



# **CCR COMPLIANCE LOCATION RESTRICTIONS DEMONSTRATION REPORT KEYSTONE ASH DISPOSAL SITE**

Prepared for:



GenOn Northeast Management Company  
Keystone Generating Station  
Shelocta, Pennsylvania

Prepared by:

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## FIGURES

Figure 1 – Site Location Plan



## 1.0 INTRODUCTION AND PURPOSE

GenOn Northeast Management Company (GenOn) operates the coal-fired Keystone Generating Station located in Shelocta, Pennsylvania. The Station utilizes the Keystone Ash Disposal Site (Ash Disposal Site) located directly north of the generating station, for the purpose of disposing coal combustion residuals (CCR).

In 2015, the *Disposal of Coal Combustion Residuals from Electric Utilities Final Rule* (CCR Rule) was enacted within the Federal Register under 40 CFR §257. The CCR Rule establishes technical requirements for CCR landfills and surface impoundments under Subtitle D of the Resource Conservation and Recovery Act (RCRA), which is the primary law regulating solid waste. Multiple location restrictions are identified for landfills and surface impoundments to ensure that they are not placed in environmentally sensitive areas. These location requirements are defined under 40 CFR §257.60 through §257.64.

Per the requirements of §257.64, CCR landfills cannot be located within an unstable area. This report has been prepared to demonstrate that the Ash Disposal Site is appropriately located to comply with this location restriction. Demonstration of compliance with §257.64 is required to be placed in the facility's operating record [§257.105(e)] by October 17, 2018. In addition, the owner or operator must notify the State Director [§257.106(e)] that this demonstration has been placed in the operating record and on the owner or operator's publicly accessible CCR internet site [§257.107(e)].

## 2.0 OVERVIEW OF LANDFILL

The collective Ash Disposal Site consists of the contiguous East Valley and West Valley components and is operated/maintained in accordance with Pennsylvania Department of Environmental Protection (PADEP) Solid Waste Permit No. 300837. Stage I of East Valley was constructed first and became operational in 1985. Stage I was initially constructed in the northern part of East Valley, with Stage II being constructed in the southern half of East Valley and vertically expanding over the Stage I area. West Valley comprises Stage III of the Ash Disposal Site. Active operations are ongoing in Stage III of the West Valley and Stage II of East Valley.

Stage IV of the disposal site is permitted and in the early stages of construction. It is being constructed in the southern part of West Valley and serves as a horizontal and vertical expansion of the Stage III area. When fully developed conditions are reached, Stage IV will vertically expand over Stage III as well as the western limits of East Valley (Stage I and Stage II). The general location of the Ash Disposal Site is shown on **Figure 1**.

## 3.0 LOCATION DEMONSTRATION

### 3.1 Unstable Areas (§257.64(a))

*Per §257.64 of the Rule, "an existing or new CCR landfill, existing or new CCR surface impoundment, or any lateral expansion of a CCR unit must not be located in an unstable area unless the owner or operator demonstrates by the dates specified in paragraph (d) of this section 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."*



APTIM evaluated the location of the Ash Disposal Site for the presence of on-site or local unstable areas as defined in §257.53. Evaluation of the conditions listed in §257.64(b)(1)-

(3) were evaluated and are discussed in the following subsections. Based on this evaluation, APTIM concludes that the Ash Disposal Site is not located within an unstable area and is compliant with the requirements of §257.64(a).

*The owner or operator must consider all of the following factors, at a minimum, when determining whether an area is unstable:*

### **3.1.1 Unstable Factors Considered: Differential Settling (§257.64(b)(1))**

*On-site or local soil conditions that may result in significant differential settling;*

The Ash Disposal Site is underlain by a layer of interbedded sandstone, siltstone, shale, claystone, and the bedrock which consists of the Glenshaw Formation of the Conemaugh Group. The soil zone beneath the Ash Disposal Site is generally composed of silty sand and silty clay to clayey silt with some sand and rock fragments. This soil zone ranges from non-existent to approximately 20 feet thick with a typical thickness of 3 to 7 feet. Based upon review of boring logs and known geology of this area, it has been determined that they are not likely loess deposits which can be collapsible under applied loads. Additionally, based on the current topography and prior annual inspections completed by the certifying engineer, no areas of significant differential settlement have been observed. Based on this information, APTIM believes the on-site soils do not constitute an unstable condition and will not cause excessive settlement of the Ash Disposal Site.

