AES Warrior Run
we are the energy

11600 Mexico Farms Road, SE • Cumberland, MD 21502 • (301) 777-0055 • FAX (301) 777-8772

February 26, 2018

Re: CCB Report

Ms. Martha Hynson, Chief
Solid Waste Operations Division
Maryland Department of the Environment
1800 Washington Blvd.
Baltimore, MD 21230-1719

Ms. Hynson,

Please find the enclosed CCB report for AES Warrior Run, LLC. We have completed the report as required and included applicable attachments.

If there are any questions about this report, please do not hesitate to contact us.

Regards,

Kara Hawkins

Kara Hawkins
Environmental Specialist
AES Warrior Run

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Land and Materials Administration • Solid Waste Program
1800 Washington Boulevard • Suite 605 • Baltimore Maryland 21230-1719
410-537-3315 • 800-633-6101 x3315 • www.mde.maryland.gov

Coal Combustion Byproducts (CCBs)
Annual Generator Tonnage Report
Instructions for Calendar Year 2017

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 2017. 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 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.

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 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, 2018:

A. Contact information:

Facility Name: AES Warrior Run

Name of Permit Holder: AES Warrior Run, LLC

Facility Address: 11600 Mexico Farms Rd. SE
Street

Facility Address: Cumberland MD 21502
City State Zip

County: Allegany

Contact Information (Person filing report or Environmental Manager)

Facility Telephone No.: 301-777-0055 Facility Fax No.: 301-777-8772

Contact Name: Kara Hawkins

Contact Title: Environmental Specialist

Contact Address: 11600 Mexico Farms Rd. SE
Street

Contact Address: Cumberland MD 21502
City State Zip

Contact Email: kara.hawkins@aes.com

Contact Telephone No.: 301-777-0055 ext. 1105 Contact Fax No.: 301-777-8772

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:

AES Warrior Run (AES) is an electric co-generation facility located at 11600 Mexico Farms Road, S.E in Cumberland in Allegany County in Maryland. The Facility operates a 180-megawatt coal-fired steam electric cogeneration plant and a 150-ton per day food grade carbon dioxide production plant. The facility consists of an ABB CE coal-fired atmospheric fluidized bed combustion boiler (AFBC) burning bituminous coal and Number 2 fuel oil as a start-up fuel.

Selective non-catalytic reduction (SNCR) system provides supplemental control of nitrogen oxides (NOx) to the AFBC boiler design. Sulfur dioxide (SO2) emissions are controlled by the introduction of limestone into the fluidized bed of the boiler. A bag house controls particulate emissions in the boiler flue gas.

Bed ash is removed at the bottom of the boiler and is loaded into a silo for eventual removal. Fly ash is removed at the bottom of the baghouse, air heater, and boiler backpass sections and is kept segregated from the bed ash in a separate silo. Both flyash and bed ash are mixed with small amounts of service water (to control dusting) and loaded into trucks for disposal off-site.

AES commenced commercial operation on February 10, 2000, and produces electricity for distribution by the Potomac Electric Power Company. The applicable SIC Code for the facility is 4911 - Electric Services

C. The volume and weight of CCBs generated during calendar year 2017, 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.

Facility Name: AES Warrior Run

CCB Tonnage Report – 2017

Table I: Volume and Weight of CCBs Generated for Calendar Year 2017: Please note that this table includes both the volume and weight of the types of CCBs your facility produces.

Volume and Weight of CCBs Generated for Calendar Year 2017			
Fly Ash Type of CCB	Bed Ash Type of CCB	Slag Ash Type of CCB	 Type of CCB
381,432.83 Volume of CCB, in Cubic Yards	133,154.49 Volume of CCB, in Cubic Yards	6,941.07 Volume of CCB, in Cubic Yards	 Volume of CCB, in Cubic Yards
215,575.77 Weight of CCB, in Tons	86,230.40 Weight of CCB, in Tons	4,156.91 Weight of CCB, in Tons	 Weight of CCB, in Tons

Additional notes:

Slag ash consists of fly ash and bed ash as a mixture. We use the term slag ash to differentiate from the discreet fly ash and bed ash in our system.

Volumes were determined with the calculated densities of: Fly Ash = 0.57 tons/cu yd, Bed Ash = 0.65 tons/cu yd, Slag Ash = 0.60 tons/cu yd

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.

