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GEI Consultants

Settling Ponds

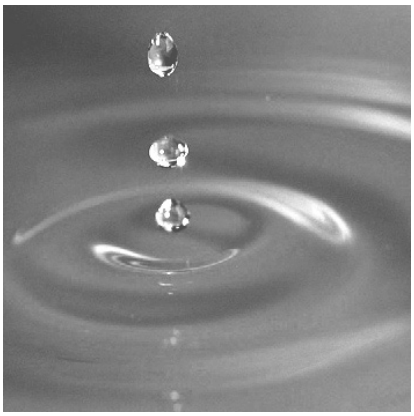
2024 Dam and Dike Inspection

Mountaineer Plant, Letart, West Virginia

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

Submitted by:
GEI Consultants, Inc.
3159 Voyager Drive
Green Bay, Wisconsin 54311
920.455.8200

October 30, 2024
Project 2305686
AEP Document ID: GEVR-24-031



Pedro Amaya, PE
Senior Consultant

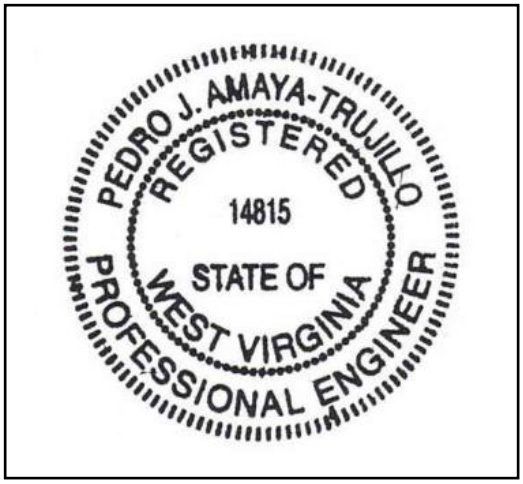
Jeff Piaskowski, PE
Senior Engineer

2024 Annual Inspection Report

Settling Ponds
Mountaineer Power Plant
AEP Document ID: GEVR-24-031

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 257.83(b).

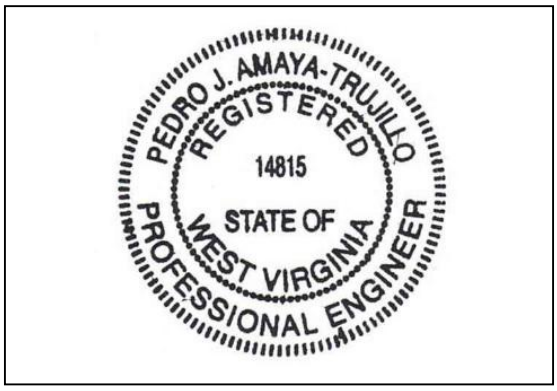
OWNER'S ENGINEER
INSPECTION VERIFICATION STATEMENT

For Compliance with Dam Safety Rule 47CSR34-15.4.c

I hereby verify that I *or an experienced engineer under my supervision,* conducted a visual inspection of the Mountaineer Bottom Ash Complex Dam (ID # 05307) and its appurtenances on September 3, 2024. The attached signed and sealed inspection report documents: 1) the current conditions as observed; 2) any maintenance items necessary to prolong safe functioning of the dam; 3) any conditions observed during the inspection which indicate that the dam has a serious problem* and 4) any conditions that will not allow proper operation of the dam during normal or maximum reservoir water level conditions.

Signature

Pedro Amaya, PE
Printed Name and Title



November 5, 2024
Date

*as defined in Section 2.56 of the Dam Safety Rule

Submit to:
DEP Dam Safety Section
601 57th Street SE
Charleston, WV 25304
DEPDamSafetyProgram@wv.gov

Table of Contents

JRP
B:\Working\AEP\2305686 2024 Dam & Landfill Field Insps\07_DRAFT INSPECTION REPORTS\01Mountaineer\CCR Settling Ponds\DRAFT_2024 Mountaineer CCR Settling Ponds.docx

1. Introduction

GEI Consultants, Inc. was retained by AEP to implement the 2024 Dam and Dike Inspection and Maintenance Program at AEP facilities. As part of the program, GEI's Pedro Amaya, P.E. performed the 2024 inspection of the Settling Ponds at the Mountaineer Power Generating Plant in general accordance with the requirements of 40 CFR 257.83. 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 Settling Ponds 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 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 Settling Ponds and accessory structures are shown on Figure 3 – Site Plan.

