TECHNICAL REVIEW DOCUMENT
For
OPERATING PERMIT 03OPMR244
To be issued to:

Boral Material Technologies, Inc. – Pawnee Station
Morgan County
Source ID 0870011

Prepared March and April 2003
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Revised April 17, May 23, and August 18, 2003
Revised September 12, 2003 based on EPA comments during EPA's 45-day review period to remove "information only" language associated with the fugitive particulate matter emission limits

I. Purpose:

This document will establish the basis for decisions made regarding the Applicable Requirements, Emission Factors, Monitoring Plan and Compliance Status of Emission Units covered within the Operating Permit proposed for this site. It is designed for reference during review of the proposed permit by the EPA and during Public Comment. The conclusions made in the report are based on information provided in the original application submittal of January 31, 2003, e-mail correspondence and telephone conversations with the source. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Source Description:

Boral Material Technologies, Inc (BMTI) conducts ash conditioning, handling and blending operations system at Public Service Company's Pawnee Station. Pawnee station is classified as an electric services facility under Standard Industrial Classification 4911. BMTI is a support facility for Pawnee Station and as such is considered a single stationary source with Pawnee Station for purposes of prevention of significant deterioration (PSD) review, Title V operating permit and MACT requirements. Public Service Company (PSCo) was issued a Title V operating permit (96OPMR129)

for Pawnee Station. The Title V operating permit issued to BMTI will address only the ash conditioning, handling and blending activities performed by BMTI. Ash conditioning, handling and blending operations include both fugitive and non-fugitive particulate matter emission sources.

It should be noted that there is another power plant co-located with PSCo's Pawnee Station on property owned by PSCo. This power plant consists of two natural gas-fired, simple cycle combustion turbines and is known as the Manchief Generating Station. During the processing of the initial approval construction permit for the Manchief Station, the Division considered Pawnee and Manchief to be separate sources for purposes of PSD, Title V and MACT requirements. During the processing of the Title V Operating Permit for the Manchief facility, EPA indicated that the Division should review the single vs. separate source determination made previously for Manchief and Pawnee. The Division is currently reviewing this determination. The Division considers that BMTI is a single source with PSCo's Pawnee station and any facility that is considered a single source with PSCo's Pawnee Station for purposes of PSD, Title V and MACT requirements.

The following is a description of the ash conditioning, handling and blending operations conducted by BMTI. Fly ash is transferred from the fly ash silo via enclosed screw conveyors to an enclosed conditioning system (pug mill) where water is added to create conditioned ash. The conditioned ash is then gravity transferred directly into a truck inside the ash conditioning (or MACS) building or onto the MACS building floor, then loaded onto trucks with a front-end loader. The conditioned ash is then hauled to an area (the PSCo ash pit) that serves as the storage and blending operation for bottom ash, conditioned ash, and sometimes, rock. The bottom ash is hauled to the blending area from an on-site PSCo storage bay. The rock is hauled in from off-site. The bottom ash and conditioned ash (and rock, as needed) are blended and screened to create a beneficial reuse product – base course (e.g. road base). Finally, the base course is loaded and hauled off-site as product.

This facility is located at 14940 County Road 24, near Brush in Morgan County, in an area designated as attainment for all criteria pollutants. There are no affected states within 50 miles of this facility. There are no Federal Class I designated areas within 100 kilometers of this facility.

This source (BMTI and PSCo) is a major stationary source (Potential to Emit > 100 tons/year) for purposes of PSD review. Future modifications to this facility which are in excess of significance levels as defined in Colorado Regulation No. 3, Part A, Section I.B.58, would result in a major modification and the application of PSD requirements. Facility wide (BMTI and PSCo) emissions are as follows:

Pollutant	Potential to Emit (tons/yr)			Actual Emissions (tons/yr)		
	PSCo	BMTI	Facility	PSCo	BMTI	Facility
PM	2,501.7	22.93	2,524.63	724.2	22.93	747.13
PM_{10}	2,231.6	8.91	2,240.51	638.8	8.91	647.71
NO_X	11,765	N/A	11,765	4,893.4	N/A	4,893.4
SO_2	28,176.9	N/A	28,176.9	14,677.9	N/A	14,677.9
CO	754.7	N/A	754.7	582.6	N/A	582.6
VOC	91.5	N/A	91.5	72.2	N/A	72.2
HAPS	143.6	Negl.	143.6	24.8	Negl.	24.8

Potential to emit and actual emissions for PSCo are the same values included in the technical review document to support the original Title V permit operating permit (issued January 1, 2003). Potential to emit for BMTI is based on permitted emissions. BMTI reported potential emissions as actual emissions on the most recent APEN, which is an acceptable practice. It should be noted that the Title V operating permit issued to PSCo for Pawnee Station includes conditions for processing fly ash through the ash silo and depositing fly ash at the ash pit. Generally, processing of most of the fly ash at Pawnee Station is done by BMTI. Therefore, emissions from ash handling are “double counted” in that they are included in the PTE analysis and the operating permit for PSCo and also for BMTI.