### **3.1.2 Unstable Factors Considered: Geologic/Geomorphologic Features (§257.64(b)(2))**

*On-site or local geologic or geomorphologic features;*

The Ash Disposal Site is underlain by rocks of the Glenshaw Formation, in which no karst development is known to have occurred. The Glenshaw Formation is typically about 300 feet thick and comprised of interbedded sandstone, siltstone, shale, and claystone. Four thin marine limestone beds are present in the Glenshaw Formation including the Ames, Woods Run, Pine Creek, and Brush Creek. The Ames, Woods Run, and Pine Creek limestone beds are typically in the range of 6 inches to 3 feet thick and are not conducive to karst development. The Brush Creek limestone bed can be up to 10 feet thick, but it commonly contains silt and clay and is also not conducive to karst development. The uppermost 150 feet of the Allegheny Group underlying the Glenshaw Formation is also largely comprised of clastic sedimentary rocks, including the Butler and Freeport Sandstones. No carbonate beds capable of karst development are present in the upper part of the Allegheny Group. The absence of carbonate beds capable of karst development in either the Glenshaw Formation or in the rock units of the upper portion of the Allegheny Group leads to the conclusion that no on-site or local geologic or geomorphic features capable of producing unstable conditions exist within the area of the Ash Disposal Site.



### **3.1.3 Unstable Factors Considered: Human-made Features or Events (§257.64(b)(3))**

*On-site or local human-made features or events (both surface and subsurface).*

Deep mining of the Upper Freeport Coal has occurred beneath the Ash Disposal Site. According to a study conducted by John T. Boyd Company, the Upper Freeport Coal was mined from the Lester Walker, Strong Quality, and Emilie underground mines. Mining operations ceased in at the Lester Walker and Strong Quality mines in approximately 1966 and in 1999 at the Emilie Mine. The potential for mine collapse and subsidence has been previously evaluated and reported in GAI Consultants, Inc. (GAI) Major Permit Modification Application (Permit Application) for the West Valley area prepared in July 1996.

As part of the 1996 Permit Application, GAI calculated the strain on the Ash Disposal Site bottom liner system that would result from a mine subsidence event beneath the Ash Disposal Site. The calculation considered the room and pillar method of mining that was performed, thickness of the mine void, the amount of overburden above the mine, mechanical and physical properties of the mine gob and overburden material, and the loads applied by the Ash Disposal Site to the remaining pillars in the mines. Ultimately, GAI concluded that the tensile ground strain is unlikely to exceed a maximum strain greater than the strength properties of the bottom liner system, therefore key environmental safeguards within the bottom liner system will not be adversely impacted. The certifying engineer has reviewed this information and concurs with the analysis and findings. Therefore, it may be concluded that the site will not be impacted by adverse effects related to deep mining or human-made features.

Based on the evidence presented above in Section 3.1.1 through 3.1.3, the Ash Disposal Site is not located in an unstable area and meets the requirements of §257.64(b)(1)-(3), and in turn, the requirements of §257.64(a).

## **4.0 SUMMARY AND CONCLUSIONS**

It is the opinion of APTIM that the Ash Disposal Site is appropriately located to conform with the location restriction established in §257.64.



**5.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION (§257.64(c))**

I, the undersigned Professional Engineer licensed in the Commonwealth of Pennsylvania, am familiar with the requirements of the CCR Rule Section 257. It is my professional opinion that the CCR landfill described in this report meet the requirements of § 257.64(a). The basis of this professional opinion is described within this report and is limited to the available information known to APTIM. This professional opinion is not to be interpreted or construed as a guarantee, warranty, or legal opinion.

Name of Professional Engineer: Richard Southorn, P.E., P.G.

Company: APTIM

PE Registration State: Pennsylvania

PE Registration Number: PE085411

Professional Engineer Seal:



