



### Amos FGD Landfill 2024 Annual Landfill Inspection Report

John E. Amos Plant, Putnum County, West Virginia

#### Submitted to:

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

#### Submitted by:

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October 16, 2024 Project 2305686 AEP Document ID: GEVR-24-022



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**2024 Annual Inspection Report** 



FGD Landfill Amos Power Plant AEP Document ID: GEVR-24-022

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Signature

Pedro Amaya, PE Senior Consultant GEI Consultants, Inc.

October 23, 2024

Date



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

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# 1. Introduction

GEI Consultants, Inc. was retained by AEP to implement the 2024 Annual Inspection and Maintenance Program at AEP facilities. As part of the program, GEI's Pedro Amaya, P.E. performed the 2024 inspection of the FGD Landfill at the Amos Power Generating Plant in general accordance with the requirements of 40 CFR 257.84. Mr. Derrick Brumfield and Mr. Jack Smith were the AEP facility contacts. 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 FGD Landfill at the Amos Power Generating Plant.

The inspection was performed on July 22, 2024 with cloudy skies and mild temperatures between 70 and 80 degrees Fahrenheit. Approximately 0.5-inches of precipitation was recorded in Winfield, West Virginia in the 7 days prior to the inspection.

The Amos Power Generating Plant is located near Winfield, West Virginia as shown on Figure 1 – Site Location Map. The facility arrangement is provided on Figure 2 – Facility Plan. The Bottom Ash Pond Complex and their appurtenances are shown on Figure 3 – Site Plan.

# 2. Description of Landfill

The FGD landfill was re-permitted on September 7, 2017 by the West Virginia Department of Environmental Protection (Permit No. WV0116254) that reduces the number of sequences and footprint. The landfill now consists of nine sequences that will encompass 191.9 acres with an airspace capacity of approximately 36.8 million cubic yards.

The landfill permit revision include design changes for the landfill liner and the landfill final cover that is compliant with 40 CFR 257 Subpart D (CCR Rule).

Approximately 100 acres (Sequences 1 through 4) have been developed and contain CCR material. Sequences 1 through 3 drain to the South Valley leachate/sedimentation basin complex.

Sequence 4 completed construction in 2019 and was placed into service. Sequence 4 along with future sequences (5-9) drain to the North Valley leachate/sedimentation basin complex.

Approximately 16.3 acres within the South Valley had final cover cap installed in 2018 to 2019. An additional 9 acres of the South Valley slopes had final cover installed in 2022.

The landfill utilizes sediment collection ponds and two leachate holding basins at the mouth of each drainage area (North and South Areas). The sediment collection ponds are used to collect non CCR contact stormwater. The leachate holding basins collect and contain leachate and contact CCR stormwater.

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

A review of the previous 7-day inspection reports and previous annual inspection was conducted to understand the status and condition of the FGD Landfill prior to the 2024 annual inspection.

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

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

There has been no changes to the geometry of the landfill since the last inspection other than the placement of additional waste.

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

It is estimated that the approximate volume of CCR contained in the Landfill at the end of July 2024 to be approximately 11,407,000 CY.

#### 4.3 Definitions of Visual Observations and Deficiencies

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:

<u>Good:</u>	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.
<u>Poor:</u>	A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.
<u>Minor:</u>	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.
<u>Significant:</u>	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 any signs of distress or malfunction of the landfill and appurtenant structures. Specific items inspected included structural elements of the landfill perimeter berms, temporary and final covers, drainage features, leachate ponds, open cells, and appurtenances such as chimney drains. Overall, the facility is in good condition. The landfill is functioning as intended with no signs of structural weakness or conditions which are disrupting to the safe operation of the landfill. Inspection photos are included in Attachment A - Photolog.

- 1. The North Valley Leachate holding pond was in good condition. The exposed membrane was in good condition and the pond was being operated with adequate freeboard as shown in Photograph 1 and 2.
- 2. The North Valley Sediment Collection Pond was in good condition. The upstream slope vegetation was healthy and maintained to less than 12-inches. The drainage structures were not blocked with debris and no erosion was observed at the outlets of the structures. The turbidity curtains were properly staked and seemed to be functioning as they were designed as shown in Photograph 3.
- 3. The soil nail wall along the northern and southern limits of the North Valley Sediment Collection Pond was in good condition with proper alignment as shown in Photographs 4 and 5.
- 4. The South Valley Leachate holding pond was in good condition. The downstream slope vegetation was well maintained, and the exposed membrane was in good condition as shown in Photographs 6, 7, and 8.
- 5. The South Valley Sediment Collection Pond was in good condition. The upstream slope vegetation was healthy and maintained to less than 12-inches. The drainage structures were not blocked with debris. The turbidity curtains were properly staked and seemed to be functioning as they were designed as shown in Photographs 10 and 11.
- 6. The landfill vegetated cover was in good condition and well maintained as shown in photograph 12, 13, and 14.
- 7. The landfill cover drainage features are in satisfactory condition. We should note that some minor erosion was observed in Sequence 2 as shown in Photograph 15. The minor erosion should be monitored and addressed before the erosion becomes significant. Other landfill drainage features were in good condition and functioning as designed as shown in Photograph 13, 14, and 22.
- 8. The active areas of the landfill were in satisfactory condition with functioning chimney drains as shown in Photographs 17, 18, 19, and 21.
- 9. The Plateau Stormwater Runoff Pond was in good condition. The upstream slopes show no signs of erosion and the outlet structure was free of debris as shown in Photograph 20.