2. Description of Settling Ponds

The Bottom Ash Complex (CCR Unit) has been repurposed into a wastewater complex as CCR Storage has ceased and been removed from the complex. The former East Bottom Ash Pond has been repurposed as a lined Pyrite Pond and East Settling Pond. The West Bottom Ash Pond has been repurposed as a lined West Settling Pond. Closure of the former Bottom Ash Ponds is contingent on the unit's groundwater monitoring results.

The pond embankments are less than 50-feet-high and have 3:1 (H:V) upstream and downstream side slopes. The East and West Settling Ponds are lined with a double geomembrane and are designed to operate with normal pool elevation of 612 feet. The Mountaineer Power Generating Plant converted to a dry handling system for bottom ash in 2022. As a result, no bottom ash is sluiced to the Settling Ponds.

3. Review of Available Information (257.83(b)(1)(i))

In addition to the visual inspection, a review of available information regarding the status and condition of the East and West Settling Ponds was completed. This review included files available in the operating record, such as design and construction information, previous periodic structural stability assessments, previous 7-day inspection reports, previous 30-day instrumentation data, and previous annual inspections reports. Based on the findings of the current inspection and review of the available data, it is concluded, there were no signs of actual or potential structural weakness or adverse conditions, and that the surface impoundment is functioning as its design intended.

4. Inspection (257.83(b)(1)(ii))

4.1 Changes in Geometry Since Last Inspections (257.83(b)(2)(i))

CCR removal and repurposing was completed in 2023 prior to the annual inspection. No changes in geometry have been made since the 2023 annual inspection.

4.2 Impoundment Characteristics (257.83(b)(2)(iii, iv, v))

Table 1 is a summary of the minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection; the approximate volume of the impounded water and CCR at the time of the inspection.

Table 1: Settling Pond Annual Summary

Parameter	West Settling Pond	East Settling Pond
	Depth (Elevation)	
Approximate **Minimum** depth of impounded water since last annual inspection	NA	NA
Approximate **Maximum** depth of impounded water since last annual inspection	NA	NA
Approximate **Minimum** depth of CCR since last annual inspection	NA	NA
Approximate **Maximum** depth of CCR since last annual inspection	None	None
Approximate **Present** depth of CCR at the time of the inspection	NA	NA
Approximate **Present** depth of impounded water at the time of the inspection	NA	NA
Storage Capacity of impounding structure at the time of the inspection	NA	NA
Approximate volume of impounded water at the time of the inspection	NA	NA
Approximate volume of CCR at the time of the inspection	None	None

Note: All CCR has been removed and the ponds have been repurposed as Settling Ponds for miscellaneous wastewater treatment.

4.3 Summary of Inspection Terms

The summary of the visual observations presented herein uses terms to describe the general appearance or condition of an observed item, activity or structure. Their meaning is understood 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 e 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 §257.83(b)(5) Inspection Requirements for CCR Surface Impoundments. 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 identified as a deficiency are considered routine maintenance activities or items to be monitored.

In addition, a "deficiency" is some evidence that a dam has developed a problem that could impact the structural integrity of the dam. There are four general categories of deficiencies. These four categories are described below:

- Uncontrolled Seepage
    - Uncontrolled seepage is seepage that is not behaving as the design engineer has intended. An example of uncontrolled seepage is seepage that comes through or around the embankment and is not picked up and safely carried off by a drain. Seepage that is collected by a drain can still be uncontrolled if it is not safely collected and transported, such as seepage that is not clear. Seepage that is unable to be measured and/or observe it is considered uncontrolled seepage.

      [Wet or soft areas are not considered as uncontrolled seepage but can lead to this type of deficiency. These areas should be monitored frequently.]

- Displacement:
    - Displacement of the embankment is large scale movement of part of the dam/dike. Common signs of displacement are cracks, scarps, bulges, depressions, sinkholes, and slides.

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

- 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 (257.83(b)(i))

A visual inspection of the East and West Settling Ponds was conducted to identify signs of distress or malfunction of the impoundment and accessory structures. Specific items inspected included structural elements of the dam such as upstream and downstream slopes, crest, and toe; as well as accessory drainage features.

Overall, the surface impoundment is in good condition. The impoundment is functioning as intended with no signs of potential structural weakness or conditions which are disrupting to the safe operation of the impoundment. Inspection photos are included in Appendix A. The

locations of the inspection photos are included on Figure 3 – Site Plan and Figure 4 – Items to be Monitored.

