to the Power Park's coal handling system to enhance coal blending capability, is particulate matter (PM). Fugitive emissions are defined by EPA as those emissions which do not pass through a stack, chimney, vent, or other functionally equivalent opening. Therefore, the emissions from the sources in this project are considered "fugitive". This material becomes airborne when air is mixed with small particles of coal during handling operations. The particulate material is denser than air, and larger particulates quickly settle out of the atmosphere over time and distance. However, dust must still be controlled before it becomes an environmental nuisance. In this case, the dust is to be controlled by means of containment and suppression. These two technologies will result in controlled emission levels fully consistent with the existing PSD Permit.

The equipment applicable to the facilities above are:

- Ship Unloaders
- Conveyors
- Conveyor Transfers
- Traveling Stacker
- Bucket Wheel Reclaimer

Some of this equipment represents a modification to the design which is licensed in the existing PSD permit.

## 2.2 SHIP UNLOADERS

The ultimate phase of the project will require two ship unloaders. During the initial phase, one ship unloader having the free digging capacity of unloading coal at 1,500 short tons per hour (STPH) will be used; the second phase will require a ship unloader with a free digging capacity of unloading coal at 700 STPH. Thus, a maximum of approximately 2,200 STPH of coal could be unloaded by the two ship unloaders. As indicated in the existing PSD Permit, this report is based on two grab bucket unloaders.

Dust emissions from the ship unloaders are to be controlled by means of (1) a drip plate to catch material which may fall from the grab bucket before discharge, (2) wind guards at the receiving hopper to form an enclosure, (3) spray headers around the hopper opening to suppress any escaping dust, and (4) spray headers at the belt feeder transfers below the receiving hopper. These sprays, as well as the other sprays throughout the facility, will be fed a mixture of water and a chemical additive "wetting agent." The "wetting agent" enhances the control provided by the sprays.

In Appendix C, the emissions from ship unloaders and associated coal transfer operations are included in the tables as follows:

Table 2:
- o Process No. 1--Ship Unloading (2 Grab Buckets).
- o Process No. 2--Feeders to Conveyor A (2 points).

Table 6:
- o Emission Unit No. 4--Ship Unloading (2 Grab Buckets).
- o Emission Unit No. 5--Feeders to Conveyor A (2 points).

## 2.3 CONVEYORS

The overland conveyor system consists of Conveyors A, B, C and D. Conveyors E and F have been added to the existing coal handling system at the Power Park to enhance coal blending.

The belt conveyors will be provided with continuous hood covers (except as noted in the following paragraph) which will extend below the return side of the conveyor belt and enclose it in all directions, i.e., "total enclosure." Belts will be scraped and/or plowed at the ends of the runs to remove residual dust from the return belt strand.

Where the tops of Conveyors A and D must remain open to receive or discharge material, such as along the ship unloader travel and the segments along which the stacker and reclaimer travel, there will be wind guards on each side of the belt. Where Conveyor C crosses Blount Island Boulevard and Heckscher Drive, it will be enclosed within a full gallery structure so that any equipment dropped by personnel on the walkways does not fall onto the road below.

The return strands on Conveyors B and C will be turned over at the terminals so that the dirty side of the return strand is turned up, to minimize material drop-off along the return run and reduce maintenance cleanup within the total enclosure.

## 2.4 CONVEYOR TRANSFERS

Coal dust emissions at conveyor transfers are to be controlled by fully enclosing the transfers and spraying at selected transfers. Enclosures at conveyor transfers will be chutes with skirtboards, dust curtains, and other dust seals that fully enclose the material transfers.

Sprays will be located within the chutes at the following transfers:

1. Transfer Station No. 1 (Conveyor A to Conveyor B)
2. Transfer Station No. 2 (Conveyor B to Conveyor C)

Sprays will not be provided at the remaining transfer stations because the water and "wetting agent" provided at the spray points upstream will increase the moisture content and condition the coal sufficiently to control dust generation at the downstream transfers not equipped with sprays, which will be fully enclosed in any case.

All conveyor transfers and enclosures along conveyor belts will be cleaned regularly with the vacuum system described in Section 2.7.

In Appendix C, the remaining conveyor transfers are identified in the tables as follows:

Table 2:
- o Process No. 3--Conveyor Transfers 1 and 2 (2 points).
- o Process No. 4--Conveyor Transfers 3, 4, 5 and D to D by-pass (4 points).
- o Process No. 5 -- Conveyor Transfers 6 and 7 (2 points).

Table 6:
- o Emission Unit No. 6--Conveyor Transfers 1 and 2 (2 points).
- o Emission Unit No. 7--Conveyor Transfers 3, 4, 5 and D to D by-pass (4 points).
- o Emission Unit No. 8--Conveyor Transfers 6 and 7 (2 points).

## 2.5 TRAVELING STACKER

Coal arriving at the Power Park from the overland conveyor system may be placed into storage at the Power Park with a travelling stacker. Alternatively, coal can by-pass the stacker and be placed directly on the existing coal handling system at the Power Park, via conveyors D and E.

Internal transfers within the stacker will be enclosed, and the boom conveyor on the stacker will be provided with a hood cover. The machine has a luffing capability so that the drop height from the head pulley of the boom conveyor to the stockpile will be minimized at all times.

In Appendix C, the traveling stacker is included in the tables as follows:

Table 2: o Process No. 6--Traveling Stacker (3 points).

Table 6: o Emission Unit No. 9--Traveling Stacker (3 points).

## 2.6 BUCKET WHEEL RECLAIMER

To enhance blending capability, a bucket wheel reclaimer will be provided. Coal reclaimed by the bucket wheel reclaimer will discharge to Conveyor D. The boom conveyor on the reclaimer will be provided with a hood cover, and internal transfers will be enclosed.

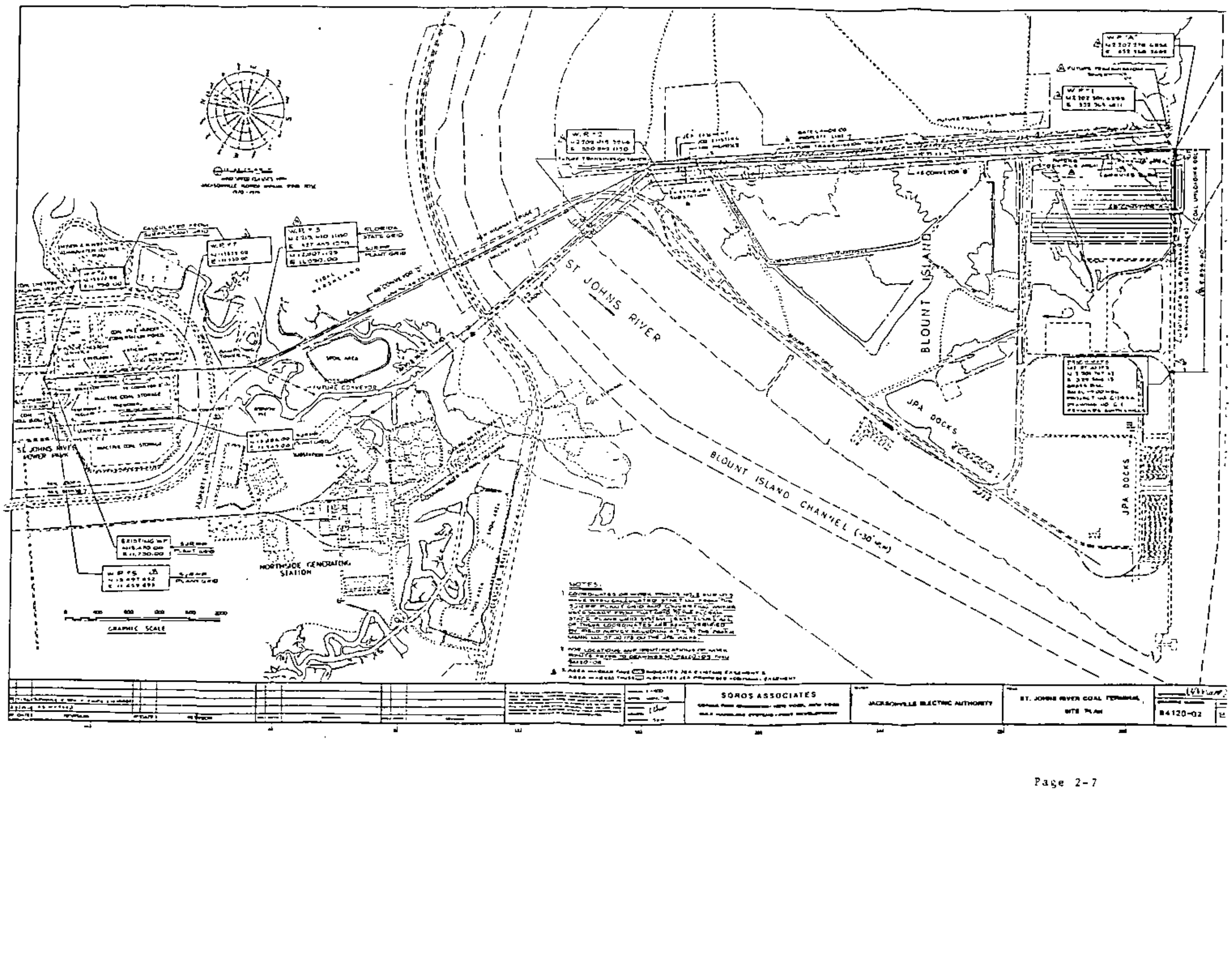
In Appendix C, the emission from the bucket wheel reclaimer is included in the tables as follows:

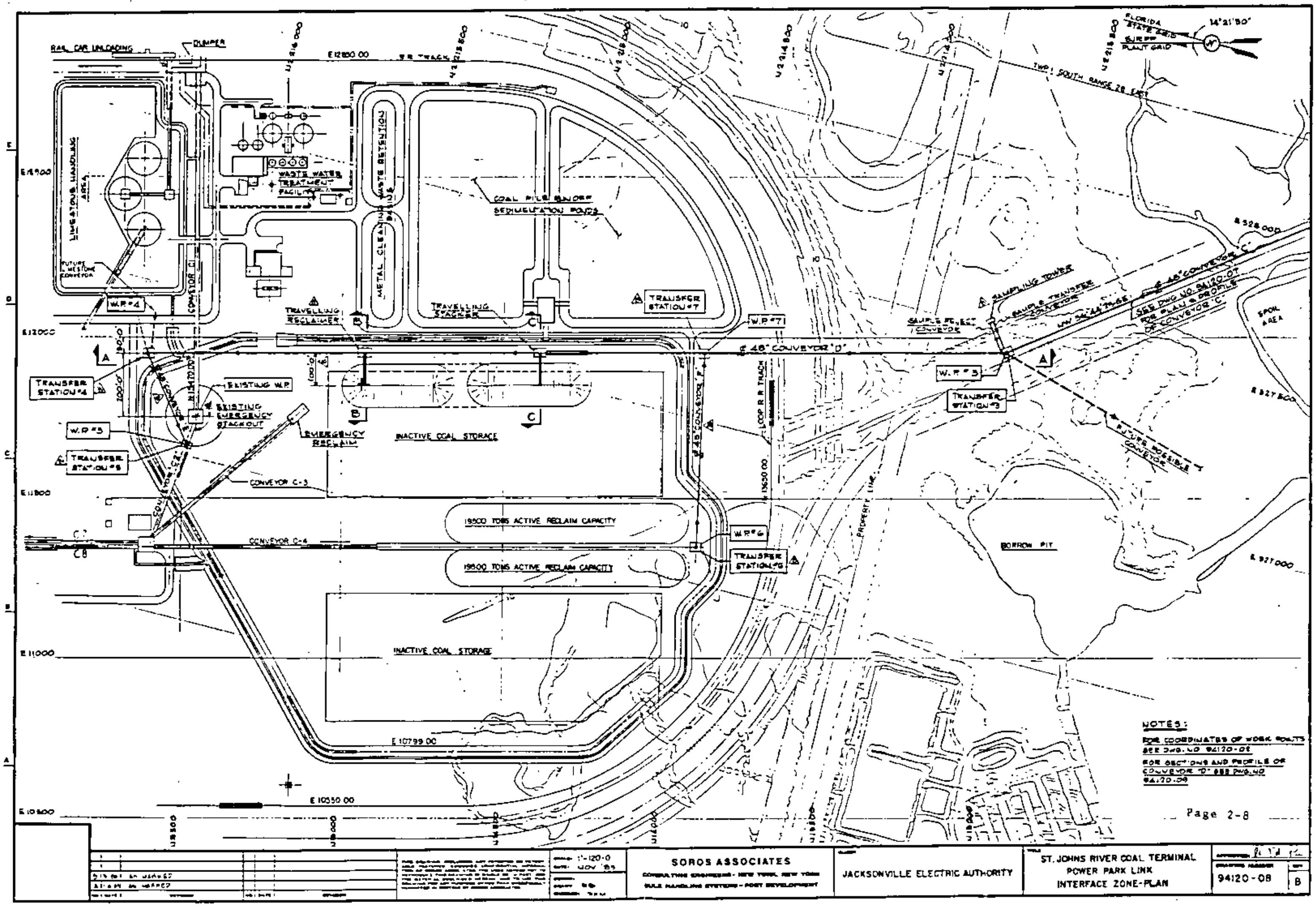
Table 2: o Process No. 7--Bucket Wheel Reclaimer (2 points).

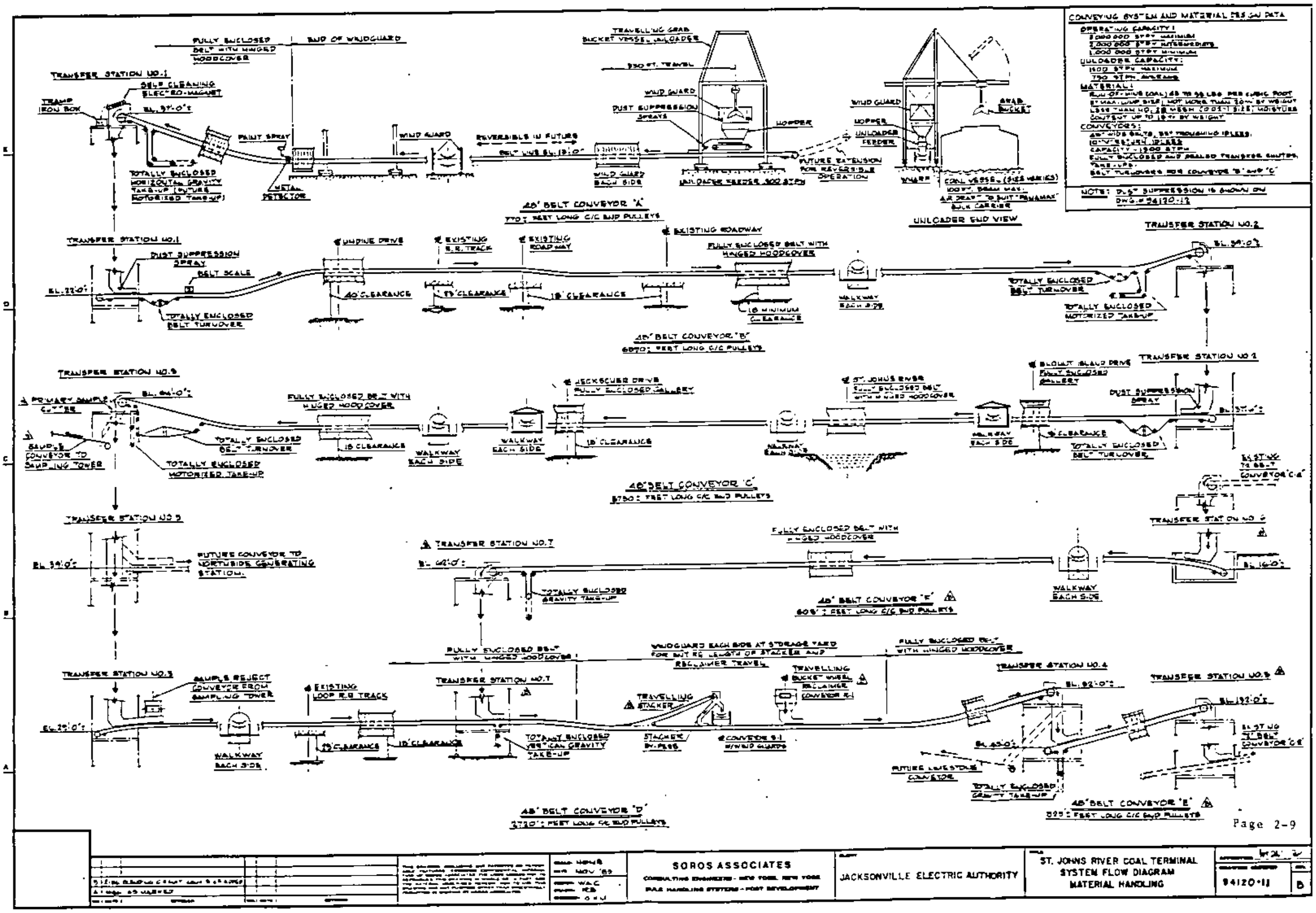
Table 6: o Emission Unit No. 10--Bucket Wheel Reclaimer (2 points).