### 4.5 Changes in Stability or Operation (257.84(b)(2)(iv))

Based on interviews with plant personnel and field observations there are no changes that affect the stability and operation of the Landfill.

# 5. Summary Findings

### 5.1 General Observations

The following general observations were identified during the visual inspection:

- 1. In general, the landfill is functioning as intended with the active disposal area placing and compacting CCR material that is sloped to drain 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 as required. Vegetation is well established on the landfill cover and pond embankments. Other erosion and sedimentation controls are in place and actively being maintained.

### 5.2 Maintenance Considerations

The maintenance items are provided for consideration:

- 1. Continue routine mowing of final and temporary covers to ensure proper vegetative growth.
- 2. Address issues like minor animal burrows and minor erosion rills before they become significant.
- 3. Continue to check site culverts, ditches, outfall structures for debris/blockages to allow the site stormwater to flow as it was designed.

#### 5.3 Items to be Monitored

The following items were identified during the visual inspection as items to be monitored:

1. Item 15 – Minor erosion observed in sequence 2 drainage feature. The minor erosion should be monitored and addressed before the erosion becomes significant.

# 6. Deficiencies (257.84(b)(2)(iii))

During an inspection on January 15, 2020, there was water observed underneath the liner in the eastern bowl of Sequence 4. This observation was identified as a deficiency, and several interim repairs were completed during 2020. An investigation was undertaken in 2021 and 2022 so a repair plan could be developed. Corrective activities on the deficiency have confirmed that the underdrain system in the area was insufficient. Work to rebuild the underdrain system and composite liner system was completed in 2024, prior to the annual inspection.

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 7-day 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 <u>bgpalmer@aep.com</u> or Bryan Brunton at 614-716-3090 <u>bwbrunton@aep.com</u>.











Project: Client:	Amos Power Plant, CCR Lar American Electric Power	ndfill Inspection GEI Project:	2305686
PHOTOGRAPH NO: 1	<b>Date:</b> July 22, 2024 11:49 AM	LATITUDE: 38.48671886	Longitude: -81.86113655
DIRECTION: 130	SITE LOCATION: PUTNAM COUNTY, WE	st Virginia	
DESCRIPTION:			
North Valley Leachate Holding Pond. Upstream Slope – Looking West. General Photo, Typical Conditions.			
	Clorester St.	a the set of the	
рното ву:			
GEI CONSULTANTS, INC.			
PHOTOGRAPH NO: 2	<b>Date:</b> July 22, 2024 11:53 AM	LATITUDE: 38.48649933	LONGITUDE: -81.86126069
DIRECTION: 229	SITE LOCATION: PUTNAM COUNTY, WE	ST VIRGINIA	
DESCRIPTION: North Valley Leachate Holding Pond. North soil nail wall – Looking Northwest. General Photo, Typical Conditions.			
GEI CONSULTANTS, INC.			



Project: Client:	Amos Power Plant, FGD Landfill InspectionAmerican Electric PowerGEI Project:2305686		
PHOTOGRAPH NO: 3	<b>Date:</b> July 22, 2024 11:56 AM	LATITUDE: 38.48692397	Longitude: -81.86060406
direction: 265	SITE LOCATION: PUTNAM COUNTY, WE	ST VIRGINIA	
DESCRIPTION:			
North Valley Sediment Collection Pond. Upstream slope – Looking North. General Photo, Typical Conditions.			
	and the		ALL AND A
РНОТО ВУ:			
GEI CONSULTANTS, INC.			
PHOTOGRAPH NO: 4	<b>DATE:</b> July 22, 2024 11:57 AM	LATITUDE: 38.48678938	Longitude: -81.86054629
DIRECTION: 352	SITE LOCATION: PUTNAM COUNTY, WE	ST VIRGINIA	
<b>DESCRIPTION:</b> North Valley Sediment Collection Pond. South soil nail wall in north valley pond complex – Looking East. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			