1. The East Settling Pond upstream slope was in good condition. The exposed Fabriform liner showed no signs of wear or distress as shown in Photograph No. 1.

2. The West Settling Pond upstream slope was in good condition. The exposed geomembrane liner showed no signs of wear or distress as shown in Photograph No. 3.

3. The West Settling Pond downstream slope was in good condition. The vegetation was healthy and maintained to 12-inches or less as shown in Photograph No. 4. No erosion or seepage was observed.

4. The East Settling Pond downstream slope was in satisfactory condition. The vegetation was healthy and maintained to 12-inches or less as shown in Photograph No. 5. A wet area was observed near the toe of the slope and should be monitored to determine if it is related to seepage or if it is due to stormwater drainage as shown in Photograph No. 2.

4.5 Assessment of Recent Instrumentation Data (257.83(b)(2)(ii))

Three standpipe piezometers exist around the Wastewater Pond Complex (includes the East and West Settling Ponds) as shown on Figure 3. Regular readings are recorded for each piezometer at a minimum 30-day interval. The piezometer readings exhibited minor fluctuations month to month during 2024, although it should be noted that PZ-09-03 was 7.1 feet lower than elevations recorded in 2023. PZ-09-03 was redeveloped in the fall of 2023 and generally has lower static groundwater elevations compared to its historical monitoring results. A graph of the 2024 piezometer readings are provided in Appendix B – Instrumentation Data.

Table 2: Maximum Annual Piezometer Elevation

Piezometer	Max Groundwater Elevation 2023	Max Groundwater Elevation 2024	Difference (feet)
PZ-09-03	580.0	572.9	7.1
PZ-09-04	572.2	572.4	0.2
PZ-09-05	561.8	561.8	0.0

Note: Elevations reported in feet mean sea level.

4.6 Changes that Effect Stability or Operation (257.83)(b)(2)(vii))

There have been no changes that effect the stability or operation of the East and West Settling Ponds since the 2023 annual inspection.

5. Summary of Findings

5.1 General Observations

The facility is generally in good condition. The Settling Ponds appear to be functioning as intended with no signs of structural weakness. The constructed dikes appear in good condition. The vegetation was maintained to 12-inches or less and the drainage features were clear of obstructions and appear to be functioning as designed.

5.2 Items to Monitor

- Item No. 2 – Monitor the downstream slope of the East Settling Pond. The toe of the slope was observed to be wet. If this is result of stormwater ponding this area, considering grading the area to promote positive drainage.
- Static groundwater elevations and pond pool elevations should continue to be graphed together.
    - Static water levels should continue to be measured on its current frequency for piezometers PZ-09-03, PZ-09-04, PZ-09-05.
    - The pond pool stages should be recorded the on a periodic basis with the piezometers.
- Monitor the dikes for movement, settlement, or changes in conditions.
- Monitor upstream and downstream embankment side slopes for animal burrows and seepage.

5.3 Maintenance Items

The following maintenance items were identified during the visual inspection:

- Continue to maintain the vegetation on the upstream and downstream side slopes to a height of 12-inches or less.
- Remove items that could block drainage features.