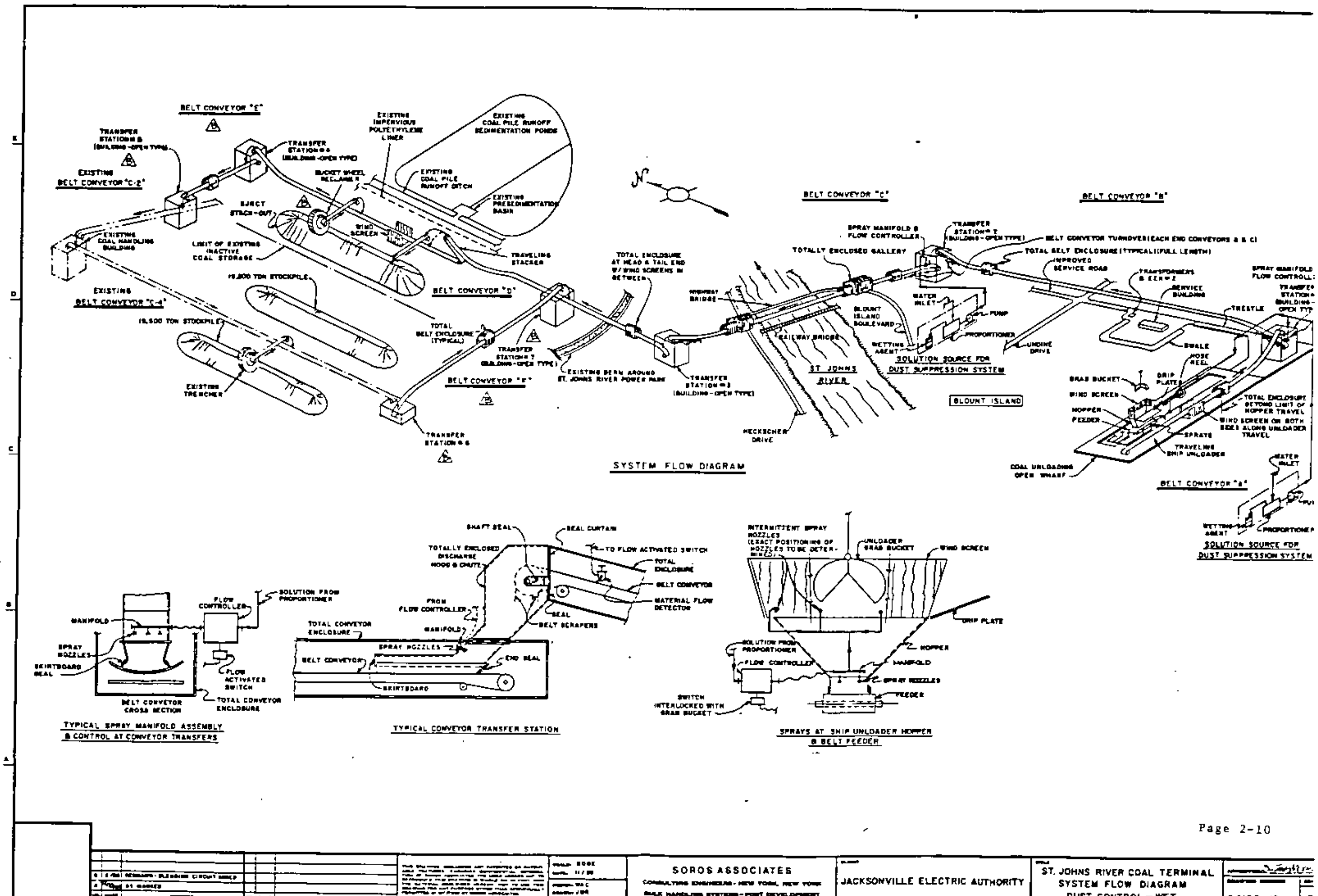
## 2.7 VACUUM CLEANUP SYSTEM

A vacuum cleanup system will be provided at transfer stations and along belt runs. The system will be powered by a mobile vacuum unit which would also be available for general cleanup purposes.


ST JOHNS RIVER
BLOUNT ISLAND
BLOUNT ISLAND CHANNEL
JPA DOCKS
JPA DOCKS
NORTHSIDE GENERATING STATION
ST. JOHNS RIVER POWER PARK
SPOIL AREA
FUTURE CONVEYOR
GRAPHIC SCALE
NOTES:
SOROS ASSOCIATES
JACKSONVILLE ELECTRIC AUTHORITY
84120-02


RAIL CAR UNLOADING
DUMPER
E 12850.00
LIMESTONE HANDLING AREA
WASTE WATER TREATMENT FACILITY
METAL CLEANING WASTE RETENTION BASINS
COAL PILE RUNOFF SEDIMENTATION PONDS
FUTURE LIMESTONE CONVEYOR
W.P.#4
TRAVELLING RECLAIMER
TRAVELLING STACKER
TRANSFER STATION #7
W.P.#7
48" CONVEYOR "D"
TRANSFER STATION #4
EXISTING W.P.
EXISTING EMERGENCY STACKOUT
W.P.#5
TRANSFER STATION #5
EMERGENCY RECLAIM
INACTIVE COAL STORAGE
CONVEYOR C-3
CONVEYOR C-4
C7
C8
19500 TONS ACTIVE RECLAIM CAPACITY
W.P.#6
TRANSFER STATION #6
LOOP R.R. TRACK
PROPERTY LINE
SAMPLING TOWER
SAMPLE TRANSFER CONVEYOR
SAMPLE REJECT CONVEYOR
48" CONVEYOR "C"
SEE DWG NO. 94120-07 FOR PLAN & PROFILE OF CONVEYOR "C"
W.P.#3
TRANSFER STATION #3
FUTURE POSSIBLE CONVEYOR
SPOIL AREA
BORROW PIT
FLORIDA STATE GRID
PLANT GRID
14°21'50"
TWP 1 SOUTH RANGE 28 EAST
E 10799.00
E 10550.00
NOTES:
FOR COORDINATES OF WORK POINTS SEE DWG. NO 94120-05
FOR SECTIONS AND PROFILE OF CONVEYOR "D" SEE DWG. NO 94120-09
SOROS ASSOCIATES
JACKSONVILLE ELECTRIC AUTHORITY
ST. JOHNS RIVER COAL TERMINAL
POWER PARK LINK
INTERFACE ZONE-PLAN
94120-08
B


