2023 Annual Inspection Report

Gavin Power, LLC

Residual Waste Landfill

Gavin Power Plant
Cheshire, Ohio

5 January 2024

Project No.: 0679646

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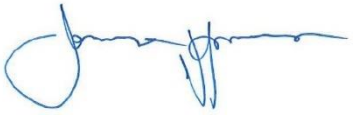 James Hemme, P.E., L.R.S., M.B.A. *Professional Engineer*		 Michael Eisen, P.E., M.B.A. *Professional Engineer*

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CONTENTS

List of Tables

List of Attached Figures

Acronyms and Abbreviations

BAP	Bottom Ash Pond
CCR	Coal Combustion Residual
CFR	Code of Federal Regulations
Charah	Charah Solutions, Inc.
ERM	ERM Consulting & Engineering, Inc.
FGD	Flue Gas Desulfurization
FAR	Fly Ash Reservoir
GCL	Geosynthetic Clay Liner
HDPE	High-Density Polyethylene
NPDES	National Pollutant Discharge Elimination System
OEPA	Ohio Environmental Protection Agency
Plant	Gavin Power Plant
PTI	Permit to install
PVC	Polyvinyl chloride
RWL	Residual Waste Landfill
UV	Ultraviolet

1. INTRODUCTION

The Residual Waste Landfill (RWL) at the Gavin Power Plant (Plant) in Cheshire, Ohio, is subject to the Code of Federal Regulations (CFR) Title 40, Part 257, Subpart D, "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," commonly referred to as the Coal Combustion Residuals (CCR) Rule. The CCR Rule requires an annual inspection and reporting for operating CCR landfills. In addition, any lateral expansion of the CCR unit that occurs between annual inspection reports must be examined and included in the subsequent annual inspection report.

This Annual Inspection Report of the RWL has been prepared by ERM Consulting & Engineering, Inc. (ERM) to comply with the requirements of the CCR Rule, 40 CFR § 257.84.

1.1 Summary of Conditions of Annual Inspection

The annual inspection of the RWL was performed by Mr. James Hemme, P. E., the certifying Professional Engineer in the State of Ohio and Mr. Michael Eisen, P.E. of ERM. Mr. Richard Fuller, Landfill Process Owner at Gavin Power, is the facility contact and supported the inspection activities. Other members of the Gavin Power team, including their contractors, assisted with logistics and provided data for the completion of the inspection and report. In addition, 40 CFR § 257.84(a), weekly and monthly inspections were completed on the leachate collection/treatment ponds and on the residual waste landfill by Mr. Richard Fuller, the Landfill Process Owner at Gavin Power.

The inspection for the RWL was performed on 11 October 2023. Weather consisted of clear skies, mostly sunny, light wind, and temperatures ranging from 50 degrees Fahrenheit (°F) to 75°F. The inspection was initiated with a safety briefing from Mr. Fuller.

The inspection route started at the Southern end of the RWL at Pond No. 1 and associated vertical flow wetlands, then proceeded to the center of the RWL to the peak of Phase F2 and J areas, and then north towards Phase H and I as well as Pond No. 6. Following Pond No. 6, the inspection route proceeded south towards Pond No. 2 and the associated vertical flow wetland. The inspection then continued north towards Ponds No. 3 and No. 5 areas, which included their respective vertical flow wetlands.

Phase I protective cover area was completed in June 2022 and was certified by the Ohio Environmental Protection Agency (OEPA) in a report dated 13 September 2022. The OEPA provided operational approval for the two active phases (Phases H and I) on 16 September 2022. At the time of the inspection, bottom ash from the Bottom Ash Pond (BAP) project was being placed over the liner system in Phases H and I. Maintenance activities near the ponds and on the roadways were observed as documented in the report. Please refer to **Figure 1** for the Site Location Map and **Figure 2** for the Current Progress Residual Waste Landfill.

1.2 Regulatory Cross-Reference Table

In compliance with 40 CFR § 257.84(b)(1), this inspection and inspection report for the RWL were completed by James Hemme, a qualified Professional Engineer in the State of Ohio. **Table 1**, below, is a regulatory cross-reference table that describes the inspection requirements and the respective locations in this report demonstrating compliance to each requirement.

Table 1: Federal Regulatory Requirement Cross-Reference Table

Federal Regulatory Requirement Summary	Location in the Annual Report
§ 257.84(b)—Annual inspections by a qualified professional engineer	Sections 1.1 and 1.2
§ 257.84(b)(1)(i)—A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of inspections by a qualified person, and results of previous annual inspections)	Section 4
§ 257.84(b)(1)(ii)—A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit	Section 3
§ 257.84(b)(2)(i)—Any changes in geometry of the structure since the previous annual inspection	Section 3
§ 257.84(b)(2)(ii)—The approximate volume of CCR contained in the unit at time of the inspection	Section 2.1
§ 257.84(b)(2)(iii)—Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR	Section 3; Appendix A
§ 257.84(b)(2)(iv)—Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection	Section 5.3; Appendix A

2. GAVIN PLANT INFORMATION

2.1 Facility Overview

The Gavin Power Plant is located in Gallia County, Ohio, immediately south of Cheshire, Ohio, and adjacent to State Route 7. The Plant is also adjacent to the western shoreline of the Ohio River. Nearby towns include Addison, Ohio, and Point Pleasant, West Virginia. The RWL is located northwest of the Plant, as depicted on **Figure 1**; the currently permitted waste boundaries are indicated.

The RWL is permitted by the OEPA to accept and dispose of CCR material in accordance with Ohio Administrative Code 3745-30. Typically, approximately 98 percent of this material is FGD (Flue Gas Desulfurization) by-product (consisting of scrubber cake, fly ash, and lime) while the remaining 2 percent consists of other approved disposal materials (bottom ash, lime ball mill rejects, coal pulverizer rejects, bottom ash pond sediments, and sand/moss mixture from the vertical flow wetlands). During 2023 as a result of mass excavation of bottom ash from the Bottom Ash Pond (BAP) for disposal in the RWL, the ratio of FGD disposal compared to other materials for this year will be lower this year compared to prior to the implementation of the BAP closure.

In 1994, the RWL was permitted for a capacity of 49 million cubic yards. In 2014, the RWL was authorized to expand horizontally and vertically, under Permit-to-Install (PTI) #06-08447, increasing the capacity of the RWL by 45.5 million cubic yards to a total of 94.5 million cubic yards. In 2023, the facility reported an estimated disposal volume of 3.15 million cubic yards (~4.0 million tons) of CCR. Including the volume from 2023, the RWL currently contains approximately 64.5 million cubic yards up from 61.3 million cubic yards of CCR in 2022.

Construction related to the expansion has been ongoing since 2016. During the past year, third party construction monitoring for Phase I was performed and certified by Terracon. Since 2016, construction of the leachate/sedimentation Pond No. 5 and vertical flow wetlands associated with the landfill pond outfalls for Ponds 1, 2 and 3 has been completed. In January of 2019, the Plant received approval from OEPA to construct Phase I of the RWL prior to Phase G. Bulk excavation and liner construction activities were observed during the 2019, 2020, and 2021 inspections. Since the 2022 inspection, lateral expansion construction activities for Phase I have continued in the area depicted on **Figure 2**.

Since the inspection in 2022, Phase H, located in the northeast sector of the landfill, has continued being filled uniformly with FGD. During the 2023 inspection, FGD was being placed in Phase H and bottom ash from the BAP closure was observed to be placed in Phase I. In addition, the active surface of the FGD was generally observed to be mildly sloped (estimated at 1 to 2%) and appeared to be maintaining positive drainage for surface-water run-off.