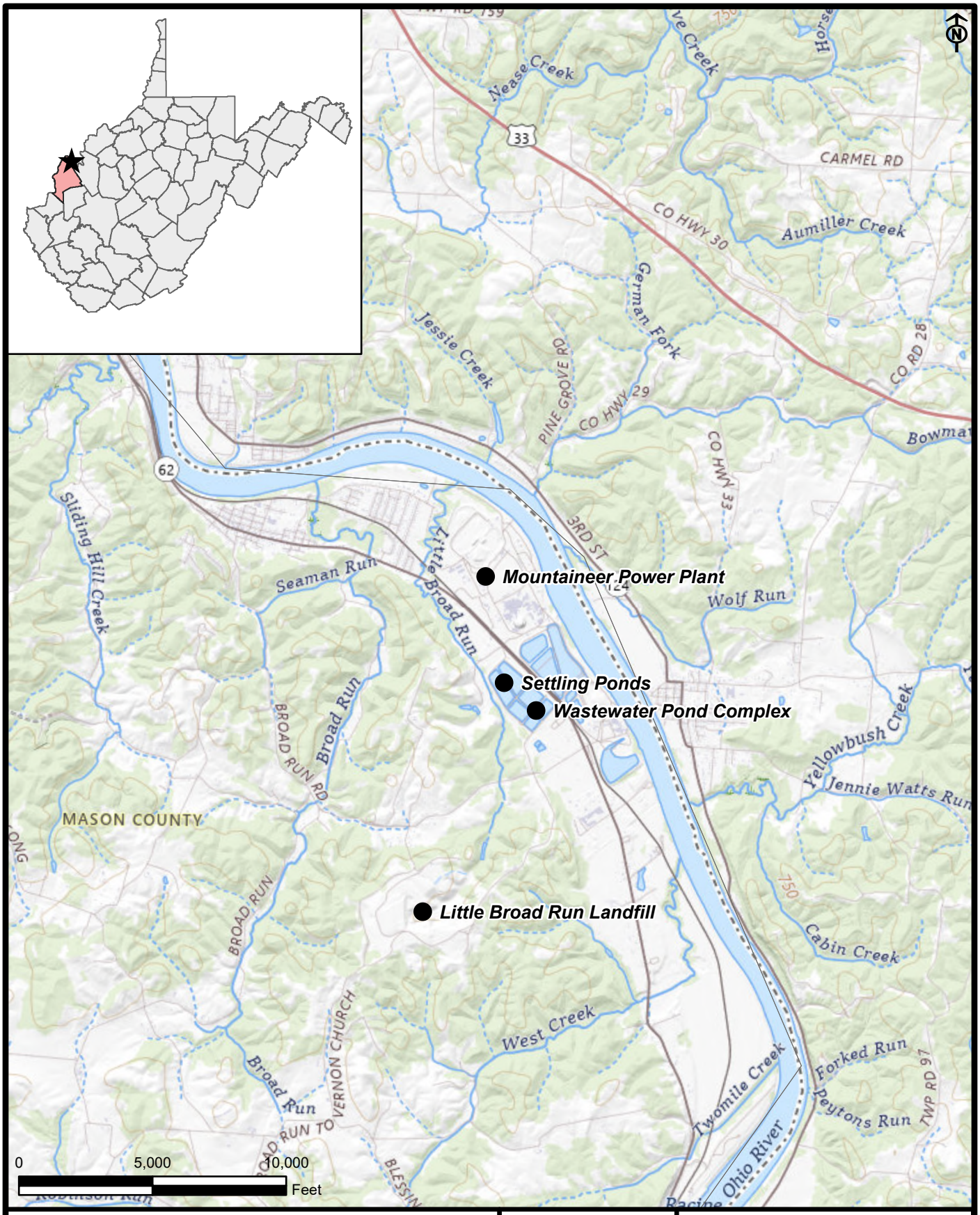
6. Deficiencies

There were no signs of structural weakness or disruptive conditions that were observed at the time of the inspection that would require additional investigation or remedial action. There were no deficiencies noted during this inspection or during any of the periodic inspections. 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 Settling Ponds Inspection Report
Mountaineer Power Plant
New Haven, West Virginia