CONVEYING SYSTEM AND MATERIAL DESIGN DATA
OPERATING CAPACITY:
3,000,000 STPY MAXIMUM
2,000,000 STPY INTERMEDIATE
1,000,000 STPY MINIMUM
UNLOADER CAPACITY:
1500 STPH MAXIMUM
750 STPH AVERAGE
MATERIAL:
CONVEYORS:
CAPACITY - 1500 STPH
NOTE: DUST SUPPRESSION IS SHOWN ON DWG. # 94120-12
TRANSFER STATION NO. 1
TRANSFER STATION NO. 2
TRANSFER STATION NO. 3
TRANSFER STATION NO. 4
TRANSFER STATION NO. 5
TRANSFER STATION NO. 6
TRANSFER STATION NO. 7
UNLOADER END VIEW
48" BELT CONVEYOR 'A'
48" BELT CONVEYOR 'B'
48" BELT CONVEYOR 'C'
48" BELT CONVEYOR 'D'
48" BELT CONVEYOR 'E'
48" BELT CONVEYOR 'F'
WALKWAY EACH SIDE
TOTALLY ENCLOSED BELT TURNOVER
TOTALLY ENCLOSED MOTORIZED TAKE-UP
FULLY ENCLOSED BELT WITH HINGED HOODCOVER
FUTURE LIMESTONE CONVEYOR
SOROS ASSOCIATES
JACKSONVILLE ELECTRIC AUTHORITY
ST. JOHNS RIVER COAL TERMINAL
SYSTEM FLOW DIAGRAM
MATERIAL HANDLING
94120-11
B



BELT CONVEYOR "E"
EXISTING BELT CONVEYOR "C-2"
EXISTING BELT CONVEYOR "C-4"
BELT CONVEYOR "D"
BELT CONVEYOR "F"
BELT CONVEYOR "C"
BELT CONVEYOR "B"
BELT CONVEYOR "A"
ST. JOHNS RIVER
BLOUNT ISLAND
SOLUTION SOURCE FOR DUST SUPPRESSION SYSTEM
SYSTEM FLOW DIAGRAM
TYPICAL SPRAY MANIFOLD ASSEMBLY & CONTROL AT CONVEYOR TRANSFERS
TYPICAL CONVEYOR TRANSFER STATION
SPRAYS AT SHIP UNLOADER HOPPER & BELT FEEDER
SOROS ASSOCIATES
JACKSONVILLE ELECTRIC AUTHORITY
ST. JOHNS RIVER COAL TERMINAL
SYSTEM FLOW DIAGRAM
DUST CONTROL - WET
94120-12

## 3.0 ESTIMATION OF PARTICULATE EMISSIONS

The equations and parameters used in developing the suspended particulate emission factors for the coal terminal and blending additions are presented in Table 3-1. These equations were obtained from EPA "Compilation of Air Pollutant Emission Factors", Supplements 1-15, commonly known as AP-42 (see Appendix A for excerpts from AP-42).

These emission factors were used since they are the most recent factors that are acceptable to and recommended by EPA for quantifying fugitive dust emissions for the sources that are proposed in this project. For those sources which are not affected by the design modifications, the emission factors used for estimating the fugitive dust emissions were not changed.

The estimated emissions of suspended particulates from the coal terminal and blending additions are presented in Table 3-2. The batch drop equation applies to the batch transfer of material from the grab bucket to the ship unloader receiving hopper. The continuous drop equation applies to the other affected operations in which coal is transferred to or from the conveyors or from one conveyor to another in a continuous flow.

Not shown in Table 3-2 is the change in emissions from the coal storage area at the Power Park. Because of the way that the conveyor linkage system from the SJRCT is tied into the Power Park coal handling system, the allocation of total coal storage at the Power Park between "active" and "inactive" zones changes. This change is due to the addition of a stacker and reclaimer along the eastern edge of the coal storage area, converting the zone within the reach of these machines from "inactive" to "active". The revised areas are used in conjunction with the emission factors in the existing permit to estimate new emission levels from the entire coal storage area. The results are presented in Section 5 and Appendix C. It should be noted that the size of the total coal storage area has not changed.

The emission estimates are assumed to reflect particulate matter (PM) that would be measured by a high-volume air sampler as specified in the reference sampling method for total suspended particulates (TSP). As a result, no particle size correction factors were applied (i.e., k = 1.0). This approach will lead to estimating maximum emissions since a value of k that is less than 1.0 will produce lower emission estimates.

The batch drop and continuous drop emission factor equations of AP-42 include a wind speed term. The emission factor is based on the annual average wind speed of 8.4 miles per hour (mph) obtained from the National Weather Service (NWS) station in Jacksonville (see Appendix B for an excerpt from the local climatological data summary). These data are the same as those referenced in the original PSD permit application.

The emission factors include a term that can account for the surface moisture of material being handled. A surface moisture content of 5 percent is used for coal handling.

Wetting with water and a chemical "wetting agent" will be performed at selected coal handling operations. The spray points are:

- ship unloader hoppers
- feeders below ship unloader hoppers
- Transfer Station 1
- Transfer Station 2

The amount of water and wetting agent to be applied at all spray points is expected to fully condition the coal (i.e. sufficiently sprayed to eliminate dust generation) before it arrives at Transfer Station 3 and subsequent transfers downstream. The water spray system shall be operated during unloading or transfer operations.

In accordance with the Power Park's Certification Order, the coal stream will be enclosed to the maximum extent practicable. The enclosure systems are described in Chapter 2.

The control efficiencies estimated for enclosure and suppression are shown in Table 3-2. The control efficiencies are based on a review of the literature and discussed in AP-42. The resulting particulate emission estimates are shown in Table 3-2. Throughput rates are based upon the maximum operating capacity of the equipment.

Table 3-1 Suspended Particulate Emission Factors and Parameters for Batch and Continuous Operations

---

1. Batch Drop Operations (AP-42 Section 11.2.3, Aggregate Handling and Storage Piles)

$$E = k\ (0.0018)\frac{\left(\frac{s}{5}\right)\left(\frac{U}{5}\right)\left(\frac{H}{5}\right)}{\left(\frac{M}{2}\right)^{2}\left(\frac{Y}{6}\right)^{(0.33)}}\ \text{(lbs/ton)}$$

2. Continuous Drop Operations (AP-42 Section 11.2.3)

$$E = k(0.0018)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{5}\right)\left(\frac{H}{5}\right)}{\left(\frac{M}{2}\right)^{2}}\ \text{(lbs/ton)}$$

where:

E = emission factor, lb/ton
k = particle size correction (= 1.0)
s = silt content (percent) (= 5)
M = surface moisture content (percent) (= 5)
U = wind speed (mph) (= 8.4)
H = drop height [feet (ft) ] (varies with each transfer)
Y = dumping device capacity (cubic yards ($yd^3$) ) (varies with the machine)

TABLE 3-2: EMISSION ESTIMATES AND CONTROL EFFICIENCIES FOR ST. JOHNS RIVER COAL TERMINAL AND BLENDING ADDITIONS.