The liner system utilized in Phase H and Phase I consists of the following layers in descending order:

- A minimum top protective layer of 30” of FGD to protect the leachate collection layer;
- A geonet composite leachate collection/drainage layer on the slopes, and a 12-inch thick rounded gravel leachate collection layer on flatter sections around the leachate collection piping;
- A 30-mil polyvinyl chloride (PVC) geomembrane; and
- A reinforced geosynthetic clay liner (GCL) overlying a prepared soil subgrade consisting of native soil materials including a top 6” minimum of “select subgrade” clay cushion layer.

During the 2023 annual inspection, the geonet composite leachate collection layer was observed along the perimeter of Phase I and the protective layer of FGD had been placed across Phase I. ERM also observed bottom ash from the BAP was being placed near the center of Phase I south of Pond 6 (Appendix A, Photograph 21).

2.2 Residual Waste Landfill Operations

Charah Solutions of Louisville, Kentucky (Charah) is the current contractor to conduct daily operations at the RWL since 2021 with oversight by Gavin Power. Daily operation and site maintenance activities include hauling and distributing CCR, dredging accumulated solids from within the settling ponds and channels, placing cover material, and maintaining vegetation. These activities are documented on a daily log that is maintained by Gavin Power. Fugitive dust controls for the landfill operations are implemented based on current site conditions and include watering, using chemical suppressants, controlling the speed of construction vehicles, and cleaning paved roads. On-site unpaved haul roads are maintained on a daily basis through the use of motor grader/roller equipment. In 2023, bottom ash from the BAP was applied to the active haul roads and roadways as needed to establish and maintain a smooth and stable surface for traffic. Gavin Power conducts weekly and monthly inspections and reports any deficiencies to Charah to address and repair.

3. RESIDUAL WASTE LANDFILL VISUAL INSPECTION

The 2023 annual visual inspection conducted for the RWL on October 11, 2023 is summarized below. Photographs referenced herein are located in **Appendix A**. The approximate locations where the photographs were taken are indicated in **Figure 3**. Qualitative terms used herein to describe the inspection are summarized in **Appendix B**.

Overall, the RWL was observed to be in satisfactory condition (as defined in **Appendix B**). This includes the roads and other maintained infrastructure and lateral expansion areas to the extent they were observable. Further, construction activities are progressing in general conformance with the 2012 Final Permit-To-Install Application, Expansion of the Gavin Plant Residual Waste Landfill, Section C.8. ERM personnel did not observe evidence of obvious settlement, misalignment, significant erosion, tension cracks, or other signs of possible instability, movement, or significant erosion along the slopes. ERM did not observe visual evidence indicating that storm water was impounding in the designated RWL area (except in small sedimentation collection traps) or along roadways. Since the 2022 annual inspection, Phase H has been the predominant location for placement of CCR for the duration of 2023. Changes in the geometry of the RWL were observed during the inspection. During the 2022 inspection, the eastern and southern areas near the top of Phases F2 and J were being graded and covered with soil for revegetation. During the 2023 inspection, ERM observed grading of the slopes and covering with soil for revegetation being completed in Phases F2 and J. CCR placement within the lateral expansion area (Phase H) has continued upward to twenty or more feet vertically above the height of the adjacent access road (as observed in Photograph 52). As Phase H has increased in elevation from the placement of FGD, cover soils at the northern interface slope of Phases F2/J with Phase H were observed to have been removed incrementally for reuse. Cover soil removal allows FGD from Phase H to be placed directly on top of the previously placed FGD in Phases F2/J. Windrows/stockpiles of the salvaged soil were visible on the slope above the active FGD operations area (as observed in Photograph 53).

3.1 Haul and Access Roads

The haul roads in active areas of CCR placement use bottom ash as a base course (as observed in Photographs 1, 2, and 3). This base course compacts well and withstands repeated heavy equipment traffic based on experience. The haul roads observed by ERM appeared to be stable during the site drive/walkthrough, and there was no visual evidence of significant distress (i.e., rutting or pumping). The roads had positive drainage from the centerline or were sloped to an adjacent drainage channel and there was no visible evidence of ponding water on the roadway surface. Drainage channels paralleling the roadways also captured storm water runoff from adjacent slopes, which is directed to stable outlets that ultimately discharge to the multiple surrounding site treatment ponds. ERM observed sporadic evidence of erosion in the channel bottoms or at the connection point/confluence of drainage berms that collect water from the landfill side slopes to the channels. Rock check dams were observed as best management practices (BMPs) for stormwater deceleration devices located at regular intervals within the constructed channels to slow runoff rates and to capture sediments. Overall, roadside channels appeared satisfactorily maintained. During the inspection, ERM observed that sediment build-up behind the rock check dams in the roadside channels seemed to have been recently cleaned at various locations. Channels are inspected on a biweekly basis as part of the routine maintenance and deficiencies are addressed and repaired as needed.

There were several sections of permanent roads that have a limestone gravel base course, as depicted in Photographs 4 and 9. These roads also were observed to be stable with no visible evidence of distress. More frequently used roadways incorporate robust drainage channels adjacent to slopes, which were positively graded and included rock check dams (Photograph 6).

Following the 2022 annual inspection recommendations, Gavin installed additional rock check dams to help reduce erosion and rilling into the underlying FGD material. Visible improvements were seen during the 2023 annual inspection, such as the channel on the south side of the RWL (Photograph 54). ERM further recommends that individual areas continue to be repaired and monitored in accordance with the ongoing maintenance program. If issues persist, increasing the number of rock check dams to reduce channel flow velocities and adding supplemental riprap reinforcement should be considered and installed as needed. ERM also recommends continued maintenance of the sediment traps below areas where erosion has been noted.

Near the top (north end) of the western access road, the roadside drainage channel was observed to be incised with vertical walls of 2 to 3 feet and total depth of 6 feet in several isolated areas. ERM recommends that the channels be partially filled with appropriate and stable material and covered with soil and riprap as needed to re-establish positive drainage.

3.2 Slopes and Slope Cover

Approximately 90 percent of the currently inactive landfill slope surface area appears to have thriving, stable vegetation, and 10 percent of the surface area is either in the process of stabilization/revegetation (former CCR direct seed areas) or was observed to have been recently seeded and mulched. Slopes near the summit of Phase F2 and J were also observed to have active grading occurring in preparation for deposition of intermediate cover. In general, intermediate cover consisted of a 6- to-12-inch-thick layer of soil. The western and northern slopes have received intermediate cover that is well vegetated (Photographs 5, 8, and 14). As portions of the lateral expansion (Phases H, I and G) are constructed and filled with CCR, this intermediate cover of soil will be removed and reused for cover in other areas of the landfill. This activity was observed by ERM to be on-going on the northern slope as the level of CCR in Phase H increases in elevation (Photograph 11 through 13). Windrowed salvaged soil from the previous slope is visible in the right center edge of Photograph 11.

There were no visual observations of structural weakness within the RWL (e.g., slips, soil tension cracks, sinkholes) noted during the annual inspection. No indications of residual waste movement that might alter the geometry of finished slopes or overall stability of the RWL were identified.

The areas with final cover included a reported minimum 3-foot-thick cap consisting of a 2-foot layer of barrier soil and a 1-foot layer of soil capable of supporting vegetation (Photographs 5 and 8). The areas that had received final cover exhibited well-established vegetation.

There were infrequent instances where notable erosion rills/gullies were observed (as indicated in representative Photograph 17) in the surface of the intermediate cover. Sedimentation was fully contained in these areas and directed toward the facility treatment ponds. There was no visible evidence that these isolated areas of erosion have the potential to disrupt the operation and safety of the RWL or that observed erosion features were creating an unstable situation. We recommend that these minor erosion areas be repaired and reseeded in the Spring of 2024. In the interim, to the extent practical, upslope runon should be minimized in these areas through common industry standard maintenance practices such as reworking the area with temporary seeding or through run-off diversion to prevent water from flowing over the top of slope.

