

# Fort Martin Landfills Unstable Areas Demonstration

Monongahela Power Company, A FirstEnergy Company  
Fort Martin Power Station  
Maidsville, Monongalia County, West Virginia

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Prepared for:  
Monongahela Power Company, A FirstEnergy Company  
5001 Nasa Boulevard  
Fairmont, West Virginia 26554

Prepared by:  
GAI Consultants, Inc.  
Murrysville Office  
4200 Triangle Lane  
Export, Pennsylvania 15632-1357

Report Authors:

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K. Ron Harris, PE  
Assistant Engineering Manager

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Arica L. DiTullio, PE  
Engineering Manager

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## Certification/Statement of Professional Opinion

The Unstable Areas Demonstration (Demonstration) for the Fort Martin Landfill Facility was prepared by GAI Consultants, Inc. (GAI). The Demonstration was based on certain information that, other than for information GAI originally prepared, GAI has relied on, but not independently verified. Therefore, this Certification/Statement of Professional Opinion is limited to the information available to GAI at the time the Demonstration 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 Demonstration 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, and at the time and in the same locale. It is my professional opinion that the Location Restrictions Demonstration was prepared consistent with the requirements of the United States Environmental Protection Agency's "Standards 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.

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.



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Kenneth R. Harris, PE  
Assistant Engineering Manager



## 1.0 Introduction

The Fort Martin Power Station (Station) is a coal-fired electric generating station located in Madsville, in the Cass District of Monongalia County, West Virginia (WV). The captive landfill facility at the site accepts coal combustion residuals (CCRs) from the Station. The facility accepts gypsum, fly ash, bottom ash, and other approved ancillary materials. The Fort Martin Landfill (Landfill) is owned and operated by Monongahela Power Company. The approximate center of the Landfill is located at coordinates 39° 42' 46" north latitude, and 79° 56' 33" west longitude. The Landfill currently operates under WV Department of Environmental Protection (WVDEP) Solid Waste/National Pollutant Discharge Elimination System (NPDES) Water Pollution Control Permit No. WV0075752.

The Landfill consists of two separate areas: the original area south of the haul road, the Fort Martin Landfill (Original Landfill), and the expansion area north of the haul road, the Fort Martin Expansion Area Landfill (collectively, the "Landfills").

This Demonstration was prepared in accordance with the applicable requirements [§ 257.64(a)] of the United States Environmental Protection Agency's 40 Code of Federal Regulations (CFR) Part 257, Criteria for Classification of Solid Waste Disposal Facilities and Practices (CCR Rule).

## 2.0 Unstable Areas Demonstration

Pursuant to 40 CFR § 257.64, an existing CCR unit must not be located in an unstable area unless the owner or operator demonstrates 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. This Demonstration will be maintained in the facility's operating record in accordance with § 257.64(e).

### 2.1 Demonstration Overview

The Demonstration includes descriptions of the following factors used to determine that the CCR unit is not located in an unstable area:

- on-site or local soil conditions that may result in significant differential settlement;
- on-site or local geologic or geomorphic features; and
- on-site or local human-made features or events (both surface and subsurface).

These factors were evaluated based on the following information:

- United States Geological Survey (USGS) topographic maps (current and historic);
- landslide maps;
- geologic maps;
- mine maps;
- coal resource maps;
- United States Department of Agriculture (USDA) soil reports;
- karst maps;
- aerial photographs (current and historic); and
- as-built construction and permit documents.

The documents were reviewed to determine if the CCR unit is located in an unstable area. The following sections provide evaluation of on-site and local conditions related to the Landfills.

### **2.1.1 On-Site or Local Soil Conditions**

No unanticipated settlement nor significant differential settlement of the Landfills were observed during annual (2015, 2016, and 2017) and weekly (April 2016 through September 2018) inspections, both of which are required by the CCR Rule.

Historically, no unanticipated settlement nor significant differential settlement has been reported in past documented Landfill inspections. CCR placement techniques typically used reduce the likelihood of differential settlement.

The on-site presence of landslide prone soils was researched by reviewing available USDA Soil Reports. The USDA Soils Report for Monongalia County, WV defines the on-site soils by origin. The majority of the existing site soils are residual in nature. Residual soils are soils that form in-situ by weathering of bedrock. One on-site soil was classified as an alluvial deposit which was formed by stream deposition. No colluvium type soils, which are formed by down slope movement of existing soils via landslides, soil creep, etc., and are generally slide-prone, were identified in the USDA Soils Report for this area. Moreover, there are no significant deposits of unconsolidated sediments on-site or in the vicinity of the Landfills. Therefore, based on site research, the Landfill area should not be prone to significant differential settlement nor landslides.

The Landfills were designed based on numerous subsurface investigations.