CONTINUOUS TRANSFER OPERATIONS

| EMISSION SOURCE | k | S (%) | U (MPH) | H (FT) | M (%) | EFF. (%) | TONS/HOUR | UNCONTROLLED EMISSION RATE LBS/TON | CONTROLLED EMISSION RATE LBS/TON | TOTAL UNCONTROLLED EMISSION, LBS/HR | TOTAL CONTROLLED EMISSION, LBS/HR | TOTAL CONTROLLED EMISSION, GMS/SEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FEEDERS TO CONVEYOR A | 1 | 5 | 8.4 | 8 | 5 | 85 | 2200 | 0.000387072 | 0.0000580608 | 0.8515584 | 0.12773376 | 0.0160944538 |
| CONVEYOR A TO CONVEYOR B | 1 | 5 | 8.4 | 14 | 5 | 85 | 2200 | 0.000677376 | 0.0001016064 | 1.4902272 | 0.22353408 | 0.0281652941 |
| CONVEYOR B TO CONVEYOR C | 1 | 5 | 8.4 | 22 | 5 | 85 | 2200 | 0.001064448 | 0.0001596672 | 2.3417856 | 0.35126784 | 0.0442597478 |
| CONVEYOR C TO CONVEYOR D | 1 | 5 | 8.4 | 37 | 5 | 75 | 2200 | 0.001790208 | 0.000447552 | 3.9384576 | 0.9846144 | 0.1240614144 |
| CONVEYOR D TO CONVEYOR E | 1 | 5 | 8.4 | 29 | 5 | 75 | 2200 | 0.001403136 | 0.000350784 | 3.0868992 | 0.7717248 | 0.0972373248 |
| CONVEYOR E TO CONVEYOR C2 | 1 | 5 | 8.4 | 22 | 5 | 75 | 2200 | 0.001064448 | 0.000266112 | 2.3417856 | 0.5854464 | 0.0737662464 |
| CONVEYOR D TO CONVEYOR D THROUGH BY PASS | 1 | 5 | 8.4 | 9.5 | 5 | 75 | 2200 | 0.000459648 | 0.000114912 | 1.0112256 | 0.2528064 | 0.0318536064 |
| CONVEYOR F TO CONVEYOR D | 1 | 5 | 8.4 | 33 | 5 | 75 | 2000 | 0.001596672 | 0.000399168 | 3.193344 | 0.798336 | 0.100590336 |
| CONVEYOR C4 TO CONVEYOR F | 1 | 5 | 8.4 | 11 | 5 | 75 | 2000 | 0.000532224 | 0.000133056 | 1.064448 | 0.266112 | 0.033530112 |
| TRAVELLING STACKER | | | | | | | | | | | | |
| a. CONVEYOR D TO TRAILER CONVEYOR | 1 | 5 | 8.4 | 6.5 | 5 | 75 | 2200 | 0.000314496 | 0.000078624 | 0.6918912 | 0.1729728 | 0.0217945728 |
| b. TRAILER CONVEYOR TO BOOM CONVEYOR | 1 | 5 | 8.4 | 8 | 5 | 75 | 2200 | 0.000387072 | 0.000096768 | 0.8515584 | 0.2128896 | 0.0268240896 |
| c. BOOM CONVEYOR TO COAL STOCKPILE | 1 | 5 | 8.4 | 3.5 | 5 | 0 | 2200 | 0.000169344 | 0.000169344 | 0.3725568 | 0.3725568 | 0.0469421568 |
| BUCKET WHEEL RECLAIMER | | | | | | | | | | | | |
| a. BUCKET WHEEL TO BOOM CONVEYOR | 1 | 5 | 8.4 | 9 | 5 | 75 | 2000 | 0.000435456 | 0.000108864 | 0.870912 | 0.217728 | 0.027433728 |
| b. BOOM CONVEYOR TO CONVEYOR D | 1 | 5 | 8.4 | 17 | 5 | 75 | 2000 | 0.000822528 | 0.000205632 | 1.645056 | 0.411264 | 0.051819264 |

BATCH TRANSFER OPERATIONS

| EMISSION SOURCE | k | S(%) | U(MPH) | H (FT) | M(%) | EFF. (%) | Y(YD^3) | TONS/HR | UNCONTROLLED EMISSION RATE LBS/TON | CONTROLLED EMISSION RATE LBS/TON | TOTAL UNCONTROLLED EMISSION, LBS/HR | TOTAL CONTROLLED EMISSION, LBS/HR | TOTAL CONTROLLED EMISSION, GMS/SEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRAB BUCKET TO HOPPER | | | | | | | | | | | | | |
| a. #1 SHIP UNLOADER | 1 | 5 | 8.4 | 26 | 5 | 70 | 29.6 | 1500 | 0.0014858288 | 0.0004457486 | 2.2287431437 | 0.6686229431 | 0.0842464908 |
| b. #2 SHIP UNLOADER | 1 | 5 | 8.4 | 26 | 5 | 70 | 14.8 | 700 | 0.0018677066 | 0.000560312 | 1.3073946386 | 0.3922183916 | 0.0494195173 |
| COMBINED WEIGHTED AVERAGE EMISSION FACTOR UNLOADERS | 1 | 5 | 8.4 | 26 | 5 | 70 | --- | 2200 | 0.0016073353 | 0.0004822005 | 3.53613766 | 1.060841298 | 0.133666003 |

## 4.0 BEST AVAILABLE CONTROL TECHNOLOGY (BACT) SELECTION

Many techniques can be used to control fugitive emissions. Selection of controls employed depends largely on the ability to meet Ambient Air Quality Standards (AAQS) and PSD increments at the plant boundary, and economics. The selected controls must be able to comply with the Florida Department of Environmental Regulation Condition of Certification 1.A., Visible Emission Standard of 10-percent opacity, and the Standard for Unconfined Emissions of Particulate Matter (Chapter 17-2.610, Florida Administrative Code) which requires that "reasonable precautions" be taken to control fugitive emissions.

The fugitive emission controls to be used are presented in Appendix C, Table 2 . The combination of control technologies selected as BACT represents enclosures suitable for each application, and dust suppression systems applying water proportioned with "wetting agent". The selected technologies will ensure that AAQS and allowable PSD increments are met due to the proposed modifications because:

1. The emissions from the modified design for the SJRCT and the blending additions will be less than those emissions estimated from the existing permit for those sources affected by the modifications (see Section 5).

2. The air quality impacts from the new design will be less than those predicted in the existing permit (since emissions are less). As a result, since the air quality impacts predicted in the original permit complied with TSP, AAQS and PSD increments, impacts from the new design will also comply with these air quality standards.

3. The control methods proposed represent the most advanced controls known to exist at this time, considering economics and environmental benefits.

## 5.0 REVISIONS TO EXISTING PERMIT

Appendix C contains requested revisions to Tables 2 and 6 of the existing PSD permit for the St. Johns River Power Park (SJRPP). These revisions are based on the design and emission controls for the coal terminal and the blending additions and future coal handling transfers associated with the ship unloading facility coal storage pile (Table 2, Process No. 9 and Table 6, Emission Unit 12). Emission estimates have not been revised for those sources which are not changed by the proposed coal terminal and blending additions.

The only change made to these tables that can not be directly related to the deletion or addition of sources is a change in the allocation of total coal storage among "active" and "inactive" zones, as discussed in Chapter 3. With the design changes, 10 of the total 23 acres should now be considered "active".

A comparison of the estimated fugitive emissions from the coal terminal and coal blending additions with the estimated emissions for the original design is presented in Table 5-1. The design with emission controls will produce maximum total fugitive emissions of 9.02 pounds per hour (lb/hr). This emission estimate is based on the worst-case assumption that all new sources will be operating simultaneously at their peak design capacity.

The total emission estimate for existing permitted sources that will be modified is 9.12 lb/hr. Therefore, the fugitive emissions resulting from the design changes and controls (9.02 lbs/hr) are not expected to exceed either the emissions or air quality impacts presently approved in the existing PSD permit.

