

# 2021 Annual Landfill Inspection Report

**Little Broad Run Landfill**

**Mountaineer Plant  
New Haven, West Virginia**

**August 31, 2021**

**Appalachian Power  
Wheeling, WV**

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**2021 Annual Landfill Inspection Report  
(CCR Landfill)**

**Mountaineer Plant**

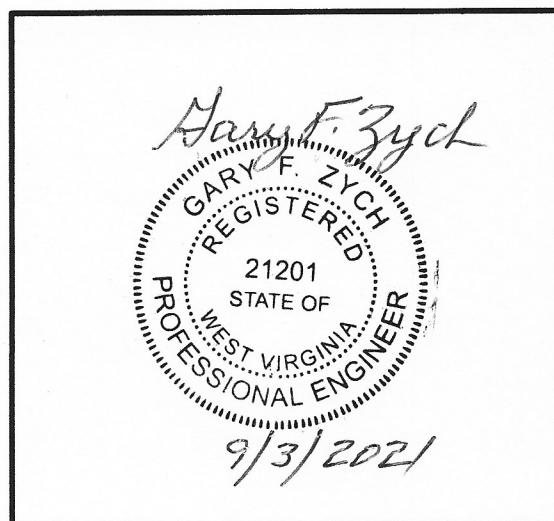
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I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 40 CFR § 257.84(b).

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Figure 3 – Landfill Map

### Attachment B

Figure 3 – Photo Location Map

Inspection Photos

## **1.0 INTRODUCTION**

This report was prepared by AEP- Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of 40 CFR 257.84 and to provide the Mountaineer Plant an evaluation of the facility.

Mr. Brett Dreger, P.E. performed the 2021 inspection of the Landfill at the Mountaineer Plant. This report is a summary of the inspection and an assessment of the general condition of the facility. Mr. Chris Purdum, P.E. of the plant was the facility contact. The inspection was performed on August 6, 2021. Weather conditions were mostly sunny with some clouds and temperature was in the low to mid 80's (°F). There was 0.25 inches of rainfall recorded by the plant over the seven days prior to the inspection. All portions of the landfill had been recently mowed.

## **2.0 DESCRIPTION OF LANDFILL**

The Landfill is permitted for nine disposal areas (Areas 1 through 9) and a vertical expansion that is designed over the existing landfill area of approximately 209 acre. Areas 1-7 of the landfill are filled to the permitted grades. Areas 8 and 9 are permitted but not constructed. The vertical expansion is currently divided into four development phases (Phase 1-4) and could be adjusted in acreages based on the operational needs. Figure 1 illustrates major components of the landfill facility that includes landfill, leachate collection ponds, bottom ash pond complex and gypsum stacker pad. Figure 2 provides general overview of the Landfill and breakdown of areas (1-9) and vertical expansion Phases 1-4. Figures 1 and 2 are included in Attachment A.

The landfill inspection included all the fill areas (1-7) including vertical expansion, storm water management system, leachate collection management system, access roads and ditches, and conveyance channels.

At the time of the landfill inspection, operational activities were performed in the vertical expansion area. The landfill work was performed in accordance with the approved permit. Landfill areas outside of the current active fill area were generally covered with soil cover.

## **3.0 REVIEW OF AVAILABLE INFORMATION (257.84(b) (1)(i))**

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

## **4.0 INSPECTION (257.84(b)(1)(ii))**

### **4.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.84(b)(2)(i))**

No modifications have been made to the geometry of the Landfill since the 2020 annual inspection. The geometry of the landfill has remained essentially unchanged, except for the change in topography of the active disposal area.

## **4.2 VOLUME (257.84(b)(2)(ii))**

The total volume of CCR waste disposed at the landfill as of August 2021 was estimated by Chris Purdum with Mountaineer Plant as 24.88 million cubic yards.