In the past, the Gavin Power Plant team performed direct seeding of FGD material, which was only partially successful in establishing vegetation. The Gavin Power Plant team thereafter began covering these areas with soil to promote more vigorous stands of vegetation growth. Some areas with FGD direct seeding still exhibit poor vegetative growth (as indicated in Photographs 3 and 9) but this was observed to a much-reduced extent when compared to previous inspections. These isolated areas of the slopes, where direct seeding of the placed FGD was attempted, continue to be covered incrementally with an intermediate layer of soil to aid in the establishment of vegetation. The application of this intermediate soil

layer as slopes are completed or meet their interim grades are depicted in Photograph 17 (green vegetated area located in upper left side of photo).

In stormwater channels, the Gavin Power Plant team has successfully utilized BMPs such as riprap, periodic rock check dams, and outlet protection to reduce storm water velocity and minimize the potential for erosion. There are isolated instances where sedimentation has filled the voids of placed riprap, which is maintained as needed to minimize sediments reaching the ponds. Erosion rills and gullies were observed in isolated areas but were not identified as a systemic issue (Photograph 17). The overall stability of the cover, good vegetative practices, and proper functioning BMPs of the storm water channels provide evidence that the Gavin Power Plant team is successfully controlling storm water flow on graded slopes within the RWL.

At the summit of the RWL in the center of vertical Phase F2 expansion, an interim elevation of approximately 965 feet has been reached. The fill will remain at that elevation until FGD fill in adjacent constructed cells achieves an approximate equivalent elevation. Surface water at the summit of Phase F2 is managed by chimney drains (Photograph 19) that are connected and flow to the leachate collection system at the bottom of the landfill.

3.3 Sedimentation/Leachate Ponds

Five pond units, specifically Pond Nos. 1, 2, 3, 5, and 6, currently manage sedimentation and storm water and treat leachate generated by the RWL.

Pond No. 1 is located in the Southern end of the RWL and is the oldest treatment pond at the facility. It consists of a primary treatment pond and clarifying pond. The clarifying pond discharges into an associated duplex vertical flow wetland treatment system.

Pond No. 2 is located on the Southeast portion of the RWL facility area and also consists of a primary treatment pond and clarifying pond. The clarifying pond discharges into an adjacent duplex vertical flow wetland treatment system. Pond 2 is preceded by a dual chamber concrete headworks sedimentation basin that is utilized to capture sediments from stormwater from the FGD handling stack-out pad. The FGD handling pad is located to the southeast of the landfill and receives the conveyor carrying FGD from the power station. From this point, FGD is loaded into trucks and hauled to the active disposal area. The FGD handling pad has been designed to direct stormwater runoff to a channel system that is treated in Pond 2. In addition, the original leachate inflow pipe located on the western edge of Pond No. 2 has been redirected through a pump station to discharge into the concrete headworks.

Pond No. 3 is located to the East of the RWL and to the northwest of Pond No. 2 and consists of a primary treatment pond and clarifying pond. The clarifying pond discharges into an adjacent duplex vertical flow wetland treatment system.

Pond No. 5 is located directly north of Pond No. 3. Pond No. 5 discharge flows into the upper north end of Pond No. 3.

The vertical flow wetland treatment systems for Ponds No. 1, No. 2 and No.3/No.5 were installed in 2016 and 2017 and have been designed to perform as additional filtration/treatment system components to remove target pollutants not completely removed by the preceding treatment processes. Flow from the clarifying ponds is directed into the vertical flow wetlands through an inlet structure. The effluent from the various vertical flow wetland systems is discharged through a weir and flow meter station off-site in accordance with the Plant National Pollutant Discharge Elimination System (NPDES) permit (Permit # 0IB00006*PD). Photographs 24 through 28 from Pond No. 1 depict the vertical wetlands, inlet structure, and flow meter station, which are of the same general construction as those used at Pond No. 2 and Ponds No. 3/5.

Pond No. 6, located to the northwest of Phase H and I, is the most recently constructed pond and consists of both a lined primary treatment and a lined clarifying pond (Photographs 22 and 23).

3.3.1 Pond No. 1

Pond No. 1 on the south side of the RWL was observed to be functioning properly during the annual inspection. The sedimentation/treatment portion of Pond No. 1 was observed to contain varying depths of solids, as observable in Photographs 29 and 30. This pond is routinely cleaned of accumulated solids, typically through the use of extended-reach excavators or a floating dredge. Based on a visual assessment, Pond No. 1 was noted to have accumulated sediments below previous 2022 levels (as a result of a net removal of sediments from the pond during 2023).

A build-up of sediments, aggregate, and vegetation was observed in the north end of the pond near the two inflow channels (Photograph 30). For maintenance purposes, these materials should be removed and properly disposed. Stone from the access roadway was observed to be deposited in these inflow channels areas. It is recommended that steps continue to be taken to mitigate the displacement of stone from the roadway by vehicles and during the application of maintenance aggregate to the surface. Also, the liner was observed with multiple small tears and holes in the liner identified around the perimeter of Pond No. 1 but were above the operating water level. No water was standing against these tears, and no discharge through these tears was observed. The small tears identified in the liner noted in the previous inspection have been repaired. ERM recommends that the new tears in the liner be repaired by a similar procedure as part of routine maintenance. The 2022 patched repairs were observed in Pond No. 1 (Photograph 31).

The vertical flow wetlands for Pond No. 1 were observed to be in working order (Photographs 24 through 28).

3.3.2 Pond No. 2

Pond No. 2 on the southeast side of the RWL was observed and appeared to be functioning properly during the inspection. To assist with the removal of FGD solids derived from the stack-out pad and to minimize dredging, Gavin Power operates a concrete settling basin at Pond No. 2 (Photograph 34). This basin is routinely cleaned with an extended-reach excavator. The leachate inflow pipe located on the west side of the Pond No. 2 sedimentation basin has been connected to a pump station which directs the flow into the concrete headworks settling basin for initial treatment prior to entering the southern end of the geosynthetic-lined pond.

The primary treatment pond was observed to be in satisfactory working condition following the maintenance adjustments that continued after the 2020 annual inspection. During 2020 and early 2021, significant spot repairs were made to the geomembrane liner system of this pond. No rips or tears were observed; however, in two isolated areas, a “bunching” of the geosynthetic material was observed. The bunched areas appeared to be intact with no evidence of holes or leakage. ERM recommends that these areas continue to be monitored in 2024 (Photographs 36 and 37).

The primary treatment pond appears to be functioning adequately as evidenced by the visual reduction in color and turbidity as water progresses through the pond (Photograph 35).

Gavin has installed a supplemental, mobile trailer mounted temporary filter system at the edge of the clarifying pond that is part of the Pond No. 2 complex (Photograph 35 in background). This filter system transfers water from the clarifying pond using a suction hose, filters the water and then pumps it into the inflow structures to the vertical flow wetland system. The filter was installed as a voluntary supplemental measure to improve water quality going to the next stage of treatment. The filter system was secured in

the interior of the trailer and was not observed. There were no leaks observed, and the trailer appeared to be in satisfactory condition.

The vertical flow wetland cells for Pond No. 2 were observed to be in satisfactory condition (Photograph 38). The westernmost wetland was functioning during the inspection. The rock lined outflow channel for the system to the South of the vertical ponds appeared to be functioning properly from a flow standpoint, with no signs of erosion or distress.