American Electric Power Service Corporation
Columbus, OH 43215

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SITE LOCATION DIAGRAM

Project 2305686

October 2024

Fig. 1

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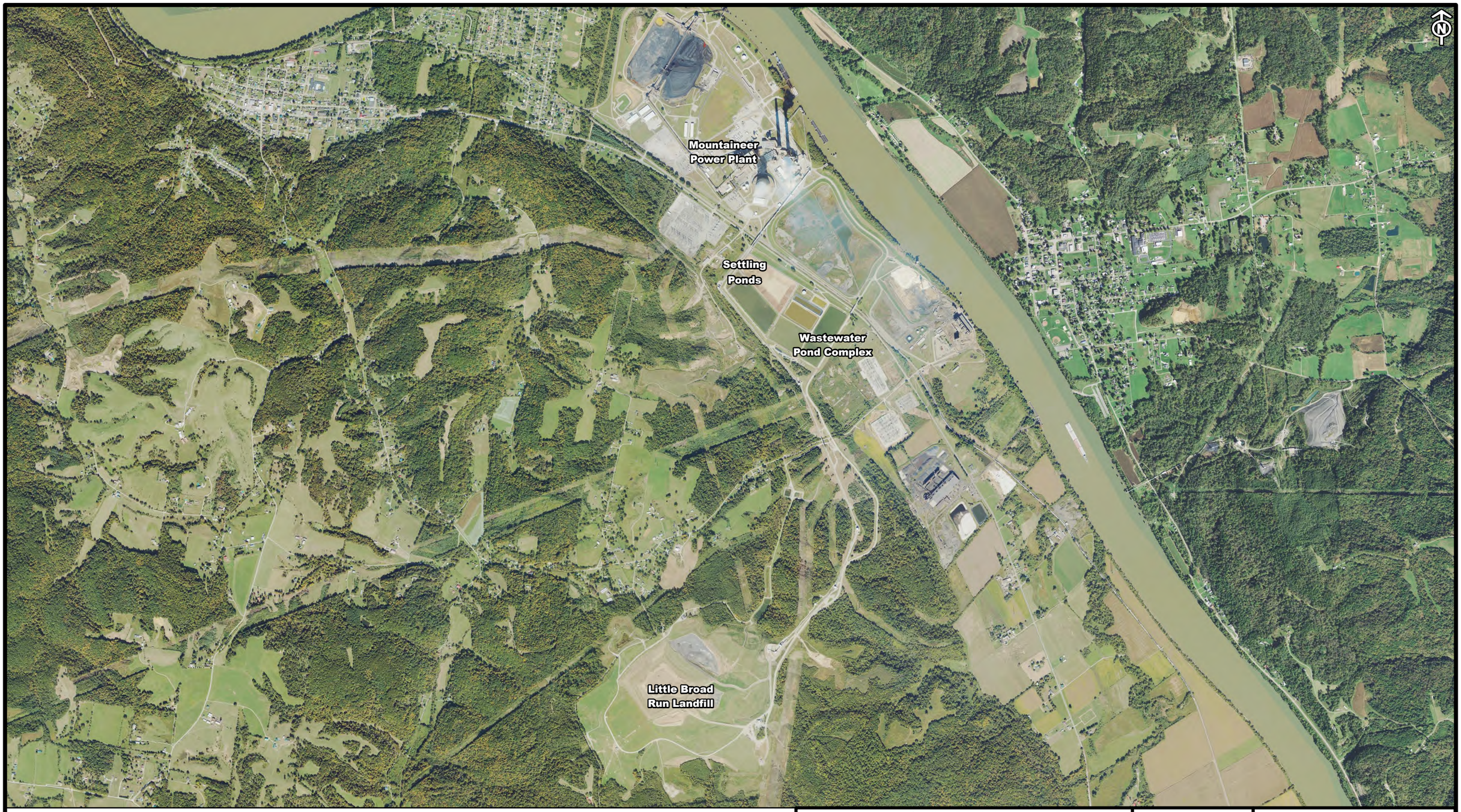
Figure 2 – Facility Plan



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

2024 Annual Settling Ponds Inspection Report
Mountaineer Power Plant
New Haven, West Virginia

American Electric Power Service Corporation
Columbus, OH 43215

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FACILITY PLAN

Project 2305686 | October 2024 | Fig. 2

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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.