## **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:

Good:	A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.
Fair/ Satisfactory	A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.
Poor:	A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.
Minor:	A reference to an observed item (e.g., erosion, seepage, vegetation, 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, etc.) where the current maintenance program has neglected to improve the condition. Usually conditions that have been identified in the previous inspections, but have not been corrected.
Excessive:	A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is above or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or particular 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 a landfill has developed a problem that could impact the structural integrity of the landfill. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage (Leachate Outbreak)

Leachate outbreak is the uncontrolled release of leachate from the landfill.

2. Displacement of the Embankment  
Displacement of the embankment is large scale movement of part of the landfill. Common signs of displacement are cracks, scraps, 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 all structural elements of the landfill perimeter berms, temporary and final covers, drainage features, open cells, and appurtenances such as chimney drains etc.

Overall, the facility is in satisfactory condition. The landfill is functioning as intended with no signs of potential structural weakness or conditions which are disrupting to the safe operation of the landfill. Inspection photos are included in Attachment B. Additional pictures taken during the inspection can be made available upon request. A site map presenting locations of the inspection observations is included in Attachment B (Figures 3A-3C).

1. Photograph No. 1 illustrates the leachate surge pond as part of the entire bottom ash complex. The leachate water from the landfill after going through the leachate collection pond system is discharged into the leachate surge pond located at the power plant. The two discharge HDPE pipes (8" and 16" in diameter) are located on the west dike of the pond illustrated in the photograph appeared in good functional condition.
2. These two discharge pipes are installed between the leachate collection pond and the wastewater pond. There are numerous cleanouts for the discharge pipes between the wastewater and leachate pond. Typical condition of the cleanout and concrete manhole for protection of the cleanouts are illustrated in Photographs No. 2 & 3. All the cleanouts were accessible inside the manhole and appeared in satisfactory.
3. Typical condition of landfill Areas 6 and 7 is illustrated in Photographs No. 4 through 7. Overall, landfill Areas 6 and 7 appeared in satisfactory and stable condition with adequate vegetative cover. The centerline drainage ditch through Areas 6 and 7 is in satisfactory condition but is sparse on vegetation cover (Photograph No. 6). The perimeter ditches were observed to be in satisfactory and functional condition (Photograph No. 7) with some overgrown vegetation among the rip rap. No standing water was observed in the perimeter ditches.
4. Landfill Area 1 appeared in satisfactory and stable condition (illustrated in Photographs No. 8 and 9). A minor scarp that was repaired last year is showing signs of minor movement (Photograph No. 9).

5. The perimeter ditch around Area 1 is in satisfactory and stable condition (Photograph No. 10).
6. Overall Area 2 slopes appeared in satisfactory and stable condition (Photograph No. 11). The scour area along the left groin ditch near the toe area has been repaired, but it has overgrown vegetation throughout the rip rap protection (Photograph No. 12). The soil cover and vegetation on top of Area 2 are in satisfactory and stable condition (Photograph No. 13).
7. Overall Area 3 appeared in satisfactory and stable condition with good vegetative cover and the perimeter ditches around Area 3 were in satisfactory and functioning condition with no standing water (Photographs No. 14, 15, 17 and 18). The toe drains and sump collection pits recently installed along the bottom of Area 3 slopes appeared to be in satisfactory and functional condition. A picture of the sump structure is shown in Photograph no. 16. There were no signs of seepage or wetness along the outside slope areas.
8. There was a significant erosion rill that was recently repaired with rip rap in Area 4 that appears to be stable and in satisfactory condition with good vegetation growth around the repair area. (Photograph No. 19).
9. Overall Area 4 appeared in satisfactory and stable condition (Photograph No. 18, 20 and 21). The soil cover, vegetation and rip rap drainage channel appeared to be in satisfactory condition.
10. Landfill Area 5 is illustrated in Photograph No. 22. Area 5 and the perimeter access road was in satisfactory and stable condition with controlled vegetation.
11. Photograph No. 23 illustrates the northwest sediment pond. Overall, the pond appeared to be functioning as designed and the dikes were in satisfactory and stable condition. Cattail growth was observed throughout the pond area and needs to be cleared.
12. The outside side slope areas of vertical expansion Phase 1A is illustrated in Photograph No. 24. The perimeter ditches (Photograph No. 25) and access road were in satisfactory and stable condition with controlled vegetation.
13. The outside side slope areas of vertical expansion Phase 1B is illustrated in Photograph No. 26. The slope area and perimeter access road were in satisfactory and stable condition with controlled vegetation.
14. Photograph No. 27 and 28 illustrates Phase 1B of the active landfill which is part of the vertical expansion. This area appeared satisfactory and in compliance with the permit requirements.
15. Photograph No. 29 and 30 illustrates gypsum stacker pad. The radial stacker was in operation at the time of inspection. The stacker pad has some accumulation of gypsum in and around the sump structure which will need continuous maintenance.
16. The plunge pool at the bottom of Area 7 discharge chute was in satisfactory and functioning condition (Photograph No. 31). The pool area and rip rap protection had excessive vegetation and will need to be maintained.
17. Landfill Area 7 sediment pond is illustrated in Photograph No. 32 appeared to be functioning as designed and in satisfactory condition.