3.3.3 Pond No. 3

Pond No. 3 on the northeast side of the RWL was observed and appeared to be functioning satisfactorily during the inspection. Both the sedimentation basin and clarifying basin contained water, but leachate was being captured at the influent pipe and was being temporarily pumped into the head of Pond No. 5 (Photograph 42). On the northwestern side of Pond No. 3, a culvert continues to direct water from a stormwater channel from the RWL into the primary treatment pond. This culvert was originally a corrugated metal pipe but has been partially replaced on the downstream side with a High-Density Polyethylene (HDPE) pipe. The entrance to this culvert showed excessive corrosion, and ERM recommends replacing the remainder of this culvert with HDPE piping compatible with the previous partial replacement.

Within the primary treatment pond there was significant sediment accumulation observed within the central portion and along multiple embankments (as indicated in Photographs 40 and 41), having increased from observations in the 2022 inspection. This is based on observation that the solids level appeared to be just below the operating water level in much of the pond. The primary treatment pond was undergoing cleanout, via floating dredge (Photograph 44), during the time of inspection; this cleanout activity is to continue into 2024. A number of minor holes and tears in the liner were noted above the operating level of the primary treatment pond.

An area had been excavated within the sediments using a long reach excavator near the outlet structure for the primary treatment pond going to the clarifying pond. This excavated area is intended to provide sufficient space and depth for the floating dredge to begin removing sediments. The dredge was floating in this space during the time of the visit (Photograph 44) but was not operating. A dewatering area has been set up and lined with plastic sheeting to the south of Pond 3. The dewatering area has been designed to return water through a channel into the primary treatment pond. Geotubes for collecting sediment from dewatering activities were present on site but not deployed at the time of the inspection.

Within the clarifying pond, multiple holes and tears were identified in the geomembrane liner during the inspection with some exhibiting vegetative growth from beneath. Surficial layers of a protective PVC geomembrane were also suggesting significant levels of deterioration such as material stiffness due to Ultraviolet (UV) exposure over time and rips/tears. This supplemental surficial PVC geomembrane was previously installed for additional UV protection over the primary geomembrane in the Pond No. 3 clarifying pond and therefore is deemed to be a sacrificial layer. The tears and holes identified in the liner within the clarifying pond were observed to be above the normal operating water level and considered manageable for maintaining design compliance and integrity of the pond. However, repair of the visible damage to the primary treatment and clarifying pond geomembrane will be necessary during suitable weather in 2024. Water levels within this pond should be kept below visible defects such as the identified small holes and tears in the geomembrane until repairs can be made.

Similar to Pond 2, a supplemental, mobile trailer mounted temporary filter system is operating at the edge of the clarifying pond. (Background of Photograph 44). This filter system also transfers water from the clarifying pond using a suction hose, filters the water and then pumps it into the inflow structures to the vertical flow wetland system. The filter system was secured in the interior of the trailer and was not accessible for observation. There were no leaks observed in the area and the trailer appeared to be in

satisfactory condition. It was reported to ERM that the temporary filter has been brought in to provide supplemental treatment of the water as dredging activities occur in Pond 3, which is anticipated to mitigate the suspended solids generated during dredging.

The vertical flow wetlands for Pond No. 3/Pond No. 5 were observed to be functioning properly. However, the discharge seemed to be slightly tinted in color, but there was no observable scour or outlet instability below the permitted Outfall 009 (Photographs 47 and 48). Chemical dosing at the outfall was being inspected during the time of our visit.

3.3.4 Pond No. 5

Pond No. 5 (Photographs 45 and 46) on the Northeast side of the RWL, adjacent to Pond No. 3, was observed to be functioning properly with respect to water flow and sedimentation during the annual inspection. There was no indication of tearing of the geomembrane liner within the basin (Photograph 43). During this inspection it was noted, similar to the 2022 inspection, that there was accumulated water under the Pond No. 5 liner system along a limited section of the southwest edge adjacent to Pond No. 3. This accumulation was evidenced by floating liner at the water interface at the pond operating level. It was also noted that the floating liner was minimal compared to previous inspections.

The facility has made a slit in the geomembrane several feet above the operating level of the pond for purposes of inserting a suction withdrawal pipe for removal of accumulating water originating from beneath the geomembrane. A small pump is utilized to withdraw this water as needed to avoid stress and uplift pressures on the liner system from accumulated water. The facility monitors this accumulation and has continued to utilize personnel to withdraw this water and discharge it into the pond on an as needed basis. This water is reportedly clear and appears to be groundwater but was not observed by ERM during the inspection. It appears, based on the continued reappearance of this condition, that a perched groundwater condition may exist with a connection to the Pond 5 area. The source of this water has not been identified but is apparently not from the pond, since it accumulates above the operating level within the pond, and groundwater results from down gradient monitoring wells do not indicate a release from Pond No. 5.

There were minor punctures noted in the geomembrane liner near the concrete inflow channel to Pond No. 5 (Photograph 49) that may be the result of animal hoofs. Deer tracks were observed in the soil near this location as well as track marks across the liner (Photograph 43). The holes are above the normal operating water level of the pond and 2+ feet away from where leachate and stormwater flows enter the pond. These holes should be repaired as weather conditions allow in 2024. Additional measures for the exclusion and deterrence of whitetail deer from this area should also be explored.

During the inspection the same discharge into Pond No. 5 was observed coming from the inflow to Pond No. 3 (Photograph 42) as noted from last year's inspection. A temporary pump system has been installed that directs collected leachate influent to Pond No. 3 and redirects it through an aboveground PVC force main into the head (Western end) of Pond No. 5. Substantial force main supports consisting of steel pipe stands were observed under the force main during inspection replacing temporary wood material observed last year.

3.3.5 Pond No. 6

Pond No. 6, located to the northwest of Phase H and I, is the most recently constructed pond and was observed to be functioning properly during the annual inspection. Pond 6 consists of a newly constructed primary sedimentation/treatment pond and a clarifying pond. Pond 6 has been constructed with a composite liner system consisting of a HDPE geomembrane over a GCL with an underlying detection zone. To allow for easier cleanout of accumulated sediments during operations, the bottom of the Pond 6 liner system was also constructed with a concrete protective cover. Equipment can operate on top of this

cover and will allow sediment to be removed more efficiently. The concrete cover on the bottom of the pond and partially up the sides to the operating level were observed to be in satisfactory condition where exposed (Photographs 22 and 23). Stone from the access roadway was observed to be present on isolated portions of the pond liner. It is recommended that steps be taken to mitigate the movement of stone from the roadway by vehicles and during the application of maintenance aggregate to the road surface.

The exterior side slopes of the Northeast embankment appeared to have been recently completed with fresh seeding and mulch observed. The outfall for Pond No. 6 discharges into a riprap channel on top of the recently closed former Fly Ash Reservoir (FAR) located to the north of Pond 6. This channel was constructed after the FAR cover was in place and was planned for in the RWL Expansion as well as the FAR Closure Plan. A set of wood steps and handrails has been constructed to access this outfall discharge point for observation and sampling purposes. No flow was observed at this discharge during the inspection. The rock lined outflow channel for the pond appeared to be functioning properly from a flow standpoint, with no signs of erosion or distress.

3.4 Operation

Daily landfill operations are conducted and managed by Charah and overseen by Gavin Power. During the time of the inspection, general maintenance operations were occurring within the facility limits. As required by the PTI issued by OEPA, Gavin Power maintains daily logs of operations and performs daily inspections of the RWL.

Photographs 50 and 51 depict operating conditions at the FGD stack-out pad during the annual inspection. There was minimal FGD production on the day of the inspection, and the material was satisfactorily handled and contained on the pad prior to being loaded into haul trucks for disposal in Phase H.