Table 5-1 Comparison of Fugitive Emission Estimates for the Proposed Coal Terminal and Coal Blending Additions with Existing Permitted Sources

| Emission Source | Control | (lb/hr) |
|---|---|---|
| **Proposed Design** | | |
| 1. Ship Unloading (2 Grab Buckets) | Supression, Enclosure | 1.0 |
| 2. Feeder to Conveyor A (2 Wet Suppression points) | Suppression, Enclosure | 0.13 |
| 3. Conveyor Transfers 1 & 2 (2 points) | Enclosure, Conditioned Material | 0.57 |
| 4. Conveyor Transfers 3, 4, 5 and D to D by pass (4 points) | Enclosure, Conditioned Material | 2.6 |
| 5. Conveyor Transfers 6 & 7 (2 points) | Enclosure, Conditioned Material | 1.0 |
| 6. Traveling Stacker (3 points) | Enclosure, Conditioned Material | 0.8 |
| 7. Bucket Wheel Reclaimer (2 points) | Enclosure, Conditioned Material | 0.6 |
| 8. Coal Storage at Plant (10 acres active) | Wetting Agent | 0.5 |
| 9. Coal Storage at Plant (2 to 13-acre inactive piles) | Wetting Agent | 0.02 |
| 10. Coal Handling Transfer Points Ship Unloading facility coal pile (8 points) | Enclosure, Conditioned Material | 1.8 |
| | TOTAL | 9.02 |
| **Existing Permitted Sources to be Modified** | | |
| 1. Ship Unloading (2 Grab Buckets) | Dry Collection | 0.32 |
| 2. Ship Unloading (6 transfer points) | Dry Collection | 0.6 |
| 3. Ship Unloading (3 points) | Wet Suppression | 7.5 |
| 4. Ship Unloading Facility Train, Loading Shed | Dry Collection | 0.2 |

Table 5-1 (continued)

| Emission Source | Control | (lb/hr) |
|---|---|---|
| 5. Coal Storage at Plant (8 acres active) | Wetting Agent | 0.4 |
| 6. Coal Storage at Plant (2-15-acre inactive piles) | Wetting Agent | 0.1 |
| | TOTAL | 9.12 |

APPENDICES

# APPENDIX A

# EXCERPTS FROM AP-42

## 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, during material loading onto the pile, during disturbances by strong wind currents, and during 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 correction parameters that characterize 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 from aggregate transfer itself or 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.

Field investigations have shown that emissions from aggregate storage operations vary in direct proportion to the percentage of silt (particles < 75 μm in diameter) in the aggregate material.[1 3] The silt content is determined by measuring the proportion 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).

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

| Industry | Material | Silt (%) No. of test samples | Silt (%) Range | Silt (%) Mean | Moisture (%) No. of test samples | Moisture (%) Range | Moisture (%) 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 | 0.96 |
| | 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 |

[a] References 2-5. NA = not applicable.
[b] Reference 1.
[c] Reference 6.
[d] Reference 7.

Adding aggregate material to a storage pile or removing it usually involves 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.

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

$$E = k(0.00090)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{2.2}\right)\left(\frac{H}{1.5}\right)}{\left(\frac{M}{2}\right)^2\left(\frac{Y}{4.6}\right)^{0.33}}\quad (kg/Mg)$$

$$E = k(0.0018)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{5}\right)\left(\frac{H}{5}\right)}{\left(\frac{M}{2}\right)^2\left(\frac{Y}{6}\right)^{0.33}}\quad (lb/ton)$$

where: E = emission factor
k = particle size multipler (dimensionless)
s = material silt content (%)
U = mean wind speed, m/s (mph)
H = drop height, m (ft)
M = material moisture content (%)
Y = dumping device capacity, $m^3$ ($yd^3$)

The particle size multipler (k) for Equation 1 varies with aerodynamic particle size, shown in Table 11.2.3-2.

TABLE 11.2.3-2. AERODYNAMIC PARTICLE SIZE MULTIPLIER (k) FOR EQUATIONS 1 AND 2

| Equation | < 30 µm | < 15 µm | < 10 µm | < 5 µm | < 2.5 µm |
|---|---|---|---|---|---|
| Batch drop | 0.73 | 0.48 | 0.36 | 0.23 | 0.13 |
| Continuous drop | 0.77 | 0.49 | 0.37 | 0.21 | 0.11 |

The quantity of particulate emissions generated by a continuous drop operation, per ton of material transferred, may be estimated, with a rating of C, using the following empirical expression[3]:

$$E = k(0.00090)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{2.2}\right)\left(\frac{H}{3.0}\right)}{\left(\frac{M}{2}\right)^2}\quad (kg/Mg) \qquad (2)$$

$$E = k(0.0018)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{5}\right)\left(\frac{H}{10}\right)}{\left(\frac{M}{2}\right)^2}\quad (lb/ton)$$

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

The particle size multiplier (k) for Equation 2 varies with aerodynamic particle size, as shown in Table 11.2.3-2.

Equations 1 and 2 retain the assigned quality rating if applied within the ranges of source conditions that were tested in developing the equations, as given in Table 11.2.3-3. Also, to retain the quality ratings of Equations 1 or 2 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 ratings of the equations are reduced by one level.

TABLE 11.2.3-3. RANGES OF SOURCE CONDITIONS FOR EQUATIONS 1 AND 2[a]

| Equation | Silt content (%) | Moisture content (%) | Dumping capacity | | Drop height | |
|---|---|---|---|---|---|---|
| | | | $m^3$ | $yd^3$ | m | ft |
| Batch drop | 1.3 - 7.3 | 0.25 - 0.70 | 2.10 - 7.6 | 2.75 - 10 | NA | NA |
| Continuous drop | 1.4 - 19 | 0.64 - 4.8 | NA | NA | 1.5 - 12 | 4.8 - 39 |

[a] NA = not applicable.

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.

For emissions from wind erosion of active storage piles, the following total suspended particulate (TSP) emission factor equation is recommended:

$$E = 1.9 \left(\frac{s}{1.5}\right) \left(\frac{365-p}{235}\right) \left(\frac{f}{15}\right) \quad \text{(kg/day/hectare)} \qquad (3)$$

$$E = 1.7 \left(\frac{s}{1.5}\right) \left(\frac{365-p}{235}\right) \left(\frac{f}{15}\right) \quad \text{(lb/day/acre)}$$

where: E = total suspended particulate emission factor
s = silt content of aggregate (%)
p = number of days with ≥ 0.25 mm (0.01 in.) of precipitation per year
f = percentage of time that the unobstructed wind speed exceeds 5.4 m/s (12 mph) at the mean pile height

The coefficient in Equation 3 is taken from Reference 1, based on sampling of emissions from a sand and gravel storage pile area during periods when transfer and maintenance equipment was not operating. The factor from Test Report 1, expressed in mass per unit area per day, is more reliable than the factor expressed in mass per unit mass of material placed in storage, for reasons stated in that report. Note that the coefficient has been halved to adjust for the estimate that the wind speed through the emission layer at the test site was one half of the value measured above the top of the piles. The other terms in this equation were added to correct for silt, precipitation and frequency of high winds, as discussed in Reference 2. Equation 3 is rated C for application in the sand and gravel industry and D for other industries.

Worst case emissions from storage pile areas occur under dry windy conditions. Worst case emissions from materials handling (batch and continuous drop) operations may be calculated by substituting into Equations 1 and 2 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) and for wind erosion (Equation 3), centering around 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 Control Methods

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.[8]

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, Research Triangle Park, NC, 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, Research Triangle Park, NC, May 1979.

4. R. Bohn, Evaluation of Open Dust Sources in the Vicinity of Buffalo, New York, U. S. Environmental Protection Agency, New York, NY, March 1979.

5. C. Cowherd, Jr., and T. Cuscino, Jr., Fugitive Emissions Evaluation, Equitable Environmental Health, Inc., Elmhurst, IL, 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, PEDCo Environmental, Inc., Kansas City, MO, July 1981.

8. 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.