Pawnee Station is subject to the provisions of Section 112(r) of the Federal Clean Air Act. 112(r) requires the submittal of a risk management plan (RMP) by June 20, 1999 and PSCo did submit an RMP by the June 20, 1999 deadline. The provisions of Section 112(r) are not applicable to the ash conditioning, handling and blending operations performed by BMTI.

The facility (PSCo and BMTI) is a major source for hazardous air pollutants (HAPS). However, there have been no MACT standards promulgated that apply to the BMTI operations and sources. In addition, BMTI has no equipment that falls under a source category for which EPA did not promulgate a MACT standard by the regulatory deadline and therefore, BMTI is not subject to the case-by-case MACT requirements in Section 112(j) of the Act.

Although the BMTI emission units utilize controls to reduce emissions, the pre-control potential to emit for the emission units are below the major source level and therefore the compliance assurance monitoring (CAM) requirements do not apply.

III. Emission Sources:

The following sources are specifically regulated under terms and conditions of the Operating Permit for this Site:

A. Unit MACS: AshTech Fly Ash Conditioning System, Model # M-16 and Associated MACS Building

1 Applicable Requirements –Fly ash is transferred from the fly ash silo via enclosed screw conveyors to an enclosed conditioning system (pug mill) where water is added to create conditioned ash. The conditioned ash is then gravity transferred directly into a dump truck or loaded via front end loader inside the ash conditioning (or MACS) building. Particulate matter emissions from the ash conditioning system and MACS building are not considered fugitive particulate matter emissions since the emissions can (and do) reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening. According to the Title V permit application, the ash conditioning system commenced operation in January 2002. Colorado Construction Permit 01MR0683 was issued for the ash conditioning, handling and blending operations on November 19, 2001 as an initial approval permit. For final approval, the source requested an increase in the throughput rate, and the emissions were increased to reflect the higher throughput rate. A final approval permit was issued for Colorado Construction Permit 01MR0683 on November 26, 2002. The appropriate applicable requirements from Colorado Construction Permit 01MR0683 for the ash conditioning system and MACS building are as follows:

- Visible emissions shall not exceed twenty percent (20%) opacity during normal operation of the source. During periods of startup, process modification, or adjustment of control equipment visible emissions shall not exceed 30% opacity for more than six minutes in any sixty consecutive minutes (condition 1 and Reg 1, Section II.A.1 and 4).

  Based on engineering judgment, the Division has not included the 30% opacity requirement for startup, process modification and adjustment of control equipment (Reg 1, Section II.A.4) for the following reasons: 1) startup is instantaneous; 2) process modifications are unlikely since the process is simple and straightforward and 3) the control equipment is structural, i.e. building or enclosures and adjustment or occasional cleaning is not relevant.

- The source shall be limited to a maximum process rate as listed below and all other activities, operational rates and numbers of equipment as stated in the application (condition 3).

  Processing and handling of fly ash, bottom ash, or conditioned product shall not exceed 120,000 tons/yr.

  Note that, only fly ash and the conditioned ash is processed through the fly ash conditioning system.

- Emissions of air pollutants shall not exceed the following limitations (condition 4):

PM 4.3 tons/yr
PM_{10} 2.69 tons/yr

- APEN reporting requirements (condition 6)

  The APEN reporting requirements will not be identified in the permit as a specific condition but are included in Section IV (General Conditions) of the permit, condition 22.e.

The Division determined that no Regulation No. 1 particulate matter standards were applicable. Operations at the fly ash conditioning system and MACS building are not considered fugitive emissions (PM requirements - Reg 1, Section III.D). The purpose of the fly ash conditioning system is to convert the fly ash, which is a by-product of PSCo's operation of their utility boiler, into a usable product. The technical review document to support the original Title V operating permit for PSCo Pawnee, indicated that Reg 1 particulate matter requirements for manufacturing processes (Reg 1, Section III.C) did not apply to the fly ash silo since the ash was a by-product and no "product" was made with it and that prior to disposal or removal for sale, it was not processed further. Although the purpose of the fly ash conditioning system is to convert the fly ash into a usable product, the Division still considers that the fly ash conditioning system is not a manufacturing process. The Division did not intend to consider such simple processing steps as manufacturing processes. In addition, the fly ash conditioning process, mixing water with ash, effectively reduces emissions. Therefore, the Division does not consider the fly ash conditioning system to be a manufacturing process and therefore the Reg 1 particulate matter requirements for manufacturing processes (Reg 1, Section III.C) don't apply. In addition, since the Division does not consider the fly ash conditioning system to be a manufacturing process, the state-only PM requirements in Reg 6, Part B, Section III (Standards of Performance for New Manufacturing Processes) are also not applicable.