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

Facility Name: AES Warrior Run

CCB Tonnage Report – 2017

F. A description of how you disposed of or used your CCBs in calendar year 2017, 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:

2017	Fly Ash Tons	Fly Ash CuYds	Bed Ash Tons	Bed Ash CuYds	Slag Ash Tons	Slag Ash CuYds	Use
Cabin Run Mine	150,105.93	265,592.60	81,493.68	125,840.18	-	-	Mine Reclamation
ARJ Coal Mine	65,253.08	115,456.70	23.09	35.65	-	-	Mine Reclamation
Walker Brothers Coal Mine	216.76	383.53	4,713.63	7,278.65	4,156.91	6,941.07	Mine Reclamation
Total	215,575.77	**381,432.83**	86,230.40	**133,154.49**	4,156.91	**6,941.07**	

and (b) The different uses by type and volume of CCBs:
See chart above.

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:

No change, same as previous years.

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

No change, same as previous years.

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

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	Peter Bajc Plant Manager 301-777-0055 P. Bajc Name, Title, & Telephone No. (Print or Type) peter.bajc@aes.com Your Email Address	02/26/18 Date

V: Attachments (please list):

TCLP-Total Metals analysis fly & bed ash

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N. Center Ave.
Somerset, PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Monday, October 23, 2017

Michelle Stahlman
AES - WARRIOR RUN INC
11600 MEXICO FARMS SE
CUMBERLAND, MD 21502

RE: AES Warrior Ash Samples Order No.: G1710765

Dear Michelle Stahlman:

Geochemical Testing received 3 sample(s) on 10/11/2017 for the analyses presented in the following report.

There were no problems with the analyses and all QC data met NELAC, EPA, and laboratory specifications except where noted in the Case Narrative or Laboratory Results.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Timothy W. Bergstresser
Director of Technical Services

Geochemical Testing

Date: *23-Oct-17*

CLIENT: AES - WARRIOR RUN INC
Project: AES Warrior Ash Samples
Lab Order: G1710765

CASE NARRATIVE

No problems were encountered during analysis of this workorder, except if noted in this report.

Legend:

ND - Not Detected
J - Indicates an estimated value.
U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.
B - Analyte detected in the associated Method Blank
Q - Qualifier QL -Quantitation Limit DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
** - Value exceeds Action Limit
H - Method Hold Time Exceeded
MCL - Contaminant Limit

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *23-Oct-17*

CLIENT: AES - WARRIOR RUN INC
Client Sample ID: Fly Ash
C86956
Lab Order: G1710765
Project: AES Warrior Ash Samples
Sampled By: AES
Lab ID: G1710765-001
Collection Date: 9/29/2017
Matrix: ASH
Received Date: 10/11/2017 5:00:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TOTAL METALS		Analyst: RLR				EPA 3050	EPA 6010
Aluminum	42800	10		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 3:09 PM
Antimony	< 2.0	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 3:09 PM
Arsenic	65.3	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Barium	418	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Beryllium	3.20	0.10		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Boron	< 5.0	5.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Cadmium	0.6	0.2		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Chromium	46.7	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Cobalt	14.6	0.5		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Copper	43.4	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Lead	29.3	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Lithium	83.1	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Manganese	91.1	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Molybdenum	9.5	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Nickel	42.0	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Selenium	11.2	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Silver	< 0.5	0.5		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Vanadium	70.8	0.5		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
Zinc	80.6	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 1:59 AM
MERCURY		Analyst: GAK					ASTM D 6722
Mercury	0.901	0.010		mg/Kg-dry	1		10/12/17 9:04 AM
CARBONATE RESULTS		Analyst: GMG					Calculated
Calcium Carbonate	25.9			%	1		10/13/17 12:00 AM
Calcium Carbonate Equivalent	31.3			%	1		10/13/17 12:00 AM
Magnesium Carbonate	4.5			%	1		10/13/17 12:00 AM
MAJOR / MINOR ELEMENTS IN ASH		Analyst: GMG				ASTM D 6349	EPA 6010
Calcium Oxide	14.54	0.02		% Dry	2	10/12/17 2:35 AM	10/13/17 10:27 AM
Magnesium Oxide	2.14	0.02		% Dry	2	10/12/17 2:35 AM	10/13/17 10:27 AM
TCLP EXTRACTION		Analyst: MKD					EPA 1311
Extraction Fluid Used	2.0				1		10/12/17 8:00 PM
Final pH	6.3	1.0			1		10/12/17 8:00 PM
Initial pH	12.6	1.0			1		10/12/17 8:00 PM
TCLP, non-volatile	NA				1		10/12/17 8:00 PM