New activities during 2023 included the continued filling activities in Phase H and minor activities in Phase F2. Disposal in Phase F2 was limited to small areas to achieve final slope grades prior to covering with soil. The vertical phase for Phase F2 was completed in 2020 as the FGD material met the interim maximum height of approximately 965 feet. A soil cover was placed on the top of the FGD summit and vegetation is currently being established. Photographs 10 and 19 depict the placement of the soil cover at this location and the different stages of this process. A series of chimney drains that are connected to the leachate collection system at the bottom of the landfill were observed within the summit area to assist in draining excess surface stormwater.

4. REVIEW OF CCR OPERATING RECORD DOCUMENTS AND PREVIOUS INSPECTION ITEMS

As required by 40 CFR § 257.84(b)(1)(i), a review of the operating record regarding the status and condition of the CCR unit includes the results of inspections by a qualified person and results of previous annual inspections. The following documents were reviewed as part of the CCR operating record:

- Ohio EPA Phase “I” before “G” Alteration Request, approval dated 2 January 2019;
- 2019 Landfill Annual Inspection Report, ERM dated 8 January 2020;
- 2020 Landfill Annual Inspection Report, ERM dated 8 January 2021;
- 2021 Landfill Annual Inspection Report, ERM dated 7 January 2022;
- 2022 Landfill Annual Inspection Report, ERM dated 6 January 2023;
- Seven-day qualified person inspection checklists for the RWL from 5 January 2023 through 13 December 2023;
- American Electric Power Service Corporation (2016). *Gavin Plant Residual Waste Landfill Closure Plan.* Gavin Plant, Cheshire Ohio;
- Gavin Residual Waste Landfill PTI Alteration Request, dated 13 October 2014;
- 2022 OEPA Solid Waste Facility License;
- Stability and Settlement Analysis Report pursuant to Ohio Administrative Code 3745-30-05(C)(5), dated 2 November 2012; and
- Final Permit-To-Install Application Expansion of the Gavin Plant Residual Waste Landfill dated 2 November 2012

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Addressing 2022 Annual Inspection Items

ERM reviewed operational photographs and periodic repairs specified in the 2022 Annual Inspection Report. This included placing the final cap where final grades have been reached as required by OEPA; repairing identified minor geomembrane perforations; seeding and mulching areas to establish vegetation; repairing erosional areas noted at the permanent capped areas; and continuing to remove sediments from all ponds on an as-needed basis. Based on the 2023 annual inspection and a review of weekly inspection reports, the above-identified repair items from the 2022 annual inspection were mostly completed or observed as being underway as part of on-going maintenance and repairs. In particular:

- Identified necessary repairs to the Pond No. 2 liner system and minor repairs in Pond No. 1 observed in 2022 were completed.
- Liner coupon samples were obtained from the ponds and tested for strength characteristics. Evaluation is still in progress.
- Identified maintenance performed on rock check dams and sediment traps where erosion was noted.
- Identified localized bare soil areas that were seeded and fertilized to aid in the revegetation process. There are still a few areas still in need of mulching and seeding as mentioned in the 2022 annual inspection.
- Operations began for the removal of sediments and repairs to the geomembrane liner system at Pond No. 3. The initial step of redirection of influent to Pond No. 5 has occurred and the floating dredge has been brought on site and is being plumbed to begin operation.
- Geomembrane repairs for the clarifying portion of Pond 3 have been budgeted and scheduled for spring/summer 2024.
- Gavin Power Plant has consistently addressed items requiring attention that were identified in the weekly inspection reports.

5.2 Recommendations for 2023

ERM provides the following recommendations for the RWL based on the 2023 inspection:

1. Deficiencies identified during weekly inspections should continue to be documented and addressed in a timely manner as a Best Management Practice. This includes but is not limited to addressing any erosion rills, removal of check dam sediment accumulation, roadway surfacing and leachate seep maintenance and capture.
2. Complete the placement of intermediate soil cover, seed, and mulch on areas of direct FGD seeding where poor vegetative growth has been experienced. Soil pH and nutrient tests are recommended to target appropriate amounts of lime and fertilizer application to accomplish successful vegetative growth while minimizing the potential for over application.
3. Seed and fertilize localized bare soil areas along completed slopes to aid in the revegetation process, adding soil amendments and lime as needed.
4. Repair erosion gullies within the intermediate cover on the northwest end of Phase F2.
5. Continue to monitor stormwater channels such as the roadside drainage channels on the South and West slopes and clean out as necessary, adding rock check dams as necessary in severe erosion areas. Add appropriate fill to isolated sections of channels where excessive depth is being

experienced to alleviate vertical wall and incised conditions. Re-establish appropriate surface conditions and surface water channels.

6. Continue to maintain check dams and continue maintenance of the sediment traps where erosion has been noted.
7. Fill erosional gullies within and at confluences of stormwater conveyance channels and berms adding rock soil and vegetating as appropriate. Add riprap armoring as needed to localized areas where FGD has been exposed.
8. Continue to schedule maintenance and replacement of media in the vertical flow wetlands for Pond No. 1, Pond No. 2, and Pond No. 3 and 5.
9. Continue cleanout of Pond No. 3 in 2024 via floating dredge. This may include culvert repair, removal of vegetative growth, removal of sediments and liner system repair and/or replacement where necessary from both the primary treatment and clarifying portions of Pond No. 3.
10. Within Pond No. 1 continue maintenance and repairs as required. Clean channel inlets of stone and remove woody vegetation from inside pond limits. Continue to remove sediment buildup as needed for proper pond function.
11. Repair small tears and minor perforations identified in the geomembrane liners at Pond No. 1, No. 2, and No. 5. Remove any vegetation prior to repairs. Routinely monitor all ponds for any additional tears and promptly repair where identified. Pond No. 1 and No. 2 should be repaired with similar (i.e., “Hypalon” product) geomembrane using either welding or adhesive techniques. Pond No. 5 liner is HDPE and will require spot welding techniques (i.e., extrusion gun or similar). Repairs should be completed prior to the next annual inspection in October 2024. The facility should continue to maintain current water operating levels below the level of identified liner perforations.
12. Attempt to deter wildlife from the pond areas and make repairs to the liner materials and/or fence as needed.
13. Maintain drainage stone placement around the existing current chimney drains and protect these from sedimentation as intermediate and final cover is placed.
14. Drain water from underneath the pond liner system on the southwest and northwest corner of Pond No. 5 via dewatering perforations. Continue to visually monitor these portions of the pond for water buildup and drain water buildup where identified to avoid the addition of tension into the geomembrane until a permanent solution is implemented. During 2024, it is recommended to further assess the source of the water gaining entrance underneath the liner system and to identify potential steps to prevent the build-up of water under the liner system from recurring. If a correction is identified and implemented, repair the geomembrane dewatering perforations using appropriate patching and leak detection methods once the water source has been identified and further build-up is mitigated.
15. Trim brush and grassy vegetation along and above the northern and Western slopes of Pond No. 5 to prevent progression to woody vegetation in close proximity to the facility.
16. Stone from the access roadway to Pond No. 6 was observed to be on the pond liner. It is recommended that steps be taken to mitigate the displacement of stone from the roadway by vehicles and during the application of maintenance aggregate to the surface.
17. Continue to utilize the mobile trailer mounted filters to assist in maintaining water quality until dredging and related maintenance activities are complete.

5.3 Conclusions

The 2023 annual inspection and document review indicated that the RWL is stable and in satisfactory operating condition, as required by 40 CFR § 257.84(b)(1). ERM observed that the lateral expansion for Phase I has been completed and current operational phases are being conducted in a satisfactory manner. Operators were observed to be performing satisfactory maintenance operations. No changes were observed or identified since the last annual inspection which may affect the stability of the RWL.

Maintenance of Pond No. 3 (recommendation 9 in Section 5.2) should be a priority for 2024. Otherwise, the remainder of recommendations made above are not critical to the current stability of the RWL but should be addressed during 2024 under the Gavin Power Plant maintenance program or as otherwise indicated.

