

February 27, 2017

Administrator  
Maryland Department of the Environment  
Land Management Administration  
Solid Waste Program  
1800 Washington Boulevard, Suite 605  
Baltimore, Maryland 21230-1719

Re: Calendar Year 2016 Generator Tonnage Reports for the Brandon Shores  
and H. A. Wagner Electric Generating Stations

Dear Administrator:

Enclosed please find the 2016 Coal Combustion Byproducts (CCBs) Annual Generator Tonnage Reports for Raven Power's Brandon Shores and H.A. Wagner generating facilities. These reports cover the period from January 1, 2016 to December 31, 2016 for the coal-fired units at these facilities and reflect coal combustion byproduct production, beneficial reuse, and disposal.

For any questions regarding these reports, please contact me at 410-787-6431, or by email at [bhojt@raven-power.com](mailto:bhojt@raven-power.com). You may also contact Thomas Weissinger, Director, Environmental, at 410-787-5532, or by email at [tweissinger@raven-power.com](mailto:tweissinger@raven-power.com).

Regards,



Brian Hoyt  
Environmental Manager

Enclosures (2)

**RECEIVED**

**MAR 01 2017**

**LAND MANAGEMENT ADMIN.  
SOLID WASTE PROGRAM**

# MARYLAND DEPARTMENT OF THE ENVIRONMENT

Land Management Administration • Solid Waste Program  
1800 Washington Boulevard • Suite 605 • Baltimore Maryland 21230-1719  
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## **Coal Combustion Byproducts (CCBs) Annual Generator Tonnage Report Instructions for Calendar Year 2016**

The following is general information relating to the requirement for reporting quantities of coal combustion byproducts (CCBs) that were managed in the State of Maryland during calendar year 2016. Please answer the questions on the form provided, attaching additional information and any requested supplemental information to the back of the form. *Note that the form for this year requires both volume and weight of the CCBs produced. If you know one of these parameters but not the others, for example, you have the tonnage produced but not the volume, you may calculate the other parameter; however, please provide the calculations and assumptions that you used in your estimate.* Questions can be directed to the Solid Waste Program at (410) 537-3315 or via email at [ed.dexter@maryland.gov](mailto:ed.dexter@maryland.gov).

**I. Background.** This requirement that generators of CCBs submit an annual report was instituted in the Code of Maryland Regulations COMAR 26.04.10.08, that was promulgated effective December 1, 2008. The regulation requires that any non-residential generator of CCBs submit a report to the Department by March 1 of each year describing the manner in which CCBs generated within the State were managed during the preceding calendar year. Additional information and specific instructions follow. For more detailed information, please refer to COMAR 26.04.10.08.

### **II. General Information and Applicability.**

**A. Definitions.** CCBs are defined in COMAR 26.04.10.02B as:

*"(3) Coal Combustion Byproducts. (a) "Coal combustion byproducts" means the residue generated by or resulting from the burning of coal.*

*(b) "Coal combustion byproducts" includes fly ash, bottom ash, boiler slag, pozzolan, and other solid residuals removed by air pollution control devices from the flue gas and combustion chambers of coal burning furnaces and boilers, including flue gas desulfurization sludge and other solid residuals recovered from flue gas by wet or dry methods."*

A generator of CCBs is defined in COMAR 26.04.10.02B as:

*"(9) Generator.*

*(a) "Generator" means a person whose operations, activities, processes, or actions create coal combustion byproducts.*

*(b) "Generator" does not include a person who only generates coal combustion byproducts by burning coal at a private residence."*

**B. Applicability.** If you or your company meets the definition of a generator of CCBs as defined above, you must provide the information as required below. For the purposes of this

Facility Name: Brandon Shores Generating Station

## CCB Tonnage Report – 2016

report, “you” shall hereinafter refer to the generator defined above. Please note that COMAR 26.04.10.08 requires generators of CCBs to submit an annual report to the Department concerning the disposition of the CCBs that they generated the previous year. **THIS INCLUDES CCBS THAT WERE NOT SEPARATELY COLLECTED BUT WERE PRODUCED BY THE BURNING OF COAL AND WERE DIRECTLY CONTRIBUTED TO A PRODUCT, such as cement.** Where the amount cannot be directly measured, estimates based on the amount of coal burned can be used. The method of determining the volume of CCBs produced must be described.