2. Emission Factors - The fly ash conditioning process consists of two steps: transfer of the fly ash from the storage silo to the conditioner and transfer of conditioned ash to either a truck or to the floor of the MACS building and then loading into a truck.

For transfer of ash from the fly ash silo to the conditioning system, permitted emissions are based on emission factors from EPA's Compilation of Emission Factors (AP-42), Section 11.17, Table 11.17-4, Product Unloading - Enclosed Truck, dated January 1995, as indicated below. These emission factors are consistent with the emission factors used by PSCo for fly ash handling at Pawnee and their other coal-fired power plants.

PM = 0.61 lbs/ton
PM_{10} = 0.61 lbs/ton

A control efficiency of 95% is allowed since the transfer from the silo to the conditioner, since the screw conveyors and conditioner are enclosed.

For conditioned ash transfer, loading and unloading, the source used emission factors from the AWMA Air Pollution Engineering Manual (Second Edition, 2000), Table 1, page 693, for coal processing:

> PM = 0.2 lbs/ton transferred or conveyed
> PM_{10} = 0.072 lbs/ton transferred or conveyed
>
> PM_{10} is presumed to be 0.36 x PM
>
> The Division will allow control efficiencies as follows: 90% for the ash conditioning building for enclosed building (one transfer point for dumping from the conditioner to the building floor and one transfer point for loading trucks).

This is consistent with the emission factors used by PSCo for dumping fly ash at the ash pit at the Pawnee facility.

3. Monitoring Plan - The source shall be required to record fly ash/conditioned product throughput and calculate emissions monthly. In the absence of credible evidence to the contrary, opacity emissions from the fly ash conditioning system shall be presumed to be in compliance with the opacity requirements provided the integrity of the enclosures (conveyors, conditioner and building) is maintained.

4. Compliance Status - The Title V permit application indicates that the fly ash conditioning system and MACS building is in compliance with all applicable requirements.

B. Unit F001: Fugitive Particulate Matter Emissions from Transport, Storage and Blending Operations

1. Applicable Requirements - Sources of fugitive particulate emissions from the BMTI ash conditioning, handling and blending operations consist of hauling conditioned ash from the ash conditioner to the ash pit which serves as the site for storage and blending of bottom ash, conditioned ash, and occasionally rock. The bottom ash is hauled to the blending area from an on-site PSCo storage bay. The rock is hauled in from off-site. The bottom ash and conditioned ash (and rock, as needed) are blended and screened to create a beneficial reuse product – base course (e.g. road base). The base course is then loaded onto trucks and hauled off-site as product.

The Title V permit application indicates that the portable blending operation consists of open feeder hoppers, open conveyors, and open screens (scalping screen and sizing screen).

Fugitive particulate matter emissions from ash conditioning and blending are also addressed in Colorado Construction Permit 01MR0683. The appropriate applicable requirements from Colorado Construction Permit 01MR0683 for the fugitive particulate matter emissions from conditioned ash handling and blending are as follows:

- Visible emissions shall not exceed twenty percent (20%) opacity during normal operation of the source. During periods of startup, process modification, or adjustment of control equipment visible emissions shall not exceed 30% opacity for more than six minutes in any sixty consecutive minutes (condition 1 and Reg 1, Section II.A.1 and 4).

  Note that for fugitive emissions, the 20%/30% opacity requirements are not really applicable requirements but the 20% opacity serves as a guideline for the Division to require that a fugitive particulate emission control plan be revised. Therefore, the 20% opacity requirement will not be included in the permit.

- The source shall be limited to a maximum process rate as listed below and all other activities, operational rates and numbers of equipment as stated in the application (condition 3).

  Processing and handling of fly ash, bottom ash, or conditioned product shall not exceed 120,000 tons/yr.

  Note that at the blending site, only conditioned ash and bottom ash are processed. In addition, although not specified in the construction permit, BMTI may bring in rock as necessary. The Division will include rock in the Title V operating permit. Note that the processing of rock will not change the emission factors or permitted emissions.

