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GEI Consultants

Little Broad Run Landfill

2024 Landfill Inspection

Mountaineer Plant, Letart, West Virginia

Submitted to:
American Electric Power Service Corporation
1 Riverside Plaza
Columbus, OH 43215

Submitted by:
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October 30, 2024
Project 2305686
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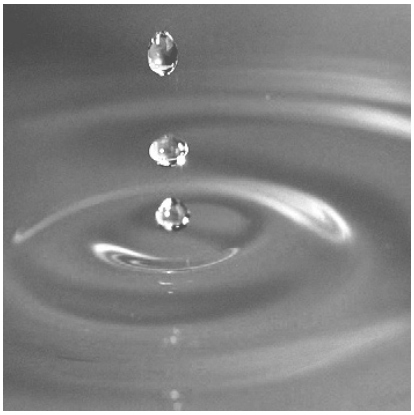


Pedro Amaya, PE
Senior Consultant

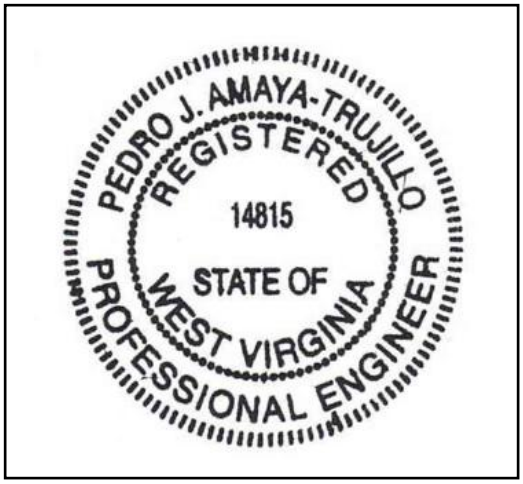
Jeff Piaskowski, PE
Senior Engineer

2024 Annual Inspection Report

Little Broad Run Landfill
Mountaineer Power Plant
AEP Document ID: GEVR-24-032

Signature

Pedro Amaya, PE
Senior Consultant
GEI Consultants Inc.



November 5, 2024
Date

SEAL

I certify, to the best of my knowledge, that the information provided in this report satisfies the requirements of 40 CFR 257.84(b).

Table of Contents

Figures

Appendices

JRP

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1. Introduction

GEI Consultants, Inc. was retained by AEP to implement the 2024 Inspection and Maintenance Program at AEP facilities. As part of the program, GEI's Pedro Amaya, P.E. performed the 2024 inspection of the Little Broad Run Landfill at the Mountaineer Power Generating Plant in general accordance with the requirements of 40 CFR 257.84. Mr. Charles Cunningham Jr. was the AEP facility contact. This report was prepared by Pedro Amaya, PE and Jeff Piaskowski, PE of GEI and serves as a summary of the inspection and an assessment of the general conditions of the Little Broad Run Landfill at the Mountaineer Power Generating Plant.

The inspection was performed on September 3, 2024, in general accordance with the Mining Safety and Health Administration (MSHA) Dam Inspection Guidelines. Weather conditions were sunny with mild temperatures between 70- and 80-degrees Fahrenheit. Approximately 1.0-inch of precipitation was recorded regionally in the 7 days prior to the inspection.

The Mountaineer Power Generating Plant is located in Letart, West Virginia as shown on Figure 1 – Site Location Map. The facility arrangement is provided on Figure 2 – Facility Plan. The Landfill and its accessory structures are shown on Figure 3 – Site Plan.

2. Description of Landfill

The Landfill is permitted for nine disposal areas (Area 1 through Area 9) and a vertical expansion that is designed over the existing landfill area of approximately 209 acres. Areas 1-7 of the landfill are filled to the permitted grades. Areas 8 and 9 are permitted but not constructed. The vertical expansion is currently divided into four development phases (Phase 1-4) and could be adjusted in acreages based on the operational needs. Figure 3 – Site Plan identifies the landfill, leachate collection ponds, and gypsum stacker pad.

3. Review of Available Information (257.84(b)(1)(i))

3.1 General Observations

A review of available information regarding the status and condition of the Little Broad Run Landfill, which include files available in the operating record, such as design, and construction information, previous 7-day inspection reports, and previous annual inspections reports. Based on the review of the data there were no new signs of actual or potential structural weakness or adverse conditions. There is an outstanding deficiency, and the evaluation of permanent remedial measures to address the open deficiency are ongoing and discussed in Section 6.