**III. Required Information.** The following information must be provided to the Department by March 1, 2017:

A. Contact information:

Facility Name: Brandon Shores Generating Station

Name of Permit Holder: Brandon Shores LLC

Facility Address: 2030 Brandon Shores Road  
Street

Facility Address: Baltimore Maryland 21226  
City State Zip

County: Anne Arundel

Contact Information (Person filing report or Environmental Manager)

Facility Telephone No.: 410-787-5531 Facility Fax No.: \_\_\_\_\_

Contact Name: Brian Hoyt

Contact Title: Environmental Manager

Contact Address: 1005 Brandon Shores Road, Suite 100  
Street

Contact Address: Baltimore Maryland 21226  
City State Zip

Contact Email: bhoyt@raven-power.com

Contact Telephone No.: 410-787-6431 Contact Fax No.: 410-787-5160

*For questions on how to complete this form, please contact the Solid Waste Program at 410-537-3315*

B. A description of the process that generates the CCBs, including the type of coal or other raw material that generates the CCBs. If the space provided is insufficient, please attach additional pages:

The Brandon Shores electrical generating station consists of two coal fired units which produce electricity for commercial sale. Both units are equipped with Babcock & Wilcox natural circulation radiant boilers. For both units, bituminous coal is delivered by barge and stored in a pile adjacent to the plant. A proprietary additive, Chem-Mod®, is added to the coal for NO<sub>x</sub> and mercury reduction as it is conveyed by belt from the coal pile to storage bunkers in the plant. The coal is then pulverized and fed by air to the boilers where it is burned using low NO<sub>x</sub> burners.

On both units, the heavier ash (a.k.a. bottom ash) drops to the bottom of the boilers where it is conveyed by high-pressure water to settling bins before being eventually loaded onto trucks for beneficial reuse or disposal. Lighter ash (a.k.a. fly ash) is conveyed by furnace air flow to electrostatic precipitators where the ash is collected on charged plates and falls to storage hoppers below. The fly ash from the hoppers is then conveyed pneumatically to storage silos before being loaded onto trucks and sent off site for beneficial reuse or disposal. However, before the fly ash is sent off site, a portion of the fly ash that is high in carbon is separated out and sent back to the plant to be re-burned. In 2016, 14,185 tons (19,104 CY) of this high-carbon material was transferred back to Brandon Shores for re-burning. Later in the flue gas stream, pulse jet fabric filters downstream of the precipitators remove any remaining fly ash which has been mixed with powdered activated carbon and hydrated lime injected into the flue gas stream for emissions control. This fly ash is conveyed to storage silos for eventual reuse or disposal.

Brandon Shores' wet flue gas desulfurization ("FGD") scrubbers produce CCBs which include fly ash, gypsum, and FGD sludge. These CCBs are stored under cover on site before being loaded onto trucks for eventual beneficial reuse or disposal.

Waste water fines are the product of CCB clean up or area wash downs and are sent to the settling basin at the internal waste water treatment plant for storage. This basin is periodically de-watered and the CCBs are allowed to dry before being dug out, loaded on trucks, and sent for disposal.

C. The volume and weight of CCBs generated during calendar year 2016, including an identification of the different types of CCBs generated and the volume of each type generated. If the space provided is insufficient, please attach additional pages in a similar format. If converting from volume to weight or weight to volume, please provide your calculations and assumptions.

**Table I: Volume and Weight of CCBs Generated for Calendar Year 2016:** Please note the change to this table from previous years, to include both the volume and weight of the types of CCBs your facility produces.