Project:	Amos Power Plant ECD Landfill Inspection		<b>ULI</b> Consultants	
Client:	American Electric Power	GEI Project:	2305686	
PHOTOGRAPH NO: 5	<b>Date:</b> July 22, 2024 12:00 РМ	LATITUDE: 38.48733888	Longitude: -81.86138961	
DIRECTION: 335	SITE LOCATION: PUTNAM COUNTY, WE	ST VIRGINIA		
DESCRIPTION: North Valley Sediment Collection Pond. North soil nail wall in north valley pond complex – looking East. General Photo, Typical Conditions.				
рното ву: GEI Consultants, Inc.				
PHOTOGRAPH NO: 6	<b>Date:</b> July 22, 2024 12:07 РМ	LATITUDE: 38.47804669	Longitude: -81.85920197	
DIRECTION: 299	SITE LOCATION: PUTNAM COUNTY, WE	ST VIRGINIA		
DESCRIPTION: South Valley Leachate Holding Pond. Downstream slope of embankment. General Photo, Typical Conditions.				
РНОТО ВУ:				
GEI CONSULTANTS, INC.				



Project:	Amos Power Plant, FGD Lar	ndfill Inspection	
Client:	American Electric Power	GEI Project:	2305686
PHOTOGRAPH NO: 7	<b>DATE:</b> July 22, 2024 12:09 PM	LATITUDE: 38.4787987	Longitude: -81.85839207
DIRECTION: 152	SITE LOCATION: PUTNAM COUNTY, WE	ST VIRGINIA	
DESCRIPTION:			
South Valley Leachate Holding Pond. Upstream Slope – Looking Southeast. General Photo, Typical Conditions.			
РНОТО ВУ:			
GEI CONSULTANTS, INC.			
PHOTOGRAPH NO: 8	<b>Date:</b> July 22, 2024 12:11 РМ	LATITUDE: 38.47878293	LONGITUDE: -81.85888616
direction: 72	SITE LOCATION: PUTNAM COUNTY, WE	ST VIRGINIA	
DESCRIPTION:			
South Valley Leachate Holding Pond. East area, Upstream Slope – Looking South. General Photo, Typical Conditions.			
GEI CONSULTANTS, INC.			



Project: Client:	Amos Power Plant, FGD Lar American Electric Power	ndfill Inspection GEI Project:	2305686
PHOTOGRAPH NO: 9	<b>D</b> ате: July 22, 2024 12:13 РМ	LATITUDE: 38.47896307	Longitude: -81.85877818
DIRECTION: 166	SITE LOCATION: PUTNAM COUNTY, WE	st Virginia	
DESCRIPTION:			
South Valley Sediment Collection Pond. Emergency Spillway Channel. General Photo, Typical Conditions.			
РНОТО ВУ:			
GEI CONSULTANTS, INC.			
PHOTOGRAPH NO: 10	<b>Date:</b> July 22, 2024 12:14 РМ	LATITUDE: 38.47874526	Longitude: -81.85855176
direction: 333	SITE LOCATION: PUTNAM COUNTY, WE	st Virginia	
DESCRIPTION:			
South Valley Sediment Collection Pond. Upstream Slope – looking Northeast. General Photo, Typical Conditions.			
GEI CONSULTANTS, INC.			



Project:	Amos Power Plant, FGD Landfill Inspection			
Client:	American Electric Power	GEI Project:	2305686	
PHOTOGRAPH NO: 11	<b>DATE:</b> July 22, 2024 12:16 PM	LATITUDE: 38.47874399	Longitude: -81.85849955	
DIRECTION: 263	SITE LOCATION: PUTNAM COUNTY, WEST	Virginia		
DESCRIPTION:				
South Valley Sediment Collection Pond. Decant Structure, Interior of Pond. General Photo, Typical Conditions.				
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PHOTO BY.				
GEI CONSULTANTS, INC.				
PHOTOGRAPH NO: 12	DATE: July 22, 2024 12:21 PM	LATITUDE: 38.47979685	LONGITUDE: -81.85565021	
DIRECTION: 247	SITE LOCATION: PUTNAM COUNTY, WEST	Virginia		
DESCRIPTION:				
Sequence 3. Final Cover. General Photo, Typical Conditions.				
GELCONSULTANTS INC				
GEI CONSOLIANIS, INC.				



Project: Client:	Amos Power Plant, FGD Land American Electric Power	Ifill Inspection GEI Project:	2305686
PHOTOGRAPH NO: 13	<b>Date:</b> July 22, 2024 12:24 РМ	LATITUDE: 38.47950271	Longitude: -81.85509303
DIRECTION: 42	SITE LOCATION: PUTNAM COUNTY, WEST	VIRGINIA	
<b>DESCRIPTION:</b> Sequence 3. Perimeter Ditch. General Photo, Typical Conditions.			
РНОТО ВУ:			
GEI CONSOLIANTS, INC.			