APPENDIX B

JACKSONVILLE, FLORIDA

LOCAL CLIMATOLOGICAL DATA

EXCERPT FROM EXISTING PSD PERMIT APPLICATION

0357b, 5786AM

TABLE 2-5
JACKSONVILLE, FLORIDA
NORMALS, MEANS, AND EXTREMES

Station: JACKSONVILLE, FLORIDA # 13889 INTERNATIONAL AIRPORT Standard time used: EASTERN Latitude: 30° 30' N Longitude: 81° 42' W Elevation (ground): 26 feet

| Month | Temperatures °F Normal Daily maximum | Daily minimum | Monthly | Extremes Record highest | Year | Record lowest | Year | Normal Degree days Base 65 °F Heating | Cooling |
|---|---|---|---|---|---|---|---|---|---|
| (a) | | | | 37 | | 37 | | | |
| J | 64.0 | 44.5 | 54.3 | 85 | 1947 | 19 | 1977 | 348 | 25 |
| F | 66.9 | 45.7 | 56.3 | 88 | 1962 | 19 | 1943 | 282 | 38 |
| M | 72.4 | 50.1 | 61.2 | 91 | 1974 | 23 | 1943 | 176 | 58 |
| A | 79.0 | 57.1 | 68.1 | 95 | 1968 | 35 | 1973 | 24 | 117 |
| M | 84.9 | 62.9 | 74.3 | 100 | 1967 | 45 | 1973 | 0 | 288 |
| J | 88.3 | 70.0 | 79.2 | 103 | 1954 | 50 | 1966 | 0 | 426 |
| J | 90.0 | 72.0 | 81.0 | 105 | 1942 | 61 | 1972 | 0 | 496 |
| A | 89.7 | 72.3 | 81.0 | 102 | 1954 | 64 | 1950 | 0 | 496 |
| S | 86.0 | 70.4 | 78.2 | 100 | 1944 | 50 | 1967 | 0 | 396 |
| O | 79.6 | 61.7 | 70.7 | 96 | 1951 | 36 | 1977 | 19 | 190 |
| N | 71.9 | 51.0 | 61.5 | 88 | 1961 | 21 | 1970 | 161 | 47 |
| D | 65.6 | 45.1 | 55.4 | 84 | 1956 | 12 | 1962 | 317 | 19 |
| YR | 78.1 | 58.7 | 68.4 | 105 | JUL 1942 | 12 | DEC 1962 | 1327 | 2596 |

| Month | Precipitation in inches Water equivalent Normal | Maximum monthly | Year | Minimum monthly | Year | Maximum in 24 hrs. | Year | Snow, Ice pellets Maximum monthly | Year | Maximum in 24 hrs. | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (a) | | 37 | | 37 | | 37 | | 37 | | 37 | |
| J | 2.78 | 7.29 | 1964 | 0.06 | 1950 | 3.02 | 1963 | T | 1978 | T | 1978 |
| F | 3.58 | 8.85 | 1970 | 0.92 | 1962 | 6.22 | 1970 | 1.5 | 1958 | 1.5 | 1958 |
| M | 3.56 | 10.18 | 1973 | 0.18 | 1943 | 7.12 | 1970 | T | 1975 | T | 1975 |
| A | 3.07 | 11.61 | 1976 | 0.17 | 1942 | 8.29 | 1973 | 0.0 | | 0.0 | |
| M | 3.22 | 10.43 | 1966 | 0.01 | 1953 | 5.40 | 1975 | 0.0 | | 0.0 | |
| J | 6.27 | 12.90 | 1967 | 2.19 | 1950 | 5.93 | 1968 | 0.0 | | 0.0 | |
| J | 7.35 | 16.21 | 1960 | 1.97 | 1977 | 10.09 | 1966 | 0.0 | | 0.0 | |
| A | 7.89 | 16.24 | 1965 | 1.92 | 1962 | 7.83 | 1968 | 0.0 | | 0.0 | |
| S | 7.83 | 19.36 | 1949 | 1.02 | 1961 | 10.17 | 1950 | 0.0 | | 0.0 | |
| O | 4.54 | 13.44 | 1956 | 0.16 | 1962 | 6.66 | 1956 | 0.0 | | 0.0 | |
| N | 1.79 | 7.85 | 1947 | T | 1970 | 5.44 | 1969 | 0.0 | | 0.0 | |
| D | 2.59 | 7.09 | 1965 | 0.04 | 1956 | 3.70 | 1971 | T | 1962 | T | 1962 |
| YR | 54.47 | 19.36 | SEP 1949 | T | NOV 1970 | 10.17 | SEP 1950 | 1.5 | FEB 1958 | 1.5 | FEB 1958 |

| Month | Relative humidity pct. Hour 01 (Local time) | Hour 07 | Hour 13 | Hour 19 | Wind Mean speed m.p.h. | Prevailing direction | Fastest mile Speed m.p.h. | Direction | Year | Pct. of possible sunshine | Mean sky cover, tenths, sunrise to sunset | Mean number of days Sunrise to sunset Clear | Partly cloudy | Cloudy | Precipitation .01 inch or more | Snow, Ice pellets 1.0 inch or more | Thunderstorms | Heavy fog, visibility ¼ mile or less | Temperatures °F Max. (b) 90° and above | 32° and below | Min. 32° and below | 0° and below | Average station pressure mb. Elev. 31 feet m.s.l. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (a) | 42 | 42 | 42 | 42 | 29 | 14 | 29 | 29 | | 28 | 29 | 30 | 30 | 30 | 37 | 37 | 37 | 34 | 37 | 37 | 37 | 37 | 6 |
| J | 85 | 87 | 57 | 74 | 8.4 | NW | 41 | NW | 1971 | 57 | 6.0 | 9 | 8 | 14 | 8 | 0 | 1 | 6 | 0 | 0 | 5 | 0 | 1020.1 |
| F | 82 | 85 | 52 | 68 | 9.4 | WSW | 52 | NE | 1963 | 61 | 5.7 | 9 | 7 | 12 | 8 | * | 1 | 4 | 0 | 0 | 3 | 0 | 1019.0 |
| M | 82 | 85 | 49 | 69 | 9.6 | NW | 44 | SW | 1971 | 66 | 5.8 | 9 | 10 | 12 | 8 | 0 | 3 | 3 | * | 0 | 1 | 0 | 1017.4 |
| A | 83 | 85 | 47 | 64 | 9.1 | SE | 46 | N | 1973 | 72 | 5.2 | 11 | 10 | 9 | 6 | 0 | 3 | 3 | 2 | 0 | 0 | 0 | 1017.7 |
| M | 85 | 86 | 50 | 66 | 8.6 | WSW | 62 | N | 1975 | 69 | 5.5 | 9 | 12 | 10 | 8 | 0 | 7 | 3 | 9 | 0 | 0 | 0 | 1016.9 |
| J | 87 | 88 | 56 | 72 | 8.3 | SW | 76 | NE | 1967 | 62 | 6.2 | 6 | 13 | 11 | 12 | 0 | 10 | 1 | 16 | 0 | 0 | 0 | 1015.8 |
| J | 88 | 87 | 58 | 75 | 7.5 | SW | 49 | SW | 1950 | 60 | 6.4 | 5 | 14 | 12 | 15 | 0 | 16 | 1 | 23 | 0 | 0 | 0 | 1016.8 |
| A | 90 | 90 | 60 | 78 | 7.2 | SW | 52 | NE | 1969 | 59 | 6.2 | 5 | 13 | 11 | 15 | 0 | 13 | 2 | 21 | 0 | 0 | 0 | 1017.4 |
| S | 89 | 91 | 62 | 79 | 8.1 | NE | 82 | N | 1964 | 54 | 6.5 | 5 | 12 | 13 | 13 | 0 | 7 | 2 | 10 | 0 | 0 | 0 | 1015.6 |
| O | 88 | 90 | 58 | 78 | 8.6 | NE | 72 | E | 1950 | 57 | 5.5 | 10 | 9 | 12 | 9 | 0 | 2 | 3 | 1 | 0 | * | 0 | 1017.6 |
| N | 87 | 89 | 55 | 78 | 8.1 | NW | 60 | S | 1950 | 60 | 5.2 | 11 | 9 | 10 | 6 | 0 | 1 | 5 | 0 | 0 | 1 | 0 | 1019.3 |
| D | 86 | 88 | 58 | 77 | 8.2 | NW | 62 | N | 1965 | 56 | 5.9 | 10 | 8 | 13 | 8 | 0 | 1 | 5 | 0 | 0 | 4 | 0 | 1019.4 |
| YR | 86 | 87 | 55 | 75 | 8.4 | NW | 82 | N | SEP 1964 | 61 | 5.8 | 99 | 127 | 139 | 116 | * | 64 | 37 | 82 | 0 | 14 | 0 | 1017.6 |

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows: Lowest temperature 10 in February 1899; maximum monthly precipitation 23.32 in June 1932; maximum monthly snowfall 1.9 in February 1899; maximum snowfall in 24 hours 1.9 in February 1899.

