

Coal Combustion Residuals (CCR) Closure Plan Solid Waste Permit Number WV0110256

Virginia Electric and Power Company
Mount Storm Power Station
Phase B Disposal Area
Grant County, West Virginia

GAI Project Number: C141182.02

October 2016



Prepared by: GAI Consultants
Murrysville Office
4200 Triangle Lane
Export, Pennsylvania 15632

Prepared for: Virginia Electric and Power Company
5000 Dominion Boulevard
Glen Allen, Virginia 23060

Coal Combustion Residuals (CCR) Closure Plan Solid Waste Permit Number WV0110256

Virginia Electric and Power Company
Mount Storm Power Station
Phase B Disposal Area
Grant County, West Virginia
GAI Project Number: C141182.02

October 2016

Prepared for:
Virginia Electric and Power Company
5000 Dominion Boulevard
Glen Allen, Virginia 23060

Prepared by:
GAI Consultants
Murrysville Office
4200 Triangle Lane
Export, Pennsylvania 15632

Table of Contents

Certification/Statement of Professional Opinion	ii
Acronyms.....	iii
1.0 Introduction	1
1.1 Regulatory Background	1
1.2 Site Description	1
1.3 Closure Description	1
1.4 Maintenance and Runoff Minimization	2
2.0 Closure Timeframe	2
3.0 Preparation for Closure of Landfill.....	2
3.1 Site Configuration	2
3.1.1 CCR Placement	2
3.1.2 Estimated CCR Volume.....	2
3.2 Structures and Equipment	3
4.0 Facility Closure	3
4.1 Compacted Soil Cover System.....	3
4.2 Final Slopes	3
4.3 Runoff Controls.....	3
5.0 CCR Closure Implementation.....	4
5.1 Security.....	4
5.2 Notification	4
5.3 Certification	4
6.0 References.....	5

© 2016 GAI CONSULTANTS

Certification/Statement of Professional Opinion

The Coal Combustion Residuals Closure Plan (Plan) for the Mount Storm Power Station Phase B Disposal Area was prepared by GAI Consultants, Inc. (GAI). The Plan was based on certain information that, other than for information GAI originally prepared, GAI has relied on, but not independently verified. This Certification/Statement of Professional Opinion is therefore limited to the information available to GAI at the time the Plan was written. On the basis of and subject to the foregoing, it is my professional opinion as a Professional Engineer licensed in the State of West Virginia that the Plan has been prepared in accordance with good and accepted engineering practices as exercised by other engineers practicing in the same discipline(s), under similar circumstances, at the same time, and in the same locale. It is my professional opinion that the Plan was prepared consistent with the requirements of section 257.102 the United State Environmental Protection Agency's "Standard for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," published in the Federal Register on April 17, 2015 with an effective date of October 19, 2015 (40 CFR 257 Subpart D).

The use of the words "certification" and/or "certify" in this document shall be interpreted and construed as a Statement of Professional Opinion and is not and shall not be interpreted or construed as a guarantee, warranty, or legal opinion.

GAI Consultants, Inc.



John R. Klamut, P.E.
Engineering Manager

Date 10/14/2016



Acronyms

CCB	Coal Combustion Byproducts
CCR	Coal Combustion Residuals
CCR Closure Plan	Phase B Disposal Area CCR Closure Plan
CCR Rule	"Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments" 40 CFR 257(2015)
CFR	Code of Federal Regulations
CSR	Code of State Rules
Dominion	Virginia Electric and Power Company d/b/a Dominion
DWWM	Division of Water and Waste Management
EPA	United States Environmental Protection Agency
FGD	Flue gas desulfurization
GAI	GAI Consultants, Inc.
Permit	Class F Industrial Landfill Facility Permit No. WV0110256
Phase B Station	Phase B Disposal Area Mount Storm Power Station
WVDEP	West Virginia Department of Environmental Protection
WVSWMR	West Virginia Solid Waste Management Rules

1.0 Introduction

This Coal Combustion Residuals Closure Plan (CCR Closure Plan) provides the method and design for closure of the Phase B Disposal Area (Phase B) located at the Mount Storm Power Station (Station) in Grant County, West Virginia. Phase B is permitted under the Station's West Virginia Department of Environmental Protection (WVDEP) Class F Industrial Landfill Facility Permit No. WV0110256 (Permit).