- Emissions of air pollutants shall not exceed the following limitations (condition 4):

PM	18.7 tons/yr
PM_{10}	6.22 tons/yr

  Compliance with the emission limits will be presumed provided the quantity of the material handled is within the permit limits and that the provisions in the fugitive particulate matter control plan are followed.

- APEN reporting requirements (condition 6)

  The APEN reporting requirements will not be identified in the permit as a specific condition but are included in Section IV (General Conditions) of the permit, condition 22.e.

- The particulate emission control measures listed below shall be applied to the fugitive particulate emission producing sources as required by Regulation No. 1, Section III.D.1.b (condition 5):

  - Material stockpiles shall be watered as necessary to control fugitive particulate matter emissions. Materials shall be sprayed with water during material loading into trucks as necessary to control fugitive particulate matter emissions.

- The plant entryway, truck service roads, and material handling areas shall be watered as necessary to control fugitive particulate matter emissions.

- Vehicle speed on haul roads and service roads shall be restricted to 20 miles per hour. Speed limit signs shall be posted.

- Dry fly ash shall not be stored in bulk open stockpiles.

- All active unpaved haul roads shall be watered daily to reduce visible emissions. Daily watering is not required when no haul trucks are using the unpaved roads, following rain or snow events that provide sufficient moisture to control fugitive dust, or when the application of water creates a safety hazard due to ice formation on the roads. Chemical stabilization of the unpaved road surfaces can also be used to reduce the need for daily watering.

  Since not all haul roads at Pawnee are utilized by BMTI, this control measure was revised to specify that the control measure only applies to the haul roads used by the permittee. It should be noted that in the Title V operating permit issued to PSCo, there is a similar control measure for watering active haul roads daily.

- The trucks transporting dry fly ash shall be fully covered to prevent emissions.

  It should be noted that BMTI is contracted by PSCo to haul dry fly ash off site. The dry fly ash is unloaded directly from PSCo's ash silo to an enclosed truck, using PSCo equipment. The dry fly ash unloading operation is included in the Title V operating permit issued to PSCo. Since BMTI would be hauling the dry fly ash, this control measure is included in the draft Title V operating permit for BMTI.

- The haul roads shall be inspected on a daily basis, and any spillage of materials shall be cleaned up as soon as practical to minimize fugitive particulate matter emissions.

  This control measure will be revised to be consistent with the daily watering requirement. Only active haul roads used by BMTI need to be inspected and daily inspection are not required if haul trucks are not using the haul roads.

The construction permit issued to BMTI did not provide for the processing of rock. The Title V permit application indicated that rock may be added in the blending process. The Division considers that the addition of rock in the blending process does not subject any of the blending equipment to the requirements in 40 CFR Part 60 Subpart OOO,

since the BMTI operations do not meet the definition of a fixed or portable non-metallic mineral processing plant, since no crushing or grinding occur at the facility.

2. Emission Factors – Fugitive emissions are emissions that cannot reasonably pass through a stack, chimney, vent, or other functionally-equivalent opening. The presence of outdoor storage and handling of relatively fine particulate matter subjected to wind and mechanical devices results in fugitive emissions. The emissions of interest include particulate matter (PM) which is typically particulates with a relatively coarse size range and particulate matter less than 10 microns in diameter (PM_{10}).

Fugitive PM and PM_{10} emissions are subject to APEN reporting requirements but are not subject to annual fees. The Division will not require emission calculations for these fugitive emission sources on any specified frequency. However, these sources are subject to the requirements of APEN reporting and the source must comply with these requirements. The emission factors included in the following section identify the emission factors used to set the fugitive particulate matter emissions in the construction permit. These emission factors are included in Appendix G of the permit for informational purposes only.

<u>Loading, unloading and Blending</u>

For conditioned ash, bottom ash or rock transfer, loading and unloading, the source used emission factors from the AWMA Air Pollution Engineering Manual (Second Edition, 2000), Table 1, page 693 (emission factors for coal:

PM = 0.2 lbs/ton transferred or conveyed
PM_{10} = 0.072 lbs/ton transferred or conveyed

PM_{10} is presumed to be 0.36 x PM

This is consistent with the emission factors used by PSCo for dumping fly ash at the ash pit at the Pawnee facility. The Division will allow control efficiencies as follows: For dumping at the pit, blending, and loading and unloading, an efficiency of 50% is allowed for the materials (i.e. wetted (conditioned) fly ash, bottom ash that has a consistency of rock and rock) and for the blending site (i.e. a pit, with natural barriers).