(a) Length of record, years, through the current year unless otherwise noted, based on January data.
(b) 70° and above at Alaskan stations.
* Less than one half.
T Trace.

NORMALS - Based on record for the 1941-1970 period.
DATE OF AN EXTREME - The most recent in cases of multiple occurrence.
PREVAILING WIND DIRECTION - Record through 1963.
WIND DIRECTION - Numerals indicate tens of degrees clockwise from true north. 00 indicates calm.
FASTEST MILE WIND - Speed is fastest observed 1-minute value when the direction is in tens of degrees.

Source: (USDC, 1978)

# APPENDIX C

## REVISED TABLES 2 and 6 FROM

## EXISTING PSD PERMIT AND APPLICATION

0357b, 5786AM

Table 2. Fugitive Emissions and Control Summary (Revised; From PSD Permit)

| | Process | Type | Amount | Factor | Control | Technique | Emissions (Grams/Sec) |
|---|---|---|---|---|---|---|---|
| 1 | Ship Unloading* | 2 Grab Buckets | 2,200 Tons/hr | 0.0016 lb/Ton+ | 70.0% | Suppression, Enclosure | 0.13 |
| 2 | Feeders to Conveyor A* | 2 Points | 2,200 Tons/hr | 0.00039 lb/Ton | 85.0% | Suppression, Enclosure | 0.02 |
| 3 | Conveyor Transfers, 1 and 2* | 2 Points | 2,200 Tons/hr | 0.00087 lb/Ton** | 85.0% | Suppression Enclosure | 0.07 |
| 4 | Conveyor Transfers 3, 4, 5 and D to D by-pass* | 4 Points | 2,200 Tons/hr | 0.00118 lb/Ton** | 75.0% | Enclosure, Conditioned Material | 0.33 |
| 5 | Conveyor Transfers 6 and 7* | 2 Points | 2,000 Tons/hr | 0.00106 lb/Ton** | 75.0% | Enclosure, Conditioned Material | 0.13 |
| 6 | Traveling Stacker* | 3 Points: 1 Point | 2,200 Tons/hr | 0.00031 lb/Ton | 75.0% | Enclosure, Conditioned Material | 0.02 |
| | | 1 Point | 2,200 Tons/hr | 0.00039 lb/Ton | 75.0% | Enclosure, Conditioned Material | 0.03 |
| | | 1 Point | 2,200 Tons/hr | 0.00017 lb/Ton | 0.0% | | 0.05 |
| 7 | Bucket Wheel Reclaimer* | 2 Points | 2,000 Tons/hr | 0.00063 lb/Ton** | 75.0% | Enclosure, Conditioned Material | 0.08 |
| 8 | Ship-Unloading Facility Coal Surge Pile | Active | 30 Acres | 13 lb/Acre/day[a] | (90%)[a] | Wetting Agent | 0.20 |
| 9 | Coal Handling Transfer Points Ship Unloading Facility Coal Pile* | 8 Points | 2,200 Tons/Hr. | 0.00041 lbs/Ton** | 75.0% | Enclosure, Conditioned Material | 0.23 |
| 10 | Rail Car Unloading | Rotary Dumper | 10,000 Tons/Day | 0.4 lb/Ton[a] | (97%)[b] | Wet Suppression | 0.63 |
| 11 | Coal Handling Transfer Points | 2 Points | 10,000 Tons/Day | 0.2 lb/Ton[c] | (99.9%)[b] | Dry Collection | 0.02 |
| 12 | Coal Handling Transfer Points | 2 Points | 3,300 Tons/Day | 0.2 lb/Ton[c] | (99.9%)[b] | Dry Collection | 0.01 |
| 13 | Coal Handling Transfer Points | 6 Points | 3,300 Tons/Day | 0.2 lb/Ton[c] | (97%)[b] | Wet Suppression | 0.62 |
| 14 | Coal Handling Transfer Points | 7 Points | 5,000 Tons/Day | 0.2 lb/Ton[c] | (99.9%)[b] | Dry Collection | 0.04 |
| 15 | Coal Storage At Plant* | Active | 10 Acres | 13 lb/Acre/day[a] | (90%)[a] | Wetting Agent | 0.07 |
| 16 | Coal Storage At Plant* | 2 Inactive Piles | 13 Acres | 3.5 lb/Acre/day[a] | (99%)[a] | Wetting Agent | 0.002 |
| 17 | Limestone Unloading | Rail Dumper | 750 Tons/Day | 0.4 lb/ton[a] | (97%)[b] | Wet Suppression | 0.05 |
| 18 | Limestone Transfer | 1 Point | 750 Tons/Day | 0.2 lb/Ton[a] | (99.9%)[b] | Dry Collection | 0.001 |
| 19 | Cooling Towers | Drift | 2 x 243,500 gal/min | 51,450 ppm solids (maximum) (40% < 50 microns diameter) | 99.998% | Drift Elimination | 12.66 |
| 20 | Solid Waste Disposal Area | Active | 10 Acres | 13 lb/Acre/day[a] | (90%)[a] | Wetting Agent | 0.07 |

* Revised process or emissions, May 1986.
\+ Weighted average based on 1,500 and 700 STPH ship unloaders.
** Average of emission factors for individual sources.

a. Pedco, 1977.
b. Stoughton, 1980.
c. EPA, 1979.



0400b(050886)PM

Table 6. Allowable Emission Limits (Revised; From PSD Permit) (lb/hour; lb/MMBtu)

| Emission Unit | $SO_2$ | $NO_x$ | PM (Revised Original) | Opacity (Percent) |
|---|---|---|---|---|
| 1. Steam Generating Boiler No.1 (6,144 MMBtu/hr maximum heat input) | 4,669.; 0.76 (30-day rolling average) | 3,686; 0.6 | 184; 0.03 | 20 |
| 2. Steam Generating Boiler No. 2 (6,144 MMBtu/hr maximum heat input) | 4,669; 0.76 (30-day rolling average) | 3,686; 0.6 | 184; 0.03 | 20 |
| 3. Auxiliary boilers (254 MMBtu/hr maximum heat input total) | 203; 0.8 | | 25.0; 0.1 | 20 |
| 4. Ship Unloading (2 Grab Buckets)* | | | 1.0 | 10 |
| 5. Feeders to Conveyor A (2 Wet Suppression points)* | | | 0.13 | 10 |
| 6. Conveyor Transfers 1 & 2 (2 points)* | | | 0.57 | 10 |
| 7. Conveyor Transfer 3, 4, 5 & D to D by-pass (4 points)* | | | 2.6 | 10 |
| 8. Conveyor Transfers 6 & 7 (2 points)* | | | 1.0 | 10 |
| 9. Traveling Stacker (3 points)* | | | 0.8 | 10 |
| 10. Bucket Wheel Reclaimer (2 points)* | | | 0.6 | 10 |
| 11. Ship unloading facility coal storage pile | | | 1.6 | 10 |
| 12. Coal handling transfer points ship unloading facility coal pile (8 points)* | | | 1.8 | 10 |
| 13. Rail car unloading (Rotary Dumper) | | | 5 | 10 |
| 14. Coal handling transfer points (6 wet suppression points) | | | 5(each) | 10 |
| 15. Coal handling transfer points (11 dry collection) | | | 0.1(each) | 10 |
| 16. Coal storage at plant* (10 acres active) | | | 0.5 | 10 |
| 17. Coal storage at plant* (2 to 13-acre inactive piles) | | | 0.02 | 10 |
| 18. Limestone unloading (rail dumper) | | | 0.1 | 10 |
| 19. Limestone transfer points | | | 0.4(each) | 10 |
| 20. Cooling towers | | | 67(each tower) | N/A |

* Revised emission unit, May 1986.