Project:	Amos Power Plant, FGD Landfill Inspection		
PHOTOGRAPH NO: 14	DATE:		LONGITUDE:
DIRECTION: 29	SITE LOCATION: PUTNAM COUNTY WES		-01.03000002
DIRECTION. 25	STE LOCATION. POTNAM COUNTY, WES		
DESCRIPTION:			
Sequence 2. Interim Cover, down to 950 bench. Final Cover below 950 bench.			
PHOTO BY			
GEI CONSULTANTS, INC.	<b>D</b>		
PHOTOGRAPH NO: 15	DATE: July 22, 2024 12:33 PM	LATITUDE: 38.48271702	-81.85881576
DIRECTION: 342	SITE LOCATION: PUTNAM COUNTY, WES	T VIRGINIA	
DESCRIPTION:			
Sequence 2. Drainage Feature. General Photo, Monitor Conditions.			
GEI CONSULTANTS, INC.			



Project: Client:	Amos Power Plant, FGD Lar American Electric Power	ndfill Inspection GEI Project:	2305686
PHOTOGRAPH NO: 16	<b>DATE:</b> July 22, 2024 12:38 PM	LATITUDE: 38.48507772	Longitude: -81.85514404
DIRECTION: 120	SITE LOCATION: PUTNAM COUNTY, WE	ST VIRGINIA	
<b>DESCRIPTION:</b> Sequence 2. Interim Cover – Looking South from Sequence 4. General Photo, Typical Conditions.			
			S. S. P
рното ву:			
GEI CONSULTANTS, INC.			
PHOTOGRAPH NO: 17	<b>Date:</b> July 22, 2024 12:39 РМ	LATITUDE: 38.48513934	Longitude: -81.85523918
direction: 24	SITE LOCATION: PUTNAM COUNTY, WE	ST VIRGINIA	
DESCRIPTION: Sequence 4. Active Material Placement. General Photo, Typical Conditions.			
GEI CONSULTANTS. INC.			



Project: Client:	Amos Power Plant, FGD Landfill InspectionAmerican Electric PowerGEI Project:2305686			
PHOTOGRAPH NO: 18	<b>Date:</b> July 22, 2024 12:41 РМ	LATITUDE: 38.48518156	Longitude: -81.85538021	
DIRECTION: 195	SITE LOCATION: PUTNAM COUNTY, WES	st Virginia		
DESCRIPTION:				
Sequence 4. Bottom Ash Stock Piles. General Photo, Typical Conditions.				
рното ву:				
GEI CONSULTANTS, INC.				
PHOTOGRAPH NO: 19	<b>Date:</b> July 22, 2024 12:53 РМ	LATITUDE: 38.48391043	Longitude: -81.85686828	
direction: 54	SITE LOCATION: PUTNAM COUNTY, WE	ST VIRGINIA		
DESCRIPTION:				
Sequence 1, 2 and 3 Active Areas. Note Chimney Drains, Typical Conditions.				
РНОТО ВҮ:				
GEI CONSULTANTS, INC.				



Project: Client:	Amos Power Plant, FGD Lar American Electric Power	ndfill Inspection GEI Project:	2305686	
PHOTOGRAPH NO: 20	<b>DATE:</b> July 22, 2024 1:02 PM	LATITUDE: 38.48469649	Longitude: -81.85056109	
DIRECTION: 104	Site Location: Putnam County, West Virginia			
DESCRIPTION: Plateau Stormwater				
Photo, Typical Conditions.				
	A DE LA DEST			
РНОТО ВУ:				
GEI CONSULTANTS, INC.				
PHOTOGRAPH NO: 21	<b>Date:</b> July 22, 2024 1:04 РМ	LATITUDE: 38.48487849	Longitude: -81.85051422	
direction: 209	SITE LOCATION: PUTNAM COUNTY, WE	est Virginia		
DESCRIPTION:				
Sequence 4. Active Area – Looking West. Typical Conditions.				
GEI CONSULTANTS, INC.				



Project:	Amos Power Plant, FGD Landfill Inspection			
Client:	American Electric Power	GEI Project:	2305686	
PHOTOGRAPH NO: 22	<b>Date:</b> July 22, 2024 1:06 PM	LATITUDE: 38.48482844	Longitude: -81.85047605	
direction: 92	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA			
<b>DESCRIPTION:</b> Sequence 4. Perimeter Ditch. General Photo, Typical Conditions.				
PHOTO BY: GEI Consultants, Inc.				