The repair of pond liner systems should continue as was demonstrated with Pond No. 2 during 2022 and 2023.

Further, the source of water under the Pond No. 5 liner system should also be explored to alleviate the need for continued attention to withdraw water from beneath the liner. The facility should continue to frequently inspect for new perforations after currently proposed repairs are complete and anticipate additional geomembrane maintenance requirements in the future.

FIGURES

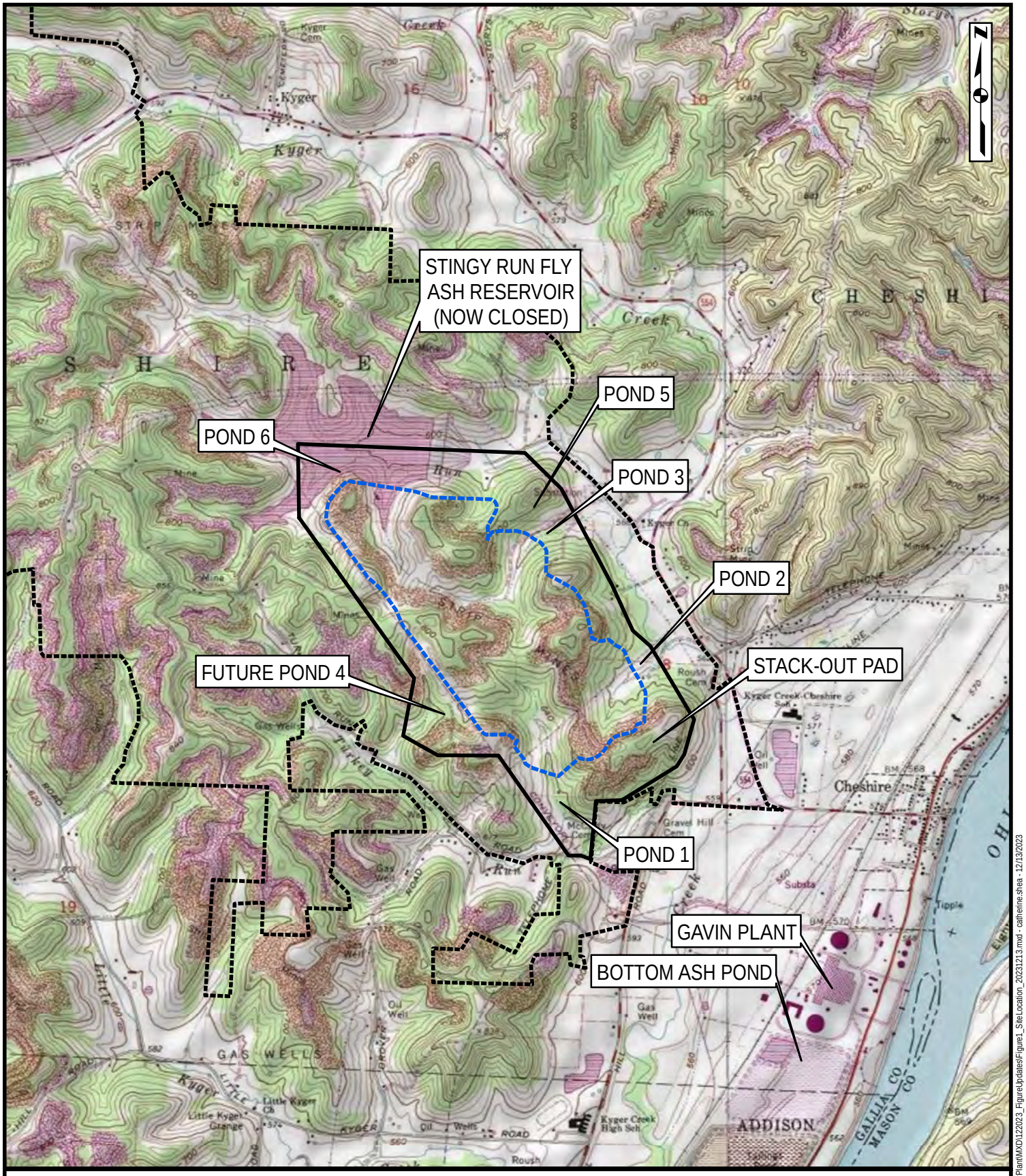

Figure 1: Site Location Map
Gavin Power LLC
Cheshire, Ohio

SOURCE: USGS scanned topographic quad maps provided by National Geographic Society (© 2023).

ERM

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Fly Ash Reservoir

Pond 6

Pond 5

Pond 3

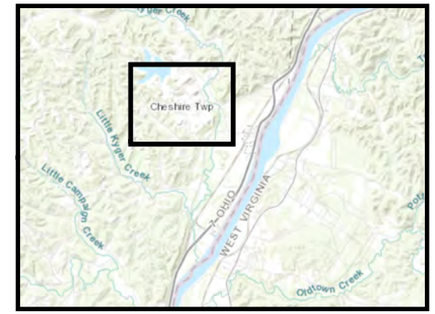
Pond 2

Stack-Out Pad

Residual Waste Landfill

Future Pond 4

Pond 1



Legend

- Phase F2 and J Vertical Expansion
- Phase H Lateral Expansion
- Phase I Expansion
- Permitted Residual Waste Landfill Boundary
- Permitted Facility Boundary
- Gavin Power LLC Property Boundary

NOTES:

1. Locations are approximate
2. Aerial Imagery: USDA NAIP Satellite Imagery, taken on 10/18/2021
3. Phase H Lateral Expansion has been filled to the level of northern and eastern roadway.

N

0 150 300 600 900 1,200 1,500

Feet

Figure 2: Current Progress
Residual Waste Landfill
Gavin Power LLC
Cheshire, Ohio

ERM

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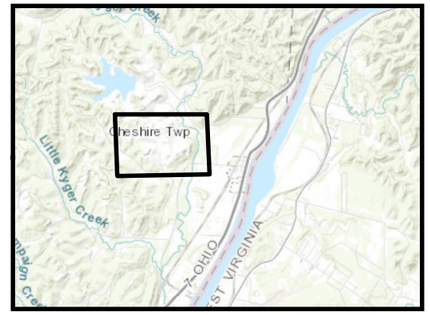

Legend

[#] Photograph Location

NOTES:

1. Locations are approximate
2. Aerial Imagery: USDA NAIP Satellite Imagery, taken on 10/18/2021

N

0 250 500 1,000 1,500 2,000

Feet

Figure 3: Visual Inspection Map
Residual Waste Landfill
Gavin Power LLC
Cheshire, Ohio

