

2020 Annual Landfill Inspection Report

Little Broad Run Landfill

**Mountaineer Plant
New Haven, West Virginia**

November 23, 2020

**Appalachian Power
Wheeling, WV**

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**2020 Annual Landfill Inspection Report
(CCR Landfill)**

Mountaineer Plant

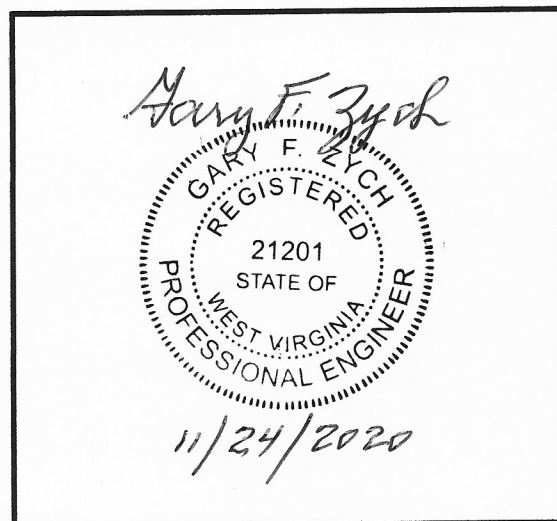
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Date of Inspection: October 28, 2020

PREPARED BY Brett A. Dreger DATE 11/23/2020
Brett Dreger, P.E.

REVIEWED BY Shah Baig DATE 11-23-2020
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APPROVED BY Gary F. Zych DATE 11/24/2020
Gary F. Zych, P.E.
Manager – AEP Geotechnical Engineering



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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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 2020 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 October 28, 2020. Weather conditions were overcast temperature was in the mid 50's (°F). There was 1.35 inches of rainfall recorded by the plant over the seven days prior to the inspection. 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, ash pond complex, gypsum stacker pad, and sediment ponds. 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 (1-9) 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 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 2019 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 October 2020 was estimated by Chris Purdum with Mountaineer Plant as 24.42 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 A.

1. Photograph No. 1 illustrates wastewater 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 wastewater 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 good condition. Minor vegetation along the access to the discharge pipes was present that needs some clearing.
3. Typical condition of landfill Areas 6 and 7 is illustrated in Photograph No. 4 & 5. Overall landfill Areas 6 and 7 appeared in satisfactory and stable condition with adequate vegetative cover. The perimeter ditches were observed to be in satisfactory and functional condition (Photographs No. 6 and 7). 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 is starting to develop on the outside slope berm. This area had just been re-graded and seeded (Photograph No. 9).
5. The perimeter ditch around Area 1 is in fair condition with the exception of an old rock check dam that has silted up and is creating standing water (Photograph No. 10).

6. Overall Area 2 appeared in satisfactory and stable condition (Photograph No. 11). The soil cover and vegetation appeared to be in satisfactory condition. The scour area along the left groin ditch near the toe area has been repaired since last inspection (Photograph No. 12).
7. Overall Area 3 appeared in satisfactory and stable condition with good vegetative cover. The slope remediation work for Area 3 is complete (Photograph No. 13). The remediation work consisted of removing unstable fill, placing a layer of geo-grid, place backfill, a drainage layer using geo-composite, and cover soil. The perimeter ditch around Area 3 on the east side is in good and functioning condition with a few low spots with standing water (Photograph No. 14).
8. There are some minor erosion rills in the new cover of Area 3 that need to be graded and seeded (Photograph No. 15). The perimeter ditch around the west side of Area 3 has some standing water caused by blockage from tire ruts from recent mowing activities (Photograph No. 16).
9. Overall Area 4 appeared in satisfactory and stable condition (Photograph No. 17 and 18). The soil cover, vegetation and rip rap drainage channel appeared to be in satisfactory condition.
10. Landfill Area 5 is illustrated in Photograph No. 19. This area and the perimeter access road was in satisfactory and stable condition with controlled vegetation.
11. Photograph No. 20 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 needs to be cleared.
12. The outside side slope areas of vertical expansion Phase 1A is illustrated in Photograph No. 21. The slope area and perimeter 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. 22. The slope area and perimeter access road were in satisfactory and stable condition with controlled vegetation.
14. Photograph No. 23 and 