The permitted emissions from loading, unloading and blending are based on the above emission factor and one transfer point. Based on the description of the process equipment in the Title V permit application, material may be dropped or transferred more than once and there are two screens for the material to pass through. However, the emission factors used in the preliminary analysis for the most recent construction permit are sufficiently conservative to allow that emissions be calculated considering only one transfer point. As a comparison, the Division considered that since the conditioned fly ash and the bottom ash have a rock-like consistency, the emissions could be estimated using AP-42 emission factors for crushed stone processing (Section 11.19-2, dated January 1995). Those emission factors for uncontrolled PM_{10} emissions for conveyor transfer points and screening are 0.0014 lbs/ton and 0.015 lbs/ton,

respectively, which are much less conservative that the emission factor used to set the permit limits.

Roads

For travel on roads, the Division used the emission factors from AP-42, Section 13.2.2, dated September 1998, as follows:

$$E = \frac{k \times (s/12)^a \times (W/3)^b}{(M/0.2)^c}$$

where:
E = particulate emissions, in lbs/VMT
VMT = vehicle miles traveled per year
k = constant, dimensionless, see table below
a = constant, dimensionless, see table below
b = constant, dimensionless, see table below
c = constant dimensionless, see table below
s = silt content of road surface material, in % (6.6%, per AP-42, Table 13.2.2-1, for municipal solid waste landfills, this value was used by PSCo for Pawnee emission estimates)
W = mean weight of vehicle, in tons (per initial approval application, W = 8 tons)
M = surface moisture content, % (1.45%, this value was used by PSCo for Pawnee emission estimates)

Constant	PM	PM_{10}
K	10	2.6
A	0.8	0.8
B	0.5	0.4
C	0.4	0.3

These emission factors are consistent with the emission factors used by PSCo for fugitive particulate matter emissions from vehicle traffic on unpaved road at the Pawnee facility.

3. Monitoring Plan - Emission limits are included in the permit for informational purposes only. The source is subject to the APEN reporting requirements for fugitive particulate matter emissions from the storage, transport and blending operations. The Division will not require the source to calculate emissions on any specified frequency; however, the source is responsible for submitting revised APENs as specified by Regulation No. 3, Part A, Section II.C.

The BMTI transport, storage and blending operations are considered a new source and therefore, have a Division approved fugitive particulate matter control plan as required by Regulation No. 1, Section II.d.1.b. The certification submitted with the semi-annual monitoring and permit deviation reports shall serve as the compliance indicator that the source is meeting the requirements in their fugitive particulate matter control plan.

There is an annual processing rate limitation on the quantity of conditioned ash, bottom ash and rock that is transported, stored and blended. The source will be required to monitor and record the quantities of material processed monthly.

4. Compliance Status - The Title V permit application indicates that fugitive particulate matter emissions from ash conditioning and blending are in compliance with all applicable requirements.

IV. Insignificant Activities:

General categories of insignificant activities include: in-house experimental or analytical laboratory equipment, chemical storage tanks/containers < 500 gal or storage areas < 5,000 gal, lube oil storage tanks (< 40,000 gal) and other storage tanks (limited throughput and contents) and fuel storage and dispensing equipment. Specific insignificant activities identified in the Title V permit application are:

<u>In-house experimental and analytical laboratory equipment (Reg 3 Part C.II.E.3.i)</u>

- In-house QA/QC lab

<u>Chemical storage tanks or containers < 500 gal (Reg 3 Part C.II.E.3.n)</u>

- Consumer-type chemical storage containers in consumer quantity sizes storing miscellaneous cleaning and maintenance chemicals (e.g. lubricants, WD-40)
- Petroleum products including hydraulic oil, grease, gasoline, fuel oil, engine additives, etc. for vehicle and equipment upkeep and operation (all in 55 gallon drum containers or smaller)

<u>Operations involving acetylene, butane, propane or other flame cutting torches (Reg 3 Part C.II.E.3.kk)</u>

- Torch and welding equipment

<u>Venting of compressed natural gas, butane or propane gas cylinders, < 1 gal (Reg 3, Part C.II.E.3.zz)</u>

- Small portable propane bottles for individual heating use

<u>Fuel storage and dispensing equipment in ozone attainment areas throughput < 400 gal/day averaged over 30 days (Reg 3 Part C.II.E.3.ccc)</u>

- Diesel fuel storage tank (500 gal)

V. Alternative Operating Scenarios

No alternative operating scenarios were requested for this facility.

VI. Permit Shield

The source did not request the permit shield for any non-applicable requirements.