4. Inspection (257.84(b)(1)(ii))

4.1 Changes in Geometry Since Last Inspections (257.84(b)(2)(i))

No modifications have been made to the geometry of the Landfill since the previous annual inspection. The geometry of the landfill has remained essentially unchanged, except for the change in topography of the active disposal area.

4.2 Volume (257.84(b)(2)(ii))

The total volume of CCR waste disposed at the landfill as of August 2024 was estimated by AEP to be 25.98 million cubic yards.

4.3 Summary of Inspection Terms

This summary of the visual observations uses terms to describe the general appearance or condition of an observed item, activity, or structure. The meaning of these terms is as follows:

Good: A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.

Fair/Satisfactory: A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.

Poor: A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.

Minor: A reference to an observed item (e.g. erosion, seepage, vegetation, cracks, concrete surface etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.

Significant: A reference to an observed item (e.g. erosion, seepage, vegetation, cracks, concrete surface etc.) where the current maintenance program has neglected to improve the condition. Usually, conditions that have been identified in previous inspections, but have not been corrected.

Excessive: A reference to an observed item (e.g. erosion, seepage, vegetation, cracks, concrete surface etc.) where the current maintenance condition is below or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or area being observed or which may be a concern from a structure safety or stability point of view.

This document also uses the definition of a "deficiency" as referenced in the CCR rule section §257.84(b)(5) Inspection Requirements for CCR Landfills. This definition has been assembled using the CCR rule preamble as well as guidance from MSHA, "Qualifications for Impoundment Inspection" CI-31, 2004. These guidance documents further elaborate on the definition of deficiency. Items not defined by deficiency are considered maintenance or items to be monitored.

A "deficiency" is some evidence that the CCR Unit has developed a problem that could impact its structural integrity. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage

   Uncontrolled seepage is an uncontrolled release from the unit.

2. Displacement of the Embankment

   Displacement of the embankment is large scale movement of part of the pond embankment. Common signs of displacement are cracks, scarps, bulges, depressions, sinkholes, and slides.

3. Blockage of Control Features

   Blockage of Control Features is the restriction of flow at spillways, decant or pipe spillways, or drains.

4. Erosion

   Erosion is the gradual movement of surface material by water, wind, or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

4.4 Visual Inspection (257.84(b)(1)(ii))

A visual inspection of the landfill was conducted to identify signs of distress or malfunction of the landfill and accessory structures. Specific items inspected included structural elements of the landfill perimeter berms, temporary and final covers, drainage features, open cells, and accessory structures such as chimney drains, etc.

Overall, the facility is in satisfactory condition. The landfill is functioning as intended with no new signs of potential structural weakness or conditions which are disrupting to the safe operation of the landfill. A summary of the observations are provided below. Inspection photos are included in Appendix A and their locations are provided on Figures 3 – Site Plan.

1. The top deck drainage is in good condition. The vegetation is healthy, maintained to 12-inches or less, and no erosion was observed as shown in Photograph No. 1, No. 3, No. 4, No. 5, No. 6, No. 8.

2. Areas where erosion was previously observed have been repaired/revegetated or lined with riprap as shown in Photograph No. 2 and Photograph No. 7, respectively.

3. The landfill active area is in good condition. CCR is being placed, clay perimeter berms are being constructed, and chimney drains are being installed in accordance with the fill progression plan as shown in Photograph No. 9 and Photograph No. 10.

4. Landfill drainage features are in good condition. No blockages were observed, and vegetation was maintained to 12-inches or less in areas of channelized flow as shown in Photograph No. 11.

5. The landfill sediment ponds are in good condition. The inlet and outlet structures were free of obstructions and no erosion was observed. The turbidity curtains seemed to be installed per manufacturer recommendations and were functioning as designed. The ponds were operating with sufficient freeboard and do not need to be cleaned out as shown in Photograph No. 12, No. 13, No. 15, and No. 16.