18. The leachate collection system of the landfill is collected in a manhole at the east side of the landfill. Photograph No. 33 illustrates interior of the manhole as a collection point for all the leachate pipes. The leachate pipes appeared satisfactory and in compliance with the permit requirements. Photographs No. 34 and 35 illustrates the two leachate ponds. The ponds appeared in satisfactory and functional condition.

#### **4.5 CHANGES THAT EFFECT STABILITY OR OPERATION (257.84(b)(2)(iv))**

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

## **5.0 SUMMARY OF FINDINGS**

### **5.1 GENERAL OBSERVATIONS**

The following general observations were identified during the visual inspection:

- 1) In general, the landfill is functioning as intended and the active cell, inactive cells, closed areas, and storm water ditches are in satisfactory condition. The Plant is performing regular maintenance and inspections as required. Several maintenance items have been noted and are described in Section 5.2.

### **5.2 MAINTENANCE ITEMS**

The following maintenance items were identified during the visual inspection, see site map for locations. Contact GES for specific recommendations regarding repairs:

1. Clear any excessive vegetation from the landfill areas and along the leachate discharge pipes and cleanouts as noted.
2. Reseed the centerline ditch through Areas 6 and 7 and remove the overgrown vegetation from the perimeter ditch on the east side of Area 6.
3. Perform maintenance on the Area 1 outside slope berm scarp area. Regrade and seed as necessary to establish good vegetation.
4. Remove overgrown vegetation from the rip rap along the Area 2 groin ditch near the toe.
5. Clean out the excessive cattail growth from the northwest sediment pond.
6. Remove excess gypsum from the stacker pad sump and sump area and backfill, regrade, and compact low areas of the stacker pad for positive drainage.
7. Clean out the excessive cattail growth from the Area 7 letdown chute plunge pool area.



### **5.3 ITEMS TO MONITOR**

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

1. The interim remediation work at Area 3 of the landfill is complete, but should continue monitoring and inspecting the performance of remedial work and seepage management system until a permanent remediation plan is in place.
2. Monitor poor drainage issues at the gypsum stackout pad to reduce the amount of sediment build up in the sump structure.
3. Monitor the scarp area on the Area 1 outside slope berm until it has been completely stabilized.

### **5.4 DEFICIENCIES (257.84(b)(2)(iii))**

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 is, however, a noted deficiency pertaining to leachate seepage and buildup in Area 3 of the existing landfill. The deficiency related to seepage from the cover soils of Area 3 was identified as part of regular monitoring and inspections on July 9, 2020. An interim seepage control plan for Area 3 was developed that consisted of installing several shallow toe drains and sump structures to intercept the seepage before it could daylight through the toe areas of the cover soils. The sump structures pump the collected seepage to a storage tank that is then emptied back into the landfill leachate collection system. A permanent remediation plan for the seepage build up in Area 3 has been developed and will include a multipoint well system for dewatering and removal of excess leachate and a detailed evaluation of the cap/cover materials to determine the effectiveness of the current cap system.