### **2.1.2 On-Site or Local Geologic or Geomorphologic Features**

A review of the August 2016 *West Virginia Tax Districts Containing Karst Terrain* map reveals that the Landfills reside in an area with no sinkholes, subsidence, caverns, nor karstic rock formations. Furthermore, the 2013 *Bedrock Geologic Map of the Morgantown North Quadrangle* shows that the rocks below the Landfills are comprised of the Monongahela and Conemaugh Groups, both of which do not contain rocks associated with karst terrain formation.

Current and historic topographic maps and aerial photographs were reviewed to determine whether on-site or local geomorphic features exist or existed in the past that could create an unstable area. The documents evaluated did not identify any of these features.

### **2.1.3 On-Site or Local Human-Made Features or Events (both Surface and Subsurface)**

Permit documents, geologic maps, USGS topographic maps, mine maps, and coal resources maps were reviewed for evidence of surface and deep mining. Mine maps from the WV Geologic and Economic Survey and USGS topographic maps indicate that no surface mining or deep mining has occurred below or within 1,500 feet of the Landfills. Additionally, a review of boring logs around the landfill resulted in evidence of intact (i.e. unmined) coal seams.

## **3.0 Conclusion**

Recognized and generally accepted good engineering practices have been incorporated into the design and construction of the Landfills to reduce the potential for disruption of the structural components of the Landfills. GAI reviewed the available documents to determine if the existing Landfills were constructed in an unstable area. The soil, geologic, geomorphologic, and human-made features evaluated show that the Landfills are not located in an unstable area, or were addressed as part of the engineering design and construction of the Landfills.

## 4.0 References

- GAI Consultants, Inc. 2018. *Federal CCR 7-Day Inspection Forms*. April 2016 through September 2018.
- GAI Consultants, Inc. 2017. *2017 Annual Inspection Report*, Fort Martin CCB Landfill. December 2017.
- GAI Consultants, Inc. 2016. *2016 Annual Inspection Report*, Fort Martin CCB Landfill. October 2016.
- GAI Consultants, Inc. 2015. *2015 Annual Inspection Report*, Fort Martin CCB Landfill. January 2016.
- GAI Consultants, Inc. 2013. *Permit Renewal Application, Solid Waste/NPDES Water Pollution Control Permit No. WV0075752*. February 2013.
- GAI Consultants, Inc. 2011. *Active Landfill Permit Compliance Evaluation, Fort Martin Power Station*. July 8, 2011.
- Google Maps. 2016. Aerial photographs. October 10, 2016.
- L. Robert Kimball & Associates. 1984. *Final Design Report for the Ash Disposal Haulroad, Ft. Martin Power Station, Monongalia County, West Virginia*.
- Potesta & Associates, Inc. 2006. *Supplemental Information for Permit Renewal Application, Expansion of Class F Industrial Landfill Facility Solid Waste/NPDES Water Pollution Control Permit No. 0075752, Fort Martin Power Station*. December 29, 2006.
- RMC Consultants, Inc. 1983. *Final Report Volume 1, Geotechnical Evaluation of the Ash Disposal System, Fort Martin Power Station, Monongalia County, WV*. March 1983.
- United States Department of Agriculture. 2016. *Natural Resources Conservation Service, Custom Soil Resource Report for Marion and Monongalia Counties, West Virginia*. October 13, 2016.
- United States Environmental Protection Agency. 2015. *40 CFR Parts 257 and 261, Hazardous and Solid Waste Management System, Disposal of Coal Combustion Residuals from Electric Utilities*. April 17, 2015.
- United States Geological Survey. 1994. Morgantown North, West Virginia-Pennsylvania 7.5-Minute Series Topographic Quadrangle.
- United States Geological Survey. 1976. Morgantown North, West Virginia-Pennsylvania 7.5-Minute Series Topographic Quadrangle.
- United States Geological Survey. 1957. Morgantown North, West Virginia-Pennsylvania 7.5-Minute Series Topographic Quadrangle.
- West Virginia Geologic and Economic Survey. 2016. *Coal Bed Mapping Program*. <http://www.wvgs.wvnet.edu/www/coal/cbmp/coalims.html>; October 14, 2016.
- West Virginia Geologic and Economic Survey. 2016. *West Virginia Tax Districts Containing Karst Terrain*, [http://www.wvgs.wvnet.edu/www/geology/Karst\\_Terrain\\_Potential.html](http://www.wvgs.wvnet.edu/www/geology/Karst_Terrain_Potential.html); August 18, 2016.
- West Virginia Geologic and Economic Survey. 2013. *Bedrock Geologic Map of the Morgantown North Quadrangle West Virginia, 7.5-Minutes Series*.