6. The leachate ponds are in satisfactory condition. The leachate collection vault was operating as designed as shown in Photograph No. 14. The leachate drainage structures are in good condition and free of obstructions as shown in Photograph No. 17 and No. 18. Some minor vegetation was observed in the concrete contraction joints. Please consider removing the vegetation in the contraction joints and sealing the joints with Sonolastic NP1 or equivalent polyurethane sealant.

4.5 Changes that Effect Stability or Operation (257.84)(b)(2)(iv))

Based on interviews with plant personnel and field observations there were no changes to the landfill since the last annual inspection that would affect the stability of the landfill.

5. Summary of Findings

5.1 General Observations

The following general observations were identified during the visual inspection:

1. In general, the landfill is functioning as its design intended. The fill progression plan is being followed that maintains a sloped CCR surface that drains towards the bottom ash chimney drains that conveys the contact water to the leachate collection system.

2. The plant is performing regular maintenance and inspections. Vegetation is well established on the landfill cover.

3. Site drainage and stormwater controls are generally functioning per their designs with no blockages observed on any drainage structures.

5.2 Maintenance Considerations

The maintenance items are provided for consideration:

1. Continue routine mowing of the temporary cover.

2. Address issues like minor animal burrows and minor erosion rills before they become significant.

3. Continue to check site drainage features such as culverts, ditches, and outfall structures for debris/blockages to allow the site stormwater to flow as it was designed.

4. Seal concrete joints with Sonolastic NP1 or equivalent polyurethane sealant.

6. Deficiencies

An outstanding deficiency exists pertaining to leachate seepage and buildup in Area 3 of the existing landfill. The deficiency was identified as part of regular monitoring and inspections on July 9, 2020.

An interim seepage control plan for Area 3 was developed that consisted of installing several shallow toe drains and sump structures to intercept the seepage before it could daylight through the toe areas of the cover soils. The sump structures pump the collected seepage to a storage tank that is then emptied back into the landfill leachate collection system. A study into the thickness and permeability of the final soil cap in Area 3 was completed in March, 2022.

The remediation plan for the seepage build-up in Area 3 that consisted of ten dewatering wells that discharge into a storage tank. The system was installed in July 2022 and began dewatering on August 4, 2022. Weekly piezometer readings continue to be collected to monitor the effectiveness of the system.