<b>Volume and Weight of CCBs Generated for Calendar Year 2016</b>				
<u>Fly Ash</u>	<u>Bottom Ash</u>	<u>Gypsum</u>	<u>FGD Sludge</u>	<u>Waste Water Fines</u>
Type of CCB	Type of CCB	Type of CCB	Type of CCB	Type of CCB
137,247	23,122	384,517	16,623	11,569
Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards	Volume of CCB, in Cubic Yards
101,906	17,169	285,504	12,342	8,590
Weight of CCB, in Tons	Weight of CCB, in Tons	Weight of CCB, in Tons	Weight of CCB, in Tons	Weight of CCB, in Tons

Additional notes:

Coal combustion byproducts (“CCB”) are reported in dry tons. Cubic yards are calculated using a conversion factor of 1 ton = 1.3468 cubic yards.

FGD sludge is generated from the operation of the FGD water treatment system.

Waste water fines are from the waste water settling basin and consist largely of fly ash and bottom ash.

D. Descriptions of any modeling or risk assessments, or both, conducted relating to the CCBs or their use that were performed by you or your company during the reporting year. Please attach this information to the report.

No modeling or risk assessments were performed in 2016.

E. Copies of all laboratory reports of all chemical characterizations of the CCBs. Please attach this information to the report.

No chemical characterizations of CCBs were conducted at Brandon Shores in 2016.

F. A description of how you disposed of or used your CCBs in calendar year 2016, identifying:

(a) The types and volume of CCBs disposed of or used (if different than described in Paragraph C above) including any CCBs stored during the previous calendar year, the location of disposal, mine reclamation and use sites, and the type and volume of CCBs disposed of or used at each site:

Fly Ash - Beneficial Reuse

95,424 tons (128,517 CY) delivered to Separation Technologies, Inc. in Baltimore, MD for use in concrete.

1,654 tons (2,228 CY) delivered to Lehigh in Union Bridge, MD for use in cement manufacturing.

21 tons (29 CY) delivered to Ashworks in Wilmington, DE for use as flow-able fill.

Fly Ash - Disposal

4,807 tons (6,474 CY) of fly ash was delivered to Fort Armistead Road – Lot 15 LLC landfill in Baltimore, MD for landfilling.

Bottom Ash - Beneficial Reuse

None.

Bottom Ash - Disposal

17,149 tons (23,096 CY) of bottom ash was delivered to Fort Armistead Road – Lot 15 LLC landfill in Baltimore, MD for landfilling.

20 tons (26 CY) of bottom ash was delivered to King George landfill in King George, VA for landfilling.

Gypsum - Beneficial Reuse

120,516 tons (162,311 CY) delivered to US Gypsum in Baltimore, MD for use in wallboard manufacturing.

49,589 tons (66,787 CY) delivered to National Gypsum in Harrisburg, PA for use in wallboard manufacturing.

3,846 tons (5,180 CY) delivered to US Gypsum in Norfolk, VA for use in wallboard manufacturing.

2,226 tons (2,998 CY) delivered to US Gypsum in Harrisburg, PA for use in wallboard manufacturing.

2,145 tons (2,889 CY) delivered to US Gypsum in Union Bridge, MD for use in wallboard manufacturing.

28,640 tons (38,572 CY) delivered to SCB International in Keystone, PA for use in cement manufacturing.

13,937 tons (18,771 CY) delivered to Lehigh in Union Bridge, MD for use in cement manufacturing.

37,305 tons (50,243 CY) delivered to Synmat in Baltimore, MD for use in cement manufacturing.

824 tons (1,110 CY) delivered to US Gypsum in Harrisburg, PA for use in cement manufacturing.

2,781 tons (3,745 CY) delivered to Old Line in Curtis Bay, MD for use in cement manufacturing.

852 tons (1,147 CY) delivered to the USDA in Crisfield, MD for use in agricultural runoff control experiments.

237 tons (319 CY) delivered to Sports Aggregate in Sunbury, PA for use in fertilizer mix.

64 tons (86 CY) delivered to Sports Aggregate in Laytonsville, MD for use in fertilizer mix.

Gypsum - Disposal

2,004 tons (2,699 CY) of gypsum was delivered to Fort Armistead Road – Lot 15 LLC landfill in Baltimore, MD for landfilling.