0 240 480 Feet

2024 Annual Settling Ponds Inspection Report
Mountaineer Power Plant
New Haven, West Virginia

American Electric Power Service Corporation
Columbus, OH 43215

GEI Consultants

SITE PLAN

Project 2305686 | October 2024 | Fig. 3

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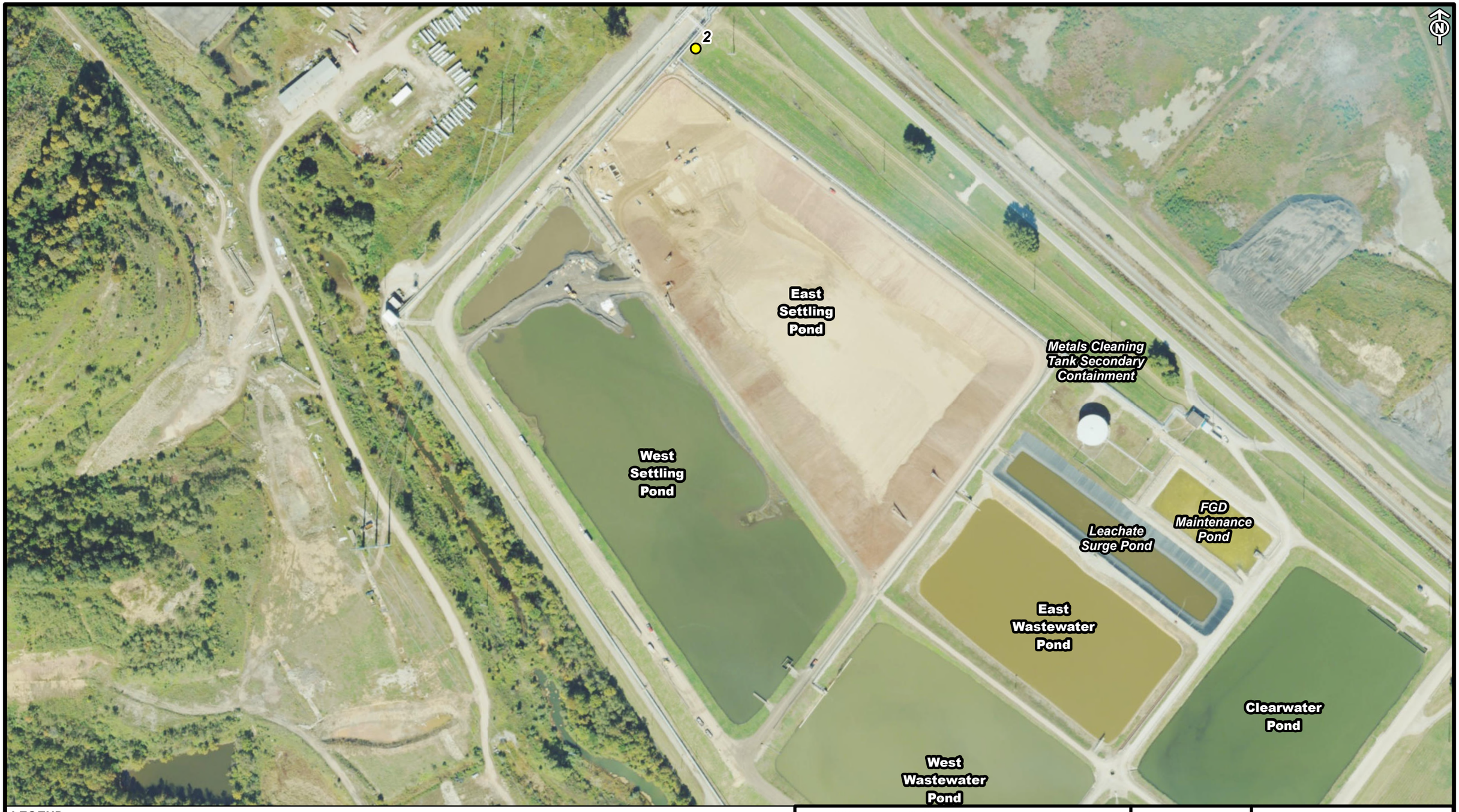
Figure 4 – Items to be Monitored



LEGEND:

- Monitor

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.

0 240 480 Feet

2024 Annual Settling Ponds Inspection Report
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New Haven, West Virginia

American Electric Power Service Corporation
Columbus, OH 43215

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ITEMS TO BE MONITORED

Project 2305686 | October 2024 | Fig. 4

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Appendix A - Photolog

Photographic Log

Project: Mountaineer Power Plant, CCR Settling Ponds Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 1	DATE: September 3, 2024 10:12 AM	LATITUDE: 38.97307164	LONGITUDE: -81.93882077
DIRECTION: 8°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: Pyrite Pond. Upstream Slope. General Photo, Typical Conditions. Note Pyrite Forebay area with Fabriform over Geomembrane Liner.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 2	DATE: September 3, 2024 10:18 AM	LATITUDE: 38.97370562	LONGITUDE: -81.93792839
DIRECTION: 30°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: East Settling Pond. East area, Downstream Slope of Dam. Note Wet Area along Toe, Monitor Conditions, address as necessary.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Mountaineer Power Plant, CCR Settling Ponds Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 3	DATE: September 3, 2024 11:03 AM	LATITUDE: 38.9685064	LONGITUDE: -81.93783231
DIRECTION: 298°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: West Settling Pond, Upstream Slope. General Photo, note Synthetic Liner.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 4	DATE: September 3, 2024 11:05 AM	LATITUDE: 38.9685417	LONGITUDE: -81.9380304
DIRECTION: 268°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: West Settling Pond. West area, Downstream Slope of Dam. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Mountaineer Power Plant, CCR Settling Ponds Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 5	DATE: September 3, 2024 11:14 AM	LATITUDE: 38.97202902	LONGITUDE: -81.94037675
DIRECTION: 322°	SITE LOCATION: LETART, WEST VIRGINIA		
DESCRIPTION: East Settling Pond. North area, Downstream Slope of Dam. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

Appendix B - Instrumentation

Mountaineer - 30 Day
Piezometer Readings
Wastewater Pond Complex
Settling Ponds