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I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *23-Oct-17*

CLIENT:	AES - WARRIOR RUN INC	**Client Sample ID:**	Fly Ash
Lab Order:	G1710765		C86956
Project:	AES Warrior Ash Samples	**Sampled By:**	AES
Lab ID:	G1710765-001	**Collection Date:**	9/29/2017
Matrix:	ASH	**Received Date:**	10/11/2017 5:00:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TCLP METALS		Analyst: LNG				SM 3112 B	EPA 7470
Mercury	< 0.0002	0.0002		mg/L	1	10/16/17 10:40 AM	10/16/17 2:13 PM
TCLP METALS		Analyst: GMG				EPA 200.2	EPA 6010
Aluminum	2.2	0.1		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Antimony	< 0.02	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Arsenic	< 0.02	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Barium	0.4	0.3		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Beryllium	< 0.001	0.001		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Boron	0.23	0.05		mg/L	1	10/16/17 10:30 AM	10/19/17 11:44 AM
Cadmium	< 0.002	0.002		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Chromium	0.07	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Cobalt	< 0.005	0.005		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Copper	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Lead	< 0.02	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Lithium	0.30	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Manganese	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Molybdenum	0.22	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Nickel	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Selenium	0.06	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Silver	< 0.005	0.005		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Vanadium	0.19	0.005		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM
Zinc	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:50 PM

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I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *23-Oct-17*

CLIENT:	AES - WARRIOR RUN INC	**Client Sample ID:**	Bed Ash North
Lab Order:	G1710765		C86957
Project:	AES Warrior Ash Samples	**Sampled By:**	AES
Lab ID:	G1710765-002	**Collection Date:**	9/29/2017
Matrix:	ASH	**Received Date:**	10/11/2017 5:00:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TOTAL METALS		Analyst: **RLR**				**EPA 3050**	**EPA 6010**
Aluminum	28300	10		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 3:26 PM
Antimony	< 2.0	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Arsenic	51.0	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Barium	178	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Beryllium	1.39	0.10		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Boron	< 5.0	5.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Cadmium	0.2	0.2		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Chromium	30.4	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Cobalt	6.8	0.5		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Copper	17.3	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Lead	12.4	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Lithium	65.9	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Manganese	84.1	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Molybdenum	4.1	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Nickel	18.7	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Selenium	2.5	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Silver	< 0.5	0.5		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Vanadium	43.0	0.5		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
Zinc	41.9	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:39 AM
MERCURY		Analyst: **GAK**					**ASTM D 6722**
Mercury	< 0.010	0.010		mg/Kg-dry	1		10/12/17 9:04 AM
CARBONATE RESULTS		Analyst: **GMG**					**Calculated**
Calcium Carbonate	31.5			%	1		10/13/17 12:00 AM
Calcium Carbonate Equivalent	37.7			%	1		10/13/17 12:00 AM
Magnesium Carbonate	5.2			%	1		10/13/17 12:00 AM
MAJOR / MINOR ELEMENTS IN ASH		Analyst: **GMG**				**ASTM D 6349**	**EPA 6010**
Calcium Oxide	17.66	0.02		% Dry	2	10/12/17 2:35 AM	10/13/17 10:32 AM
Magnesium Oxide	2.48	0.02		% Dry	2	10/12/17 2:35 AM	10/13/17 10:32 AM
TCLP EXTRACTION		Analyst: **MKD**					**EPA 1311**
Extraction Fluid Used	1.0				1		10/12/17 8:00 PM
Final pH	12.4	1.0			1		10/12/17 8:00 PM
Initial pH	12.0	1.0			1		10/12/17 8:00 PM
TCLP, non-volatile	NA				1		10/12/17 8:00 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *23-Oct-17*

CLIENT:	AES - WARRIOR RUN INC	**Client Sample ID:**	Bed Ash North
Lab Order:	G1710765		C86957
Project:	AES Warrior Ash Samples	**Sampled By:**	AES
Lab ID:	G1710765-002	**Collection Date:**	9/29/2017
Matrix:	ASH	**Received Date:**	10/11/2017 5:00:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TCLP METALS		Analyst: LNG				SM 3112 B	EPA 7470
Mercury	< 0.0002	0.0002		mg/L	1	10/16/17 10:40 AM	10/16/17 2:14 PM
TCLP METALS		Analyst: GMG				EPA 200.2	EPA 6010
Aluminum	< 0.1	0.1		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Antimony	< 0.02	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Arsenic	< 0.02	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Barium	0.4	0.3		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Beryllium	< 0.001	0.001		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Boron	< 0.05	0.05		mg/L	1	10/16/17 10:30 AM	10/18/17 12:40 PM
Cadmium	< 0.002	0.002		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Chromium	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Cobalt	< 0.005	0.005		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Copper	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Lead	< 0.02	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Lithium	0.31	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Manganese	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Molybdenum	0.09	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Nickel	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Selenium	< 0.02	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Silver	< 0.005	0.005		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Vanadium	0.009	0.005		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM
Zinc	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:54 PM

