



October 8, 2018

Project C141182.04

Mr. Dennis Slade, CHMM  
Supervisor – Corporate Waste and Remediation  
Dominion Energy Services, Inc.  
5000 Dominion Boulevard  
Glen Allen, Virginia, 23060

**Unstable Areas Location Restriction Certification  
Phase A FGD By-product Facility  
Mt. Storm Power Station  
Grant County, West Virginia**

Dear Mr. Slade:

At the request of Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion), GAI Consultants, Inc. (GAI) reviewed the Phase A Flue Gas Desulfurization (FGD) By-product Facility (Facility) located at the Mt. Storm Power Station for compliance with 40 Code of Federal Regulations (CFR) §257.64. According to § 257.64, existing CCR landfills must not be located in unstable areas unless it can be demonstrated that “recognized and generally accepted good engineering practices have been incorporated into the design of the CCR unit to ensure that the integrity of the structural components of the CCR unit will not be disrupted” (EPA, 2015). At a minimum, this demonstration must consider: “(1) On-site or local soil conditions that may result in significant differential settling; (2) On-site or local geologic or geomorphologic features; and (3) On-site or local human-made features or events (both surface and subsurface)” (EPA, 2015).

This demonstration was completed by evaluating information included in the Facility’s Solid Waste Permit Application (GAI, 1993). The Permit Application includes the results of site investigations and analyses that were completed to permit the construction of the facility with the West Virginia Department of Environmental Protection. The investigations and analyses considered the soil conditions, geology, and human-made features at the Facility. A summary is provided below.

**On-site or Local Soil Conditions**

GAI reviewed soil information obtained from United States Department of Agriculture soil maps, and test pits and borings completed around the landfill. Based on this information, the local soils are primarily of residual and colluvial origin consisting of silts and clays with varying amounts of rock fragments. The depth to rock varies from 5 feet to 25 feet. Minor occurrences of alluvial soil, including silty and sandy sediments, are present in and around the locations of former channels (GAI, 1993). Based on GAI’s review of this information, on-site or local soil conditions that would result in significant differential settlement or unstable conditions were not found.

The Technical Specifications for the Facility include engineering requirements for a bottom-liner system, subgrade preparation, and compaction of structural fill. In addition, stability analyses and settlement calculations were completed as part of the engineering design presented in the 1993 solid waste permit application. These analyses resulted in satisfactory factors of safety for stability and predicted settlement. Based on this information, the integrity of the structural components of the CCR landfill will not be disrupted by the on-site or local soils.

**On-site or Local Geologic or Geomorphologic Features**

Strata of the Pennsylvanian Age Conemaugh and Allegheny Series are found at the site. The foremost stratigraphic unit is the Upper Freeport Coal. The Upper Freeport Coal is deep mined in the area at depths of 60 to 200 feet. Stratigraphic units beneath the Freeport Coal include, in descending order,

the Bolivar Claystone, the Upper Freeport Sandstone, the Lower Freeport Coal, and the Lower Freeport Claystone. Stratigraphic units overlying the Upper Freeport Coal are, in ascending order, the Uffington Claystone, the Lower and Upper Mahoning Sandstone, the Brush Creek Claystone and Siltstone and Buffalo Sandstone (GAI, 1993).

GAI reviewed geologic information obtained from test pits and borings completed around the Facility in 1984 and 1993. Indications of karst or other unstable geomorphologic features were not encountered. The geologic or geomorphologic information reviewed did not suggest the presence of unstable areas, which will disrupt components of the Facility.

#### **On-site or Local Human-made Features or Events**

The Facility is located above underground mine workings of the Laurel Run Mining Company's Mine No. 1. The mine workings are in the approximately 6-foot-thick Upper Freeport Coal seam located at a depth of 60 to 200 feet below ground surface. An evaluation of mine subsidence was performed as part of the design for the Facility. The mine subsidence evaluation can be found in Appendix F, Section 6.6 of the solid waste permit application (GAI, 1993). According to the report, it is unlikely significant subsidence will take place in the future, based on the subsidence monitoring program of other sections of the same mine workings showing that residual subsidence was completed within a year or so of completion of mining. In addition, factors of safety of the remaining pillars against crushing are sufficiently high. Based on the subsidence analysis, the integrity of the structural components of the CCR Unit will not be disrupted by on-site or local human-made features or events.

#### **References**

GAI Consultants, Inc. (GAI), 1993. *Application for Permit Amendment*, Permit No. IWL-6314-86, Phase A FGD By-Product Facility, Mt. Storm Power Station, Grant County, West Virginia. Submitted to the West Virginia Department of Commerce, Labor and Environmental Resources, Division of Environmental Protection. October 1993.


United States Environmental Protection Agency (EPA), 2015. *40 CFR Parts 257 and 261 Hazardous and Solid Waste Management Disposal System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, April 17.

#### **Conclusion**

GAI has reviewed the above-mentioned documents in relation to the requirements of 40 CFR §257.64, Unstable Areas. The documents show the Phase A FGD By-product Facility, as designed and constructed, meets the requirements of the regulation.

Sincerely,

**GAI Consultants, Inc.**

  
James F. Shields, P.E.  
Assistant Engineering Manager

  
John Klamut, P.E.  
Engineering Manager

JFS:JK/djz

Attachments: Attachment 1 (Unstable Areas Certification)

October 8, 2018  
Project C141182.04

**ATTACHMENT 1**  
**UNSTABLE AREAS CERTIFICATION**



Murrysville Office  
 4200 Triangle Lane  
 Export, Pennsylvania 15632

T 724.387.2170  
 F 724.387.2265

October 8, 2018

**Unstable Areas Certification (40 CFR §257.64(c))  
 Phase A FGD By-Product Facility  
 West Virginia Solid Waste/NPDES Permit #WV0110256  
 Mt. Storm Power Station  
 Grant County, West Virginia**

EPA's "Disposal of Coal Combustion Residuals from Electric Utilities" Final Rule, 40 Code of Federal Regulations CFR Section 257.64, requires the owner and operator of an existing Coal Combustion Residuals (CCR) unit to obtain a certification from a qualified professional engineer stating that the CCR unit demonstration meets the requirements of 40 CFR Section 257.64.

**CERTIFICATION**

Based on review of the requirements described in 40 CFR Section 257.64 and documentation associated with the Facility's Solid Waste/National Pollutant Discharge Elimination System Permit #WV0110256, it is my professional opinion, as a Professional Engineer registered for practice in the State of West Virginia, that the Phase A FGD By-product Facility meets the requirements of 40 CFR Section 257.64 (unstable areas).

40 CFR Section 257.64 is from the United States Environmental Protection Agency's "CCR Rule" published in the Federal Register on April 17, 2015 with an effective date of October 19, 2015.

This Professional Engineer's Certification is limited to the information available to GAI at the time this report was prepared. 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 Klamut, P.E.  
 Engineering Manager

Date: 10/08/2018



WV PE License Number: 20866