A deficiency is defined as either:

- 1) Uncontrolled seepage (leachate outbreak),
- 2) Displacement of the embankment,
- 3) Blockage of control features, or
- 4) Erosion, more than minor maintenance.

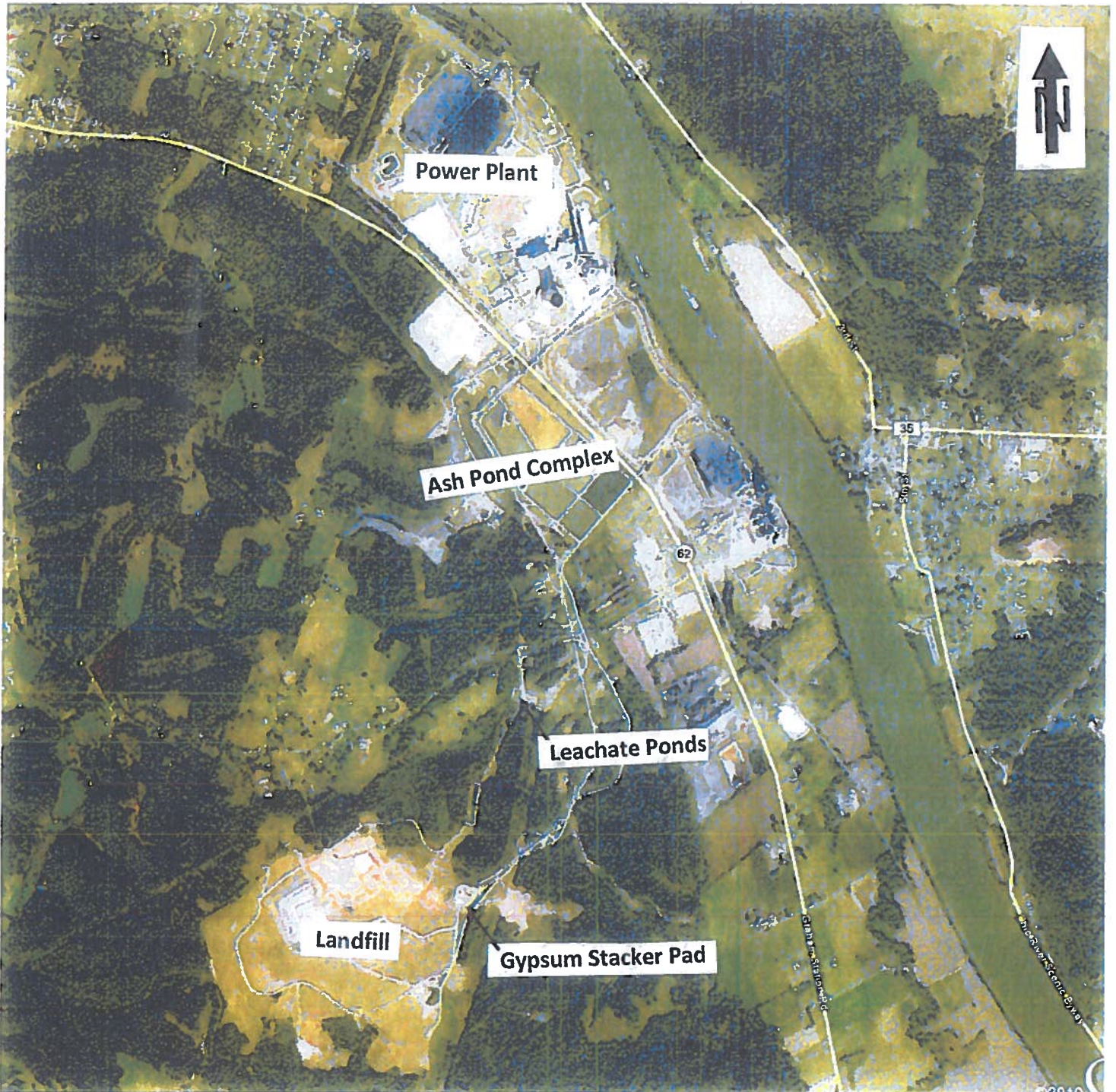
If any of these conditions occur before the next annual inspection contact AEP Geotechnical Engineering immediately.