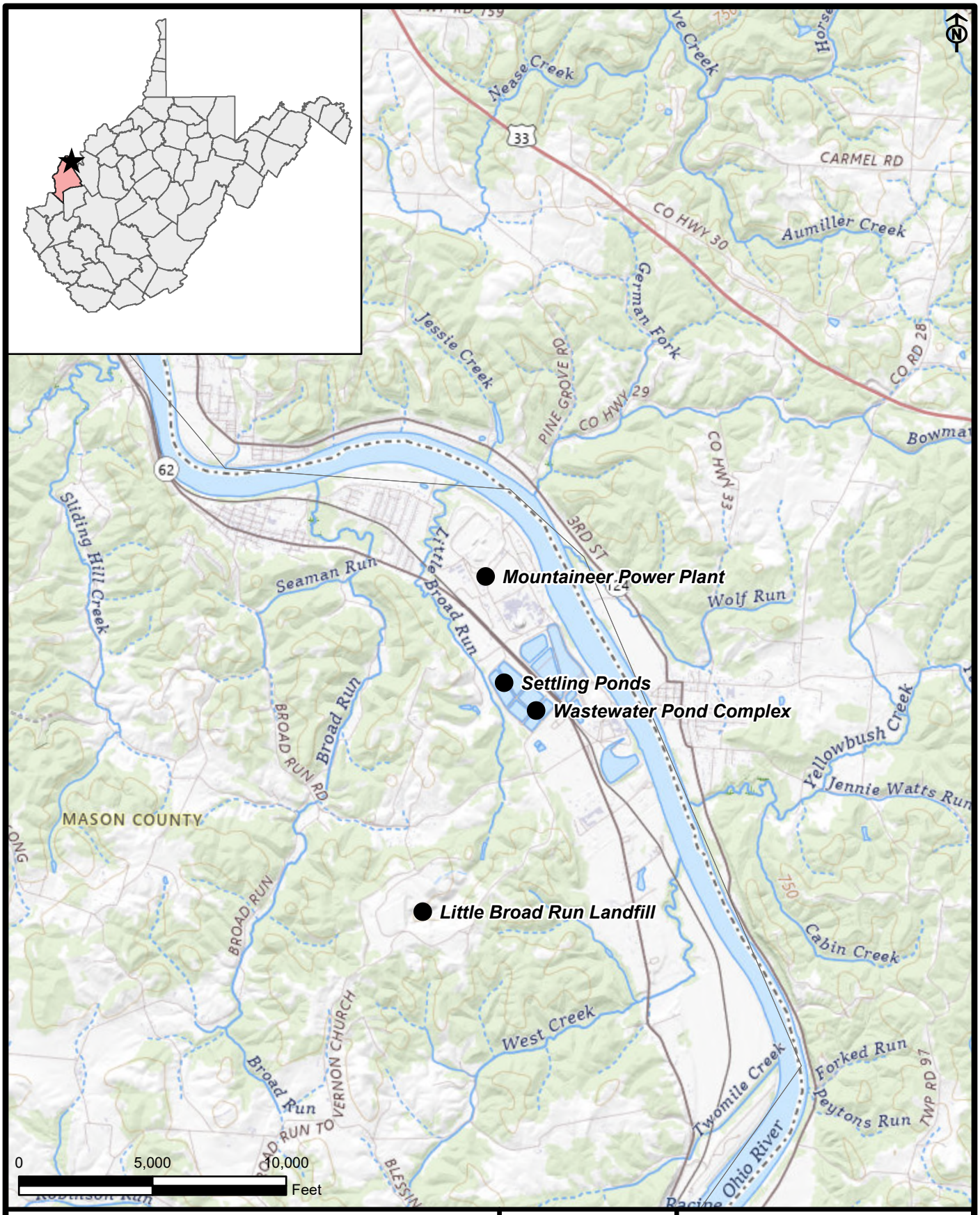
Limited progress has been made in lowering the leachate levels. A geophysical investigation was undertaken in May 2023 with the intent of identifying the water source and identifying any issues with the leachate collection system. Those results are being evaluated to identify the best technical approach to resolve the deficiency. Based on those results an additional geotechnical and hydrogeologic investigation have been conducted in 4th quarter 2023 and 3rd quarter 2024 to evaluate repair/replacement of the existing combined underdrain/leachate line and controlling groundwater sources.

During the 2024 annual inspection, there were no new signs of structural weakness or disruptive conditions that were observed at the time of the inspection that would require additional investigation or remedial action. A deficiency is defined as either:

- uncontrolled seepage
- displacement of the embankment
- blockage of control features
- erosion, more than minor maintenance

If any of these conditions occur or if you have any questions with regard to this report, please contact Brian Palmer at 614-716-3382 bgpalmer@aep.com or Bryan Brunton at 614-716-3090 bwbrunton@aep.com.