The closure of Phase B will be completed in accordance with a West Virginia Solid Waste Facility Permit that meets the requirements of the United States Environmental Protection Agency's (EPA's) "Disposal of Coal Combustion Residuals from Electric Utilities" (CCR Rule).

1.1 Regulatory Background

Phase B is classified as an existing landfill under the CCR Rule and a Class F Industrial Facility regulated by the WVDEP, Division of Water and Waste Management (DWWM), under 33 Code of State Rules (CSR) Title 1.

Closure of Phase B will be in accordance with the CCR Rule and applicable sections of the West Virginia Solid Waste Management Rule (WVSWMR).

1.2 Site Description

The Station, including Phase B, is owned by Virginia Electric and Power Company d/b/a Dominion Virginia Power (Dominion). Phase B is located on Dominion property at the Station in Grant County, West Virginia (39°11'05"N 79°17'05"W), and is generally bounded by Mount Storm Lake on the east and south, Interstate 48 on the west, and West Virginia Route 93 on the north.

Phase B was permitted by Dominion in 1986 as a component of the Station's ash disposal system. Phase B receives coal combustion byproducts (CCB), which include coal combustion residuals (CCR) such as fly ash, bottom ash, and boiler slag. Materials stored in Phase B are listed in the Phase B Permit. The area permitted for CCR disposal is approximately 155 acres.

A CCR fugitive dust control plan has been implemented for the Station in accordance with the CCR Rule § 257.80 and will be amended to incorporate closure activities.

1.3 Closure Description

Phase B will be closed with the CCR material in place. After CCR is placed to the final design grades, the area will be capped and covered with a final cover consisting of an 18-inch thick soil protective cover layer and 6-inch thick vegetative support layer (collectively known as the compacted soil cover system).

The proposed closure sequence is anticipated to consist of:

- Initiation of closure construction of Stage 1, by grading the area to the necessary subgrade and installing the compacted soil cover system.
- Closure of Stage 1, by installing the compacted soil cover system.
- Closure of Stage 2, by installing the compacted soil cover system.
- Installation of final stormwater controls.

The final cover system will be designed and constructed to comply with 40 CFR § 257.102(d)(3).

1.4 Maintenance and Runoff Minimization

The Phase B Closure Plan will minimize maintenance, runoff, and the potential for release of waste materials by closing Phase B through the construction of a compacted soil cover system (see Section 4.1).

The compacted soil cover system will minimize the exposure of CCR to the environment. Runoff from the closed Phase B will be directed to collector ditches and site stormwater sedimentation ponds. With the exception of riprap-lined, concrete-lined, and turf mat reinforced drainage channels and gravel access roads, the closed Phase B will be covered with a vegetative soil layer to minimize the runoff volume released from the site and the potential for erosion of the cover system. Stormwater runoff from the closed Phase B will not come into contact with or contain CCR material.

2.0 Closure Timeframe

The proposed construction sequencing for Phase B is covered in Section 3.1.1. Sequenced construction is necessary because Phase B will continue to receive CCR through 2047. Closure is anticipated to be completed in stages as landfill sections reach final grade and to be completed within six months of the final receipt of waste. The date for initiation of closure has not been planned and is dependent upon Station operations, outages, electricity demand, weather, fuel, and other factors. Based on current disposal rates, the estimated date for completing closure is 2047.

The major project milestones based on current disposal rates include:

- 2Q 2047 – Mobilize contractor and initiate installation of the cover system
- 3Q 2047 – Complete the installation of the cover system
- 3Q 2047 – Complete closure certification

3.0 Preparation for Closure of Landfill

3.1 Site Configuration

3.1.1 CCR Placement

To achieve final closure grades at Phase B, CCR placement will be sequenced in Stages which will be closed as final grades are reached. CCR is placed with typical side slopes of three horizontal to one vertical (3:1).