Gypsum – Storage

1,418 tons (1,910 CY) of gypsum that was stored on site at the end of 2015 was beneficially reused or disposed of in 2016. *(Note that these tons were accounted for in CY2015's Paragraph C and are not included in the Gypsum total in Paragraph C above. These tons are accounted for in both the Beneficial Reuse and Disposal amounts in Paragraph F above.)*

21,956 tons (29,571 CY) of gypsum was stored on site at the end of 2016.

FGD Sludge - Disposal

12,342 tons (16,623 CY) of FGD sludge was delivered to Fort Armistead Road – Lot 15 LLC landfill in Baltimore, MD for landfilling.

Waste Water Fines - Disposal

8,590 tons (11,569 CY) of waste water fines delivered to Fort Armistead Road – Lot 15 LLC landfill in Baltimore, MD for landfilling.

and (b) The different uses by type and volume of CCBs:

Fly Ash

97,078 tons (130,745 CY) of fly ash was used in concrete and cement manufacturing.

21 tons (29 CY) of fly ash was used as flow-able fill.

Bottom Ash

None

Gypsum

178,322 tons (240,164 CY) of gypsum was used in wallboard manufacturing.

1,152 tons (1,552 CY) was used for use for agriculture, agricultural runoff control experiments, and fertilizer.

83,488 tons (112,441 CY) was used in concrete and cement manufacturing.

If the space provided is insufficient, please attach additional pages in a similar format.

G. A description of how you intend to dispose of or use CCBs in the next 5 years, identifying:

(a) The types and volume of CCBs intended to be disposed of or used, the location of intended disposal, mine reclamation and use sites, and the type and volume of CCBs intended to be disposed of or used at each site:

Fly Ash

Raven projects that as much as 100,000 tons (134,680 CY) of fly ash will be generated each year for the next five years. Approximately 95,000 tons (127,946

CY) of fly ash will be beneficially used in cement and/or concrete products, and the remaining 5,000 tons (6,734 CY) will be disposed of in the Fort Armistead Road - Lot 15 LLC Landfill in Baltimore, MD.

Bottom Ash

Raven projects that approximately 20,000 tons (26,936 CY) of bottom ash will be generated each year for the next five years, of which 20,000 tons (26,936 CY) will be disposed of in the Fort Armistead Road - Lot 15 LLC landfill in Baltimore, MD.

Gypsum

Raven projects that as much as 300,000 tons (404,040 CY) of gypsum will be generated each year for the next five years, all of which will be beneficially used in drywall, cement, or concrete products, and for agricultural uses.

FGD Sludge

Raven projects that as much as 15,000 tons (20,202 CY) of FGD Sludge will be generated each year for the next five years, all of which will be disposed of in the Fort Armistead Road - Lot 15 LLC landfill in Baltimore, MD.

Waste Water Fines

Raven projects that as much as 9,000 tons (12,121 CY) of waste water fines will be generated each year for the next five years, all of which will be disposed of in the Fort Armistead Road - Lot 15 LLC landfill in Baltimore, MD.

and (b) The different intended uses by type and volume of CCBs.

Fly Ash

Approximately 95,000 tons (134,680 CY) of fly ash each year will be beneficially used in the manufacturing of cement or concrete.

Bottom Ash

Approximately 0 tons (0 CY) of bottom ash each year will be beneficially used in the manufacturing of cement or concrete.

Gypsum

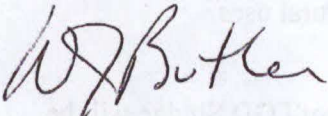
Approximately 300,000 tons (404,040 CY) of gypsum each year will be beneficially used in drywall, cement and concrete products, or agricultural uses.



Facility Name: Brandon Shores Generating Station

**CCB Tonnage Report – 2016**

**IV. Signature and Certification.** An authorized official of the generator must sign the annual report, and certify as to the accuracy and completeness of the information contained in the annual report:

This is to certify that, to the best of my knowledge, the information contained in this report and any attached documents are true, accurate, and complete.		
Signature	William Butler Authorized Representative, 410-787-5489	Date
	Name, Title, & Telephone No. (Print or Type)	3/23/2017
	wbutler@raven-power.com	
	Your Email Address	

**V: Attachments (please list):**

1. None