ERM

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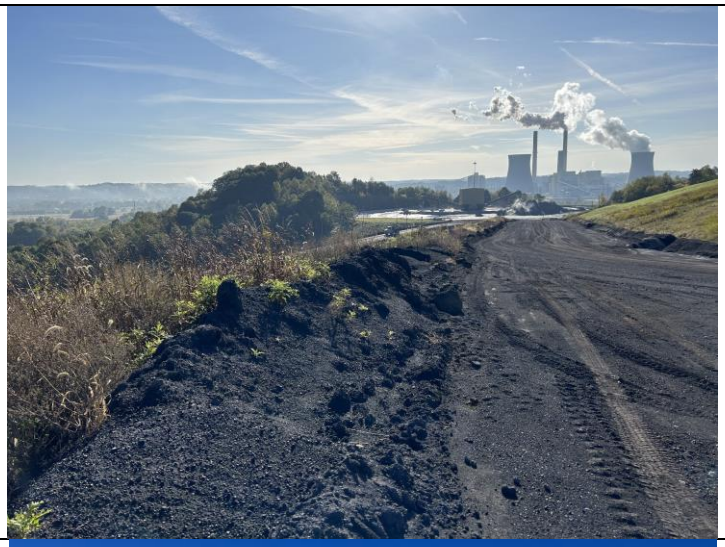
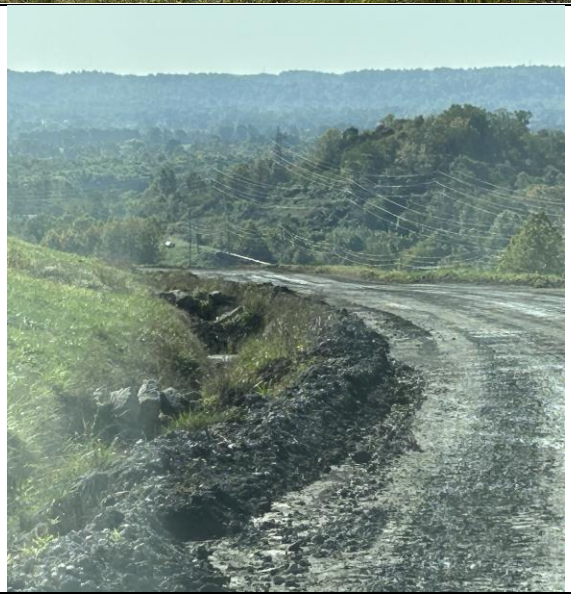
APPENDIX A ANNUAL INSPECTION PHOTOGRAPHS

Residual Waste Landfill

(Photographs taken during 2023 CCR Inspection on 10/11/2023)

Photograph #1 Main haul road (looking southeast).	
Photograph #2 Main haul road heading up the southwestern side of the landfill (looking northwest).	
Photograph #3 Main haul road near east side of landfill. Example of areas needing potential spot seeding in foreground and on right (looking southeast).	

Photograph #4 Access road leading to Pond 2 (looking east).	
Photograph #5 Northwest vegetated slope and temporary sediment basin from landfill construction activities (looking south).	
Photograph #6 Southwest gravel access road and roadside channel with rock check dams (looking southeast).	

Photograph #7 Main haul road near east side of landfill (looking east).	
Photograph #8 West vegetated slope (looking east).	
Photograph #9 View of southern slope. Direct seeded fly ash visible in the center right (looking northeast).	

Photograph #10 View of interim summit of landfill with intermediate soil cover and vegetation growing (looking north).	
Photograph #11 View of Phase H intermediate soil cover (looking northeast).	
Photograph #12 View of Phase H intermediate cover at current high point (looking north).	

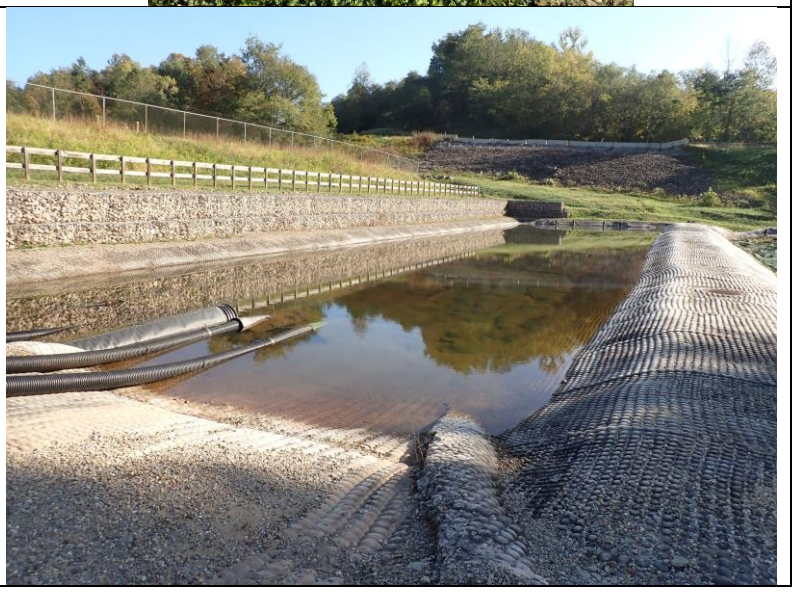
Photograph #13 View of Phase H vegetated western slope, and intermediate soil cover (looking north).	
Photograph #14 Southern slope near summit elevation. (looking north).	
Photograph #15 Northwest edge of RWL Phase I (looking northeast).	

Photograph #16 Haul trucks and dozers continuing Phase H - RWL operations. Final grading of CCR on east slope (looking east).	
Photograph #17 View of Phase H intermediate slope cover (looking east).	
Photograph #18 Eastern slopes. Completed grading recently (looking west).	

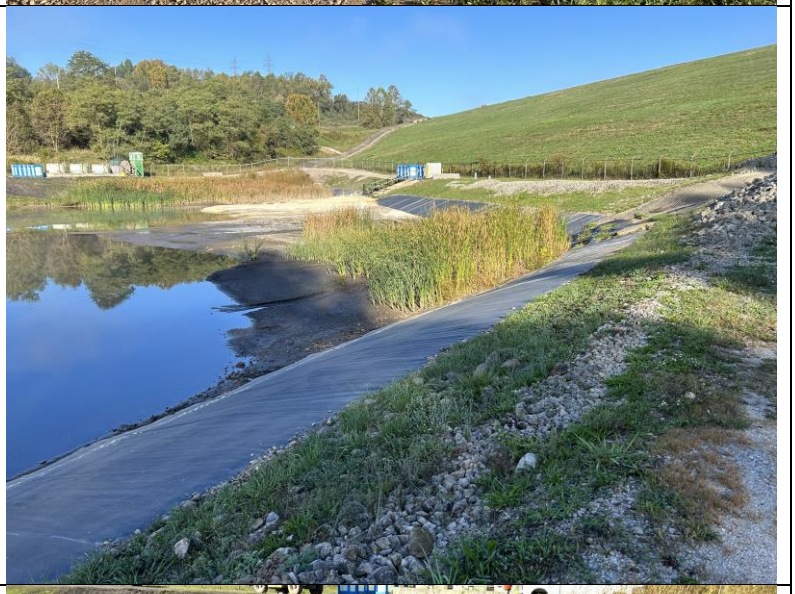
Photograph #19 View of interim summit with chimney drain (looking northwest).	
Photograph #20 Western vegetated slope of summit and RWL grading during landfill construction activities (looking west).	
Photograph #21 RWL overview (looking west).	

Photograph #22 Newly constructed Pond No. 6 clarifying pond (looking southwest).	
Photograph #23 Newly constructed Pond No. 6 primary pond (looking east).	

Pond No. 1

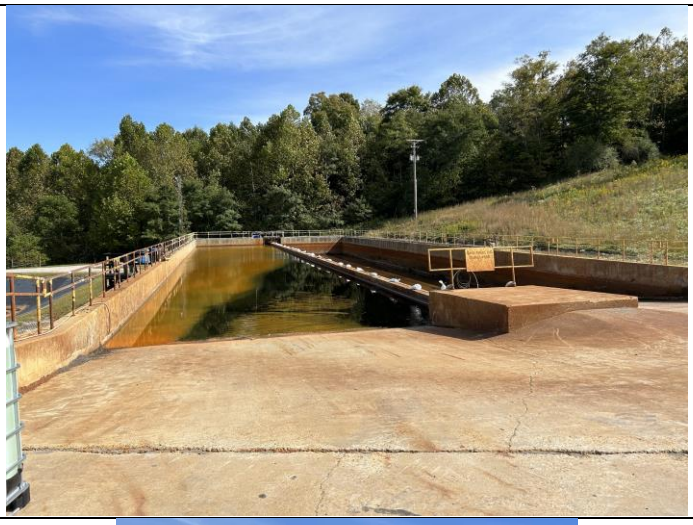
Photograph #24 View of inlet pipes for vertical flow wetland treatment adjacent to Pond No. 1 (looking west).	
Photograph #25 View of Pond No. 1 vertical flow wetland (looking east).	

Photograph #26 View of inlet structures for Pond No. 1 vertical flow wetland.	
Photograph #27 Outlet for vertical flow wetland at Pond No. 1 (looking southeast).	
Photograph #28 Flow measurement flume at outlet for Pond No. 1 vertical flow wetlands (looking east).	

Photograph #29 View of Pond No. 1 (looking north).	
Photograph #30 View of vegetated sediment patch in Pond No. 1. Woody stem vegetation by edge of pond should be removed (looking west).	
Photograph #31 View of sediment, vegetation, and patched repairs on Pond No. 1 north embankment (looking southwest).	

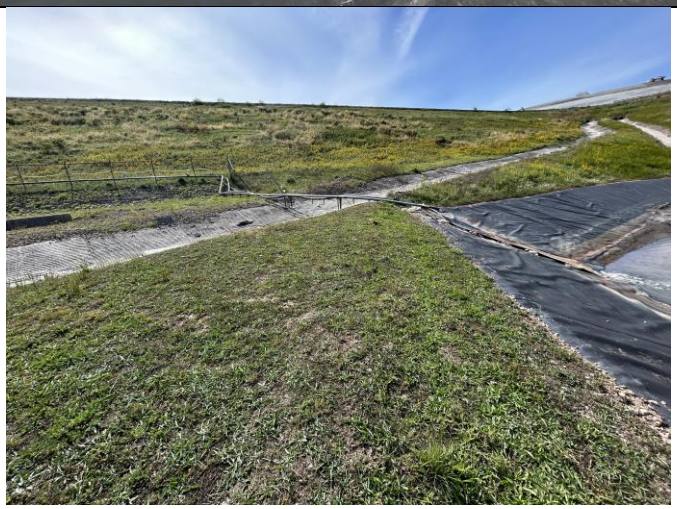
Photograph #32 Pond No. 1 South embankment with vegetation and gravel (looking north).	
Photograph #33 Damaged liner side slope of Pond No. 1 clarifying pond with vegetation growth coming through liner.	

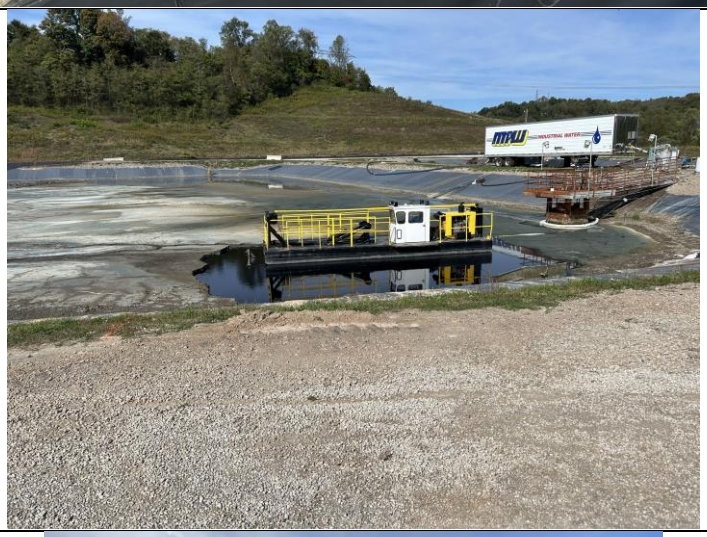
Pond No. 2

Photograph #34 Concrete headworks settling basin adjacent to Pond No. 2 (looking east).	
Photograph #35 Pond No. 2 primary pond from south end of pond (looking north).	
Photograph #36 Pond No. 2 primary pond overview (looking south).	

Photograph #37 Pond No. 2 primary pond liner was observed to have an area of “bunching” that should continue to be monitored (looking east).	
Photograph #38 Vertical flow wetlands for Pond No. 2 (looking south).	
Photograph #39 Flume at outlet for Pond No. 2 vertical flow wetlands (looking east).	

Pond Nos. 3 & 5

Photograph #40 Sediment within Primary Pond No. 3 from southeast corner. Visible sediments just below surface of water (looking south).	
Photograph #41 Sediment and landfill leachate system with chemical treatment system in the background at western side of Primary Pond No. 3 (looking southeast).	
Photograph #42 Force main from Pond No. 3 leachate influent being temporarily routed into Pond No. 5 for treatment (looking northeast).	

Photograph #43 Looking down northern edge of Pond No. 5. Pipe used for periodic removal of water under the liner in the foreground (looking east).	
Photograph #44 Primary Treatment Pond No. 3. Area excavated for floating dredge to begin sediment removal (looking north).	
Photograph #45 Pond No. 5 Southeast corner embankment (looking west).	

Photograph #46	
Pond No. 5 north & west embankment. Minor sediment buildup on top of embankment liner (looking west).	
Photograph #47	
Vertical wetlands for Pond No. 3 and 5 – western pond (looking northeast).	

Photograph #48 Vertical wetlands for Pond No. 3 and 5 – eastern pond (looking northeast).	
Photograph #49 View of inflow channel to Pond 5 with multiple small liner perforations suspected of being related to wildlife. (looking northwest).	

Stack Out Pad Operations

Photograph #50	
View of FGD stack out pad operations (looking southeast).	
Photograph #51	
View of FGD stack out pad operations (looking southeast).	

RWL- Additional Photos

Photograph #52	
View of CCR placement within the lateral expansion area – Phase H (looking northwest).	
Photograph #53	
View of windrows/stockpiles of the salvaged soil on the slope above the active FGD operations in Phases F2/J (looking west).	

Photograph #54	
View of channel on south side of RWL along access road (looking west).	

APPENDIX B SUMMARY OF QUALITATIVE INSPECTION TERMS

SUMMARY OF QUALITATIVE VISUAL INSPECTION TERMS

The terms described below are used to describe the overall condition and/or appearance of an observed embankment, structure, activity, or item. These terms are intended to give an overall qualitative judgment of the particular item. Please note, some of the terms described below were not used in this year's inspection, but are included as a comparative reference.

Satisfactory: A condition or activity that meets what would be minimally anticipated or expected from a stability, maintenance, or design viewpoint.

Poor: A condition or activity that does not meet what would be minimally anticipated or expected from a stability, maintenance, or design viewport. If a rating of "poor" is assigned, then corrective action is required in as timely a manner as possible.

Minor: A reference to an item or activity where the current maintenance condition is below what is normally desired, but does not cause concern from a stability of safety viewpoint. Generally, these conditions would be identified and could be remedied through the normal maintenance process.

Significant: A reference to an item or activity which would impact the stability or daily operating conditions of the CCR unit. Generally, significant features develop over time and would likely be a result of maintenance not occurring when minor deficiencies were first noted. If left unchecked, such conditions could eventually be a concern for the stability and safety of the CCR unit.

Excessive: A reference to an item or activity that is much worse than what is normal or desired and is of immediate concern to the stability or safety of the CCR unit. Such a condition may also impact the ability of the inspector to properly evaluate the particular item or area.

APPENDIX C PROFESSIONAL ENGINEER CERTIFICATION

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I or an agent under my review has prepared this Annual Inspection Report for the Residual Waste Landfill, and am familiar with the provisions of the final rule to regulate the disposal of coal combustion residuals (CCR). I attest that this report has been prepared in accordance with good engineering practices and meets the intent of 40 CFR 257.84. To the best of my knowledge, the information contained in this Report is true, complete, and accurate.

James A. Hemme, P.E.

Date: January 5, 2024

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