Figure 1 – Site Location Map



2024 Annual Little Broad Run Landfill Inspection Report
Mountaineer Power Plant
New Haven, West Virginia

American Electric Power Service Corporation
Columbus, OH 43215

GEI Consultants

Project 2305686

SITE LOCATION DIAGRAM

October 2024

Fig. 1

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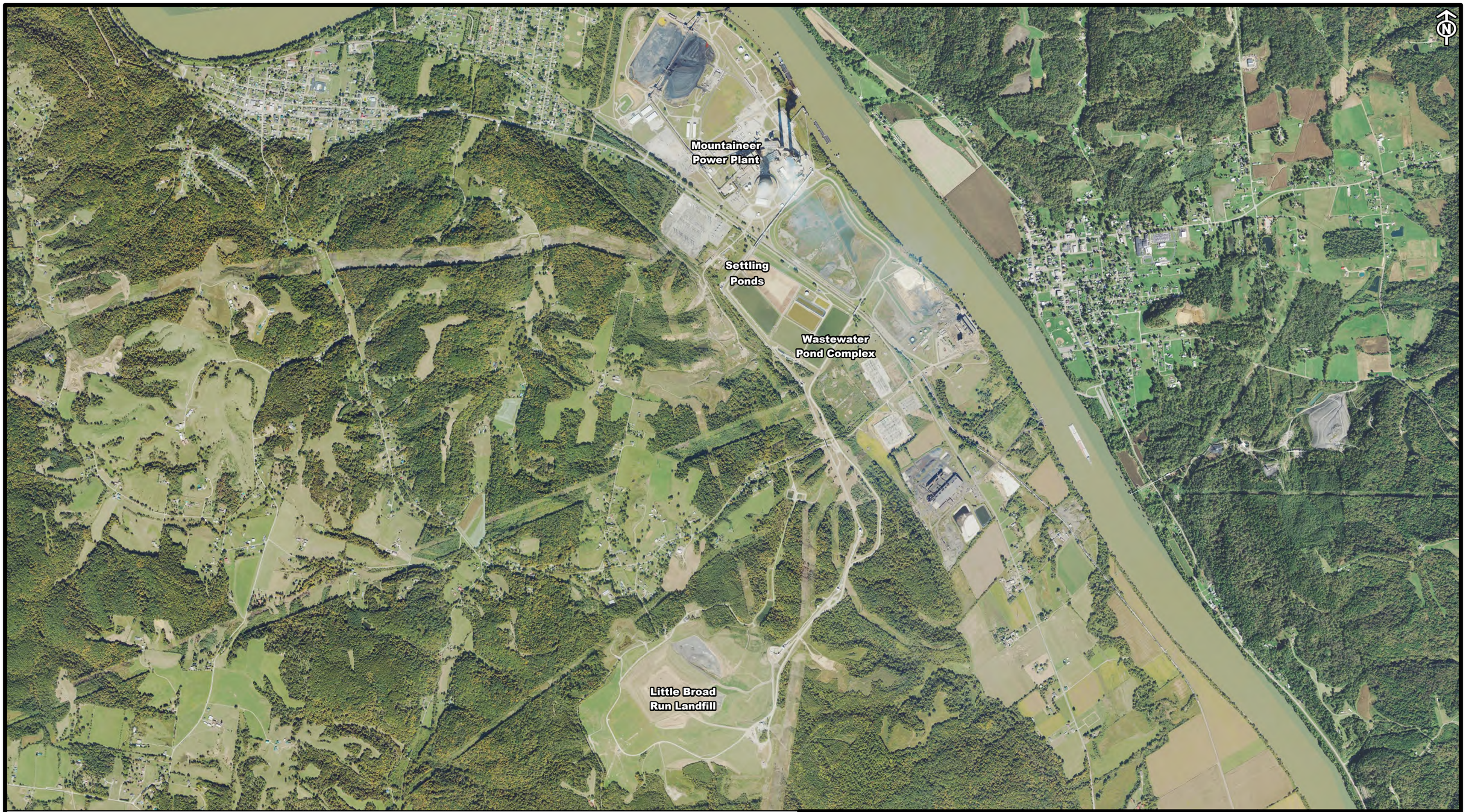
Figure 2 – Facility Plan



NOTES:

1. Aerial image obtained from USDA NAIP. Image captured spring of 2021.

2. Site conditions may change over time, accuracy is not guaranteed.

0 2,000 4,000 Feet

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GEI Consultants

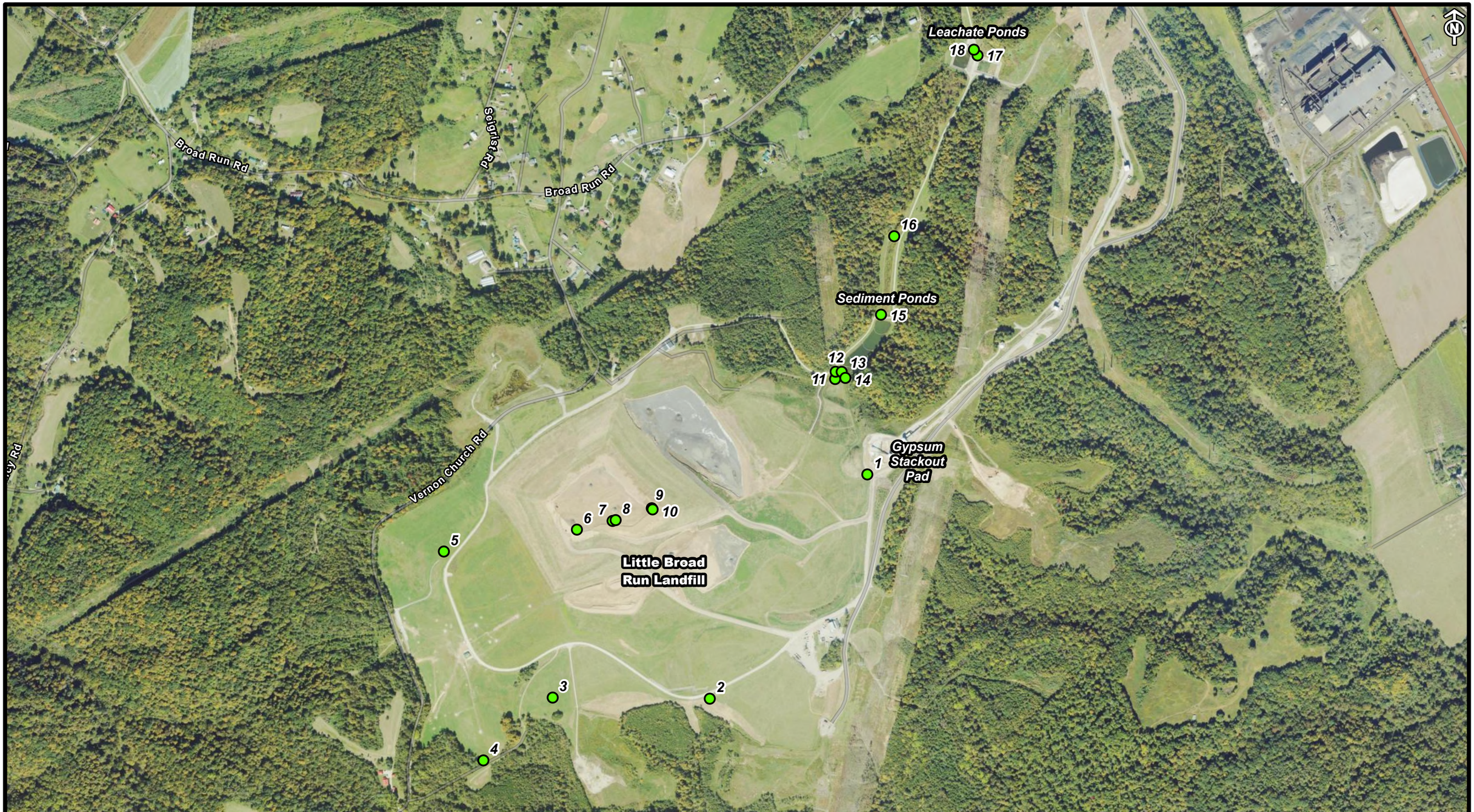
FACILITY PLAN

Project 2305686

October 2024 Fig. 2

Path: B:\Working\AEP\2305686 2024 Dam & Landfill Field Insps\05_GIS\ArcGIS_Pro\2305686 2024 Dam & Landfill Field Insps.aprx

Figure 3 – Site Plan



LEGEND:

- General Observation

NOTES:

1. Aerial image obtained from USDA NAIP. Image captured spring of 2021.
2. Points shown represent site conditions during time of inspection. Conditions may change overtime, accuracy is not guaranteed. Map should not be used for measurement.