## 6.0 REFERENCES

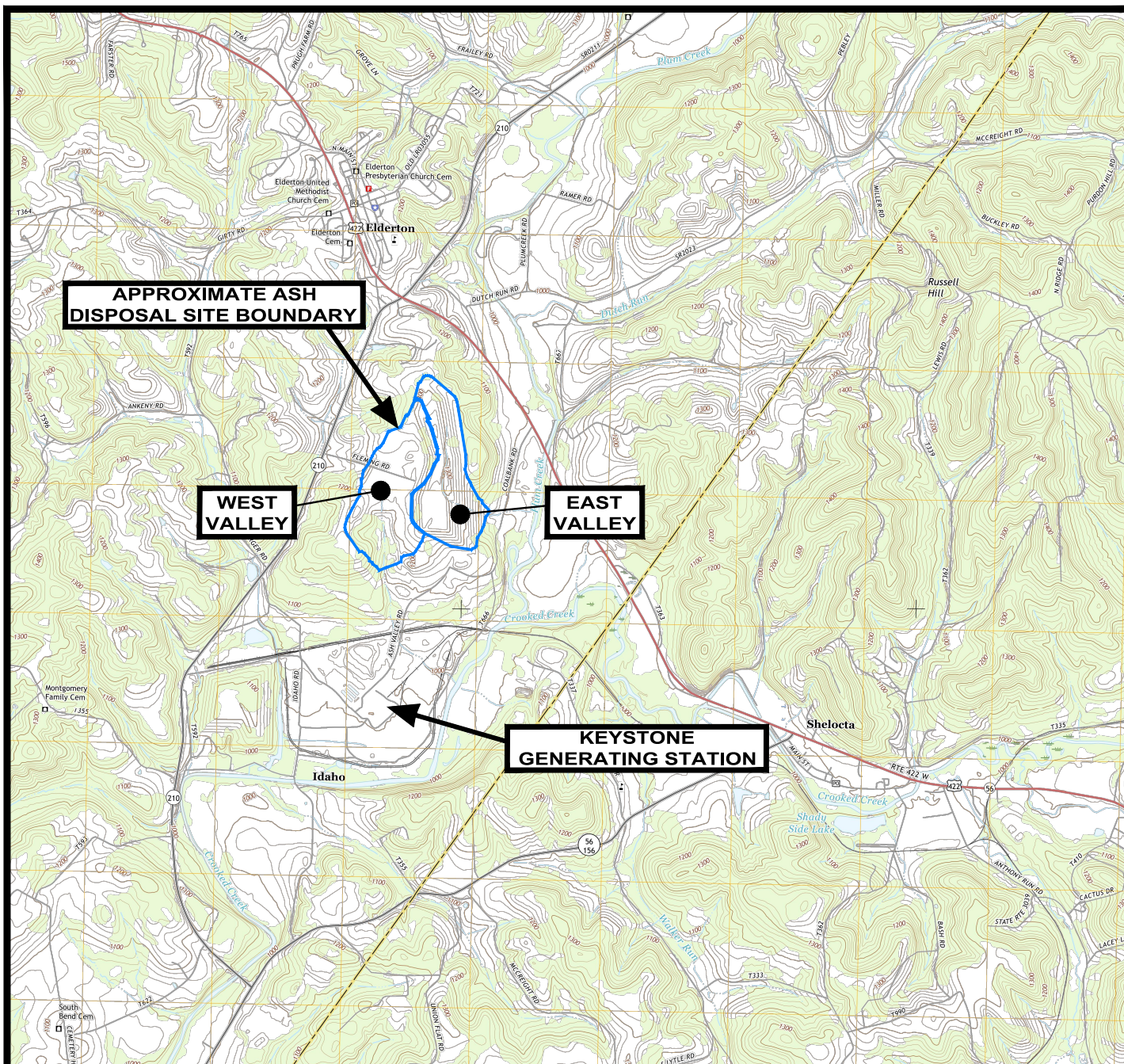
“Coal and Mineral Resource Study Conemaugh Generating Station Residual Waste Disposal Site, Indiana County Pennsylvania,” John T. Boyd Company, December 1994.

GAI Consultants, Inc. (1996), Pennsylvania Department of Environmental Protection Residual Waste Major Permit Modification, Keystone Station Disposal Site, Shelocta, Pennsylvania.

U.S. Environmental Protection Agency (2015), Hazardous Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, Federal Register Volume 80, No. 74 40 CFR Parts 257 and 261, April 17, 2015.





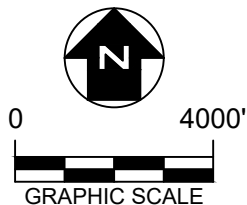


## LEGEND

— APPROXIMATE CCR UNIT BOUNDARY

## NOTES

1. TOPOGRAPHY OBTAINED FROM USGS 7.5-MINUTE SERIES, ELDERTON QUADRANGLE, PENNSYLVANIA, 2016.
2. ALL BOUNDARIES ARE APPROXIMATE



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**KEYSTONE  
GENERATING STATION**

**FIGURE 1  
SITE LOCATION PLAN**

APPROVED BY: RDS	PROJ. NO.: 1009174001	DATE: SEPT. 2018
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