After placement and compaction, the CCR material will be capped with compacted soil and then covered with soil and vegetated. Benches are constructed every 15 vertical feet of placement height on the 3:1 slopes. Phase B is designed with a one to two percent minimum top slope (to prevent ponding). Phase B will be graded to drain to existing stormwater collector ditches to direct flow to the sedimentation ponds.

3.1.2 Estimated CCR Volume

The total volume of material in Phase B at the time of final closure is estimated to be 26.4 million cubic yards.

The total volume of CCR that will be placed in Phase B is variable and is dependent upon Station operations, outages, electricity demand, weather, fuel, and other factors. Because of this uncertainty, after the closure is complete a record drawing will be developed and submitted to the WVDEP to show the actual volume of CCR placed in Phase B.

3.2 Structures and Equipment

Demolished structures and equipment that do not remain in place will be disposed of off-site. Other structures and equipment will be abandoned in place.

4.0 Facility Closure

4.1 Compacted Soil Cover System

This CCR Closure Plan includes the installation of a compacted soil cover system meeting the requirements of § 257.102(d)(3) of the CCR Rule. The compacted cover system will be placed over all CCR material within Phase B. The maximum area to be capped and covered with the compacted soil cover system is estimated to be approximately 155 acres.

The compacted soil cover system will consist of the following (listed from bottom to top):

- A prepared CCR or soil subgrade, stripped of vegetation;
- A compacted soil cover layer, meeting the requirements of CCR Rule § 257.102(d)(3), which will serve as the infiltration layer with permeability meeting the permeability specifications of CCR Rule § 257.102(d)(3)(i)(A); and
- Six inches of soil which will serve as the erosion and vegetative support layer.

Protective linings such as concrete, rip-rap, and fabric-formed concrete drainage channels, or crushed stone road surfacing, will be identified and installed in specific locations. At these locations, the thickness of the protective covering will contribute towards the overall thickness of the erosion and vegetative support layer. Vegetation is not necessary in locations where a protective covering is installed.

Excessive soil loss and sedimentation will be prevented by:

- Sequencing closure to minimize the amount of bare cover soil exposed;
- Providing localized erosion and sediment control features downgradient of disturbed areas; and
- The use of stormwater sedimentation ponds as erosion and sedimentation control features while upgradient areas are stabilized.

4.2 Final Slopes

Final slopes at the closed Phase B will be 33 percent maximum and 1 percent minimum. The 33 percent slope areas will feature benches every 15 vertical feet.

4.3 Runoff Controls

Runoff from within Phase B will be conveyed toward collector ditches and ultimately to the sedimentation ponds. Stormwater channels will be lined with either rip-rap, concrete, fabric-formed concrete, or vegetated turf reinforcement mat.

Design calculations for the channels are based on the 25-year, 24-hour storm event.

The existing sedimentation ponds will remain in service as the primary erosion and sedimentation control features for Phase B.

5.0 CCR Closure Implementation

5.1 Security

Signs will be posted at the locking gates at Phase B or Station access points and unauthorized entrance will be prohibited. Vehicle access adjacent to the gate will be denied by physical barriers (surface water channels, post barricades, or severe slopes).

5.2 Notification

Within 30 days of WVDEP's final approval of the closure, deed notations will be implemented according to § 257.102(i) of the CCR Rule. Within 30 days of recording the notation, a notification stating that the deed notation has been recorded, will be prepared and placed in the Phase B Facility's operating record and posted to the Company's publicly available website.

5.3 Certification

In accordance with § 257.102(h) of the CCR Rule, within 30 days of the completion of the closure activities, certification will be provided indicating that closure occurred in accordance with this CCR Closure Plan.

6.0 References

40CFR257, Subpart D—*Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments*, 2015.

GAI Consultants. *Application for Class F Industrial Waste Landfill Facility, Life of Station Ash Disposal Facility – Phase A & B*; December 1990.

State of West Virginia, Department of Environmental Protection. *Solid Waste National Pollutant Discharge Elimination System Permit No. WV0110256*; April 2014.

United States Environmental Protection Agency (EPA). 40 CFR Parts 257 and 261, *Hazardous and Solid Waste Management Disposal System; Disposal of Coal Combustion Residual from Electric Utilities, Final Rule*; April 2015.