0 800 1,600 Feet

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SITE PLAN

September 2024 Fig. 3

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Appendix A - Photolog

Photographic Log

Project: Mountaineer Power Plant, Little Broad Run Landfill Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 1	DATE: September 3, 2024 7:50 AM	LATITUDE: 38.94928035	LONGITUDE: -81.94172092
DIRECTION: 207°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Top deck Drainage. Ground Cover, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 2	DATE: September 3, 2024 7:59 AM	LATITUDE: 38.94415032	LONGITUDE: -81.94691341
DIRECTION: 12°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Downstream Slope of Stability Berm. Stormwater collection recently repaired and regraded to repair erosion noted in previous reports			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Mountaineer Power Plant, Little Broad Run Landfill Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 3	DATE: September 3, 2024 8:08 AM	LATITUDE: 38.94438807	LONGITUDE: -81.95170257
DIRECTION: 38°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Final Cover. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 4	DATE: September 3, 2024 8:15 AM	LATITUDE: 38.94298466	LONGITUDE: -81.95392475
DIRECTION: 226°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Final Cover in Area 3. Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Mountaineer Power Plant, Little Broad Run Landfill Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 5	DATE: September 3, 2024 8:46 AM	LATITUDE: 38.94801407	LONGITUDE: -81.95477166
DIRECTION: 314°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Final Cover. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 6	DATE: September 3, 2024 8:54 AM	LATITUDE: 38.94835653	LONGITUDE: -81.95067474
DIRECTION: 134°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Final Cover and Cap. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Mountaineer Power Plant, Little Broad Run Landfill Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 7	DATE: September 3, 2024 8:57 AM	LATITUDE: 38.94851625	LONGITUDE: -81.94957212
DIRECTION: 125°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Downstream Slope of Final Cover. Erosion recently addressed. Note Stone Filled drainage channel			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 8	DATE: September 3, 2024 9:00 AM	LATITUDE: 38.94853115	LONGITUDE: -81.94947699
DIRECTION: 287°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Top deck. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Mountaineer Power Plant, Little Broad Run Landfill Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 9	DATE: September 3, 2024 9:03 AM	LATITUDE: 38.94876544	LONGITUDE: -81.94835445
DIRECTION: 317°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Active Area. General Photo, Typical Conditions. Note Perimeter Berms and Chimney Drain Bottom Ash Piles.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 10	DATE: September 3, 2024 9:07 AM	LATITUDE: 38.94873656	LONGITUDE: -81.94833085
DIRECTION: 53°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Final Cover. General Photo of clay stockpile, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Mountaineer Power Plant, Little Broad Run Landfill Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 11	DATE: September 3, 2024 9:29 AM	LATITUDE: 38.95159629	LONGITUDE: -81.94253812
DIRECTION: 322°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Riprap Drainage Feature. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 12	DATE: September 3, 2024 9:33 AM	LATITUDE: 38.95177044	LONGITUDE: -81.9425098
DIRECTION: 349°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Sediment Ponds. Water level approximately 4 feet below landfill underdrain discharge pipe invert and stormwater discharge pipes			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Mountaineer Power Plant, Little Broad Run Landfill Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 13	DATE: September 3, 2024 9:37 AM	LATITUDE: 38.95175951	LONGITUDE: -81.94232611
DIRECTION: 147°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Little Broad Run Landfill. Sediment Ponds. Groundwater under drains. Approximate Drain flow (left) 20 oz in 4 seconds; (right) 20 oz in 23 seconds.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 14	DATE: September 3, 2024 9:44 AM	LATITUDE: 38.95160984	LONGITUDE: -81.9422238
DIRECTION: 337°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Leachate Collection Vault. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Mountaineer Power Plant, Little Broad Run Landfill Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 15	DATE: September 3, 2024 9:49 AM	LATITUDE: 38.95306787	LONGITUDE: -81.94102703
DIRECTION: 312°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Landfill Sediment Ponds. Note: Riprap Stabilized Area of Former Slip. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 16	DATE: September 3, 2024 9:52 AM	LATITUDE: 38.95491906	LONGITUDE: -81.94048973
DIRECTION: 232°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Landfill Sediment Ponds. Outfall Structure and Downstream Slope. Riprap Ground Cover. General Photo, Typical Conditions. Water level approximately 5-feet below overflow pipe.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Mountaineer Power Plant, Little Broad Run Landfill Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 17	DATE: September 3, 2024 9:59 AM	LATITUDE: 38.95911334	LONGITUDE: -81.93763447
DIRECTION: 5°	SITE LOCATION: LETART, WEST VIRGINIA		

DESCRIPTION:

Leachate Ponds. Consider addressing any vegetation in the concrete joints during routine maintenance activities. Concrete joints could also be sealed with Sonolastic NP1 or equivalent Polyurethane Sealant.

PHOTO BY:

GEI CONSULTANTS, INC.

PHOTOGRAPH NO: 18	DATE: September 3, 2024 10:02 AM	LATITUDE: 38.95925553	LONGITUDE: -81.93773604
DIRECTION: 140°	SITE LOCATION: LETART, WEST VIRGINIA		

DESCRIPTION:

Leachate Ponds. Leachate Collection System area, Stilling Basin. Concrete, Typical Conditions.

PHOTO BY:

GEI CONSULTANTS, INC.