**ATTACHMENT A**

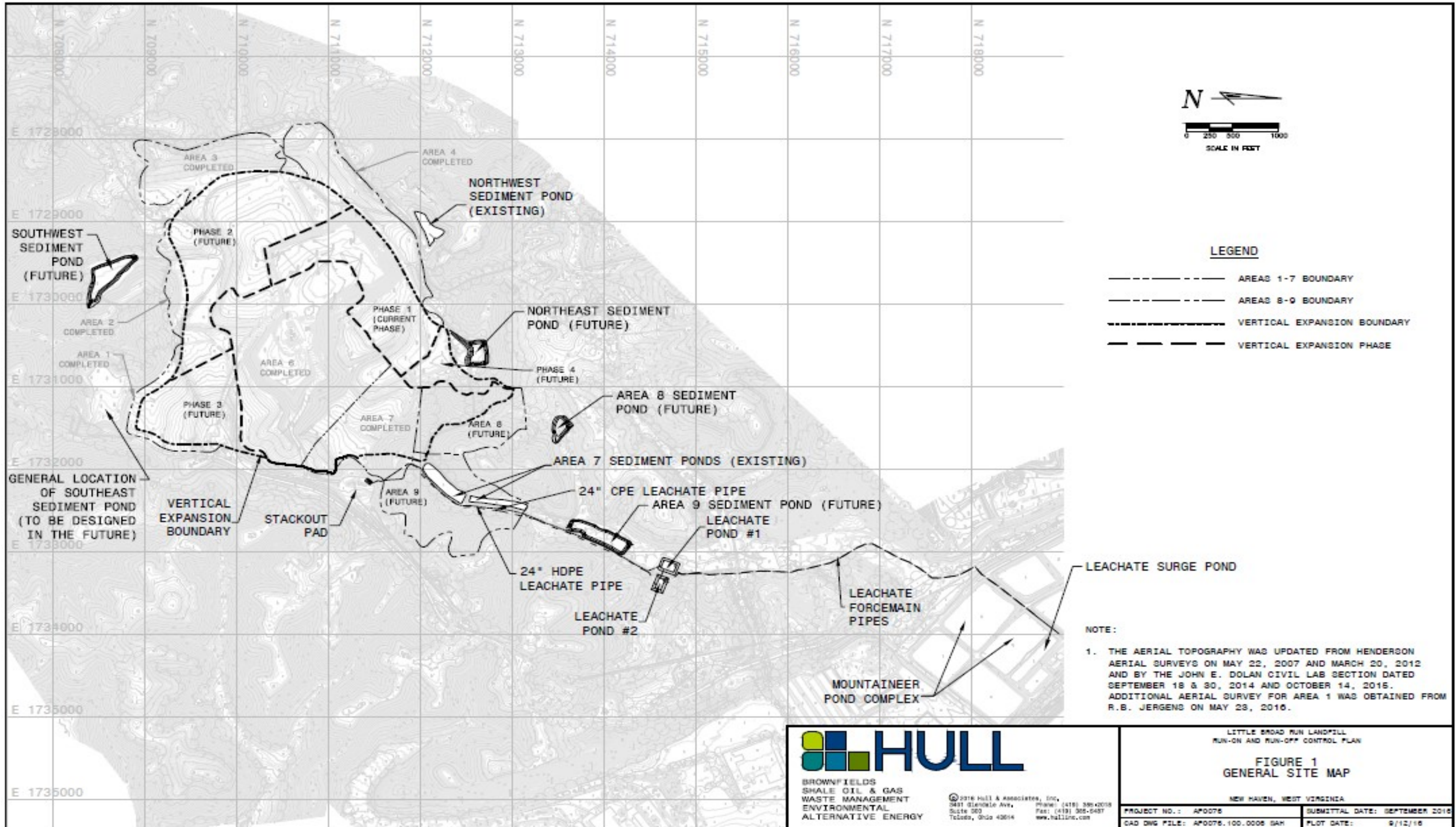
**Figure 1 – Site Location Map**

**Figure 2 – Landfill Map**

**Figure 1 – Site Location Map**  
**Little Broad Run Landfill-Mountaineer Plant**



**Figure 2 – Landfill Map**  
**Little Broad Run Landfill, Mountaineer Plant**



**ATTACHMENT B**

**Figure 3 – Photo Location Map  
Inspection Photos**

Figure 3A – Inspection Photographs Location Map  
Little Broad Run Landfill, Mountaineer Plant



Figure 3B – Inspection Photographs Location Map  
Little Broad Run Landfill, Mountaineer Plant



Figure 3C – Inspection Photographs Location Map  
Little Broad Run Landfill, Mountaineer Plant





Photo # 1

This photograph illustrates landfill leachate surge pond and discharge pipes.



Photo # 2

Typical condition of the cleanout #2 and protective concrete collar.



Photo # 3

Typical condition of the cleanout #6 and protective concrete collar.



Photo # 4

Typical condition of landfill Area 7 vegetative cover and let down chute.



Photo # 5

Typical condition of landfill Areas 6 and 7 vegetative cover.



Photo # 6

View along Areas 6 and 7 cover centerline ditch leading to let down chute in Area 7.



Photo # 7

View along the perimeter ditch of Areas 6 (looking east).



Photo # 8

Overall view of Area 1, top of the landfill.



Photo # 9

Overview of Area 1 side slope cover. Notice repair area of minor scarp in the cover soils.



Photo # 10

Overall view of Area 1 Perimeter Ditch.



Photo # 11

Overview of Area 2 Vegetative Cover.



Photo # 12

Overview of Area 2 Side Slope Groin Ditch Near the Toe. Notice excessive vegetative growth along rip rap.