Laboratory Results

Geochemical Testing

Date: *23-Oct-17*

CLIENT:	AES - WARRIOR RUN INC	**Client Sample ID:**	Bed Ash South
Lab Order:	G1710765		C86985
Project:	AES Warrior Ash Samples	**Sampled By:**	AES
Lab ID:	G1710765-003	**Collection Date:**	9/29/2017
Matrix:	ASH	**Received Date:**	10/11/2017 5:00:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TOTAL METALS		Analyst: RLR				EPA 3050	EPA 6010
Aluminum	23100	10		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 3:31 PM
Antimony	< 2.0	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Arsenic	57.2	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Barium	176	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Beryllium	1.44	0.10		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Boron	25.2	5.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Cadmium	0.4	0.2		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Chromium	33.4	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Cobalt	9.1	0.5		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Copper	18.9	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Lead	9.9	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Lithium	36.2	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Manganese	118	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Molybdenum	4.7	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Nickel	23.3	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Selenium	< 2.0	2.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Silver	< 0.5	0.5		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Vanadium	50.3	0.5		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
Zinc	50.0	1.0		mg/Kg-dry	1	10/17/17 9:10 AM	10/18/17 2:44 AM
MERCURY		Analyst: GAK					ASTM D 6722
Mercury	< 0.010	0.010		mg/Kg-dry	1		10/12/17 9:04 AM
CARBONATE RESULTS		Analyst: GMG					Calculated
Calcium Carbonate	44.5			%	1		10/13/17 12:00 AM
Calcium Carbonate Equivalent	124			%	1		10/13/17 12:00 AM
Magnesium Carbonate	67.1			%	1		10/13/17 12:00 AM
MAJOR / MINOR ELEMENTS IN ASH		Analyst: GMG				ASTM D 6349	EPA 6010
Calcium Oxide	24.92	0.02		% Dry	2	10/12/17 2:35 AM	10/13/17 10:55 AM
Magnesium Oxide	3.20	0.02		% Dry	2	10/12/17 2:35 AM	10/13/17 10:55 AM
TCLP EXTRACTION		Analyst: MKD					EPA 1311
Extraction Fluid Used	1.0				1		10/12/17 8:00 PM
Final pH	12.5	1.0			1		10/12/17 8:00 PM
Initial pH	12.1	1.0			1		10/12/17 8:00 PM
TCLP, non-volatile	NA				1		10/12/17 8:00 PM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *23-Oct-17*

CLIENT:	AES - WARRIOR RUN INC	**Client Sample ID:**	Bed Ash South
Lab Order:	G1710765		C86985
Project:	AES Warrior Ash Samples	**Sampled By:**	AES
Lab ID:	G1710765-003	**Collection Date:**	9/29/2017
Matrix:	ASH	**Received Date:**	10/11/2017 5:00:00 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
TCLP METALS		Analyst: LNG				**SM 3112 B**	**EPA 7470**
Mercury	< 0.0002	0.0002		mg/L	1	10/16/17 10:40 AM	10/16/17 2:16 PM
TCLP METALS		Analyst: GMG				**EPA 200.2**	**EPA 6010**
Aluminum	< 0.1	0.1		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Antimony	< 0.02	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Arsenic	< 0.02	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Barium	0.5	0.3		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Beryllium	< 0.001	0.001		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Boron	0.08	0.05		mg/L	1	10/16/17 10:30 AM	10/19/17 11:48 AM
Cadmium	< 0.002	0.002		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Chromium	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Cobalt	< 0.005	0.005		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Copper	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Lead	< 0.02	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Lithium	0.14	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Manganese	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Molybdenum	0.09	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Nickel	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Selenium	< 0.02	0.02		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Silver	< 0.005	0.005		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Vanadium	0.009	0.005		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM
Zinc	< 0.01	0.01		mg/L	1	10/16/17 10:30 AM	10/17/17 2:59 PM