Photo # 13

Overview of Area 2 Vegetative Cover.



Photo # 14

Overview of Area 3 Vegetative Cover with Rip Rap Toe Area.



Photo # 15

Overview of Area 3 Vegetative Cover.



Photo # 16

Typical View of Area 3 Toe Drain Sump Pit.



Photo # 17

Overview of Area 3 Cover with Solar Panels for Sump Pit Power.



Photo # 18

Overview of Area 3 and 4 Vegetative Cover, Top of Landfill.



Photo # 19

Overview of Area 4 Erosion Rill Repaired with Rip Rap.



Photo # 20

Overview of Area 4 Cover Soils.



Photo # 21

Overview of Area 4 Cover Soils Looking across Northwest Sediment Pond.



Photo # 22

Overview of Area 5 Cover Soils.



Photo # 23

Overview of Northwest Sediment Pond. Notice Overgrown Cattails.



Photo # 24

Overview of Side Slope Area of Vertical Expansion Phase 1A Area.





Photo # 25

Typical Conditions of Perimeter Ditch of Vertical Expansion Areas 1A and 1B.



Photo # 26

Overview of Side Slope Area of Vertical Expansion Phase 1B.



Photo # 27

Active landfill - Vertical Expansion Phase 1B. Looking North.



<p>Photo # 28</p>	
<p>Active landfill - Vertical Expansion Phase 1B. Looking East.</p>	
<p>Photo # 29</p>	
<p>Gypsum Stackout Pad. View of the Storm Water Run Off Sump Structure.</p>	
<p>Photo # 30</p>	
<p>Gypsum Stackout Pad. View of Gypsum Accumulation Near the Sump Structure.</p>	

Photo # 31

Plunge Pool at the Bottom Of Area & Let Down Chute Leading to Area 7 Sediment Pond.



Photo # 32

Overview of Area 7 sediment Pond Interior Conditions.



Photo # 33

Landfill Leachate Pipe Collection Manhole MH-1.



Photo # 34

Leachate Pond 1.



Photo # 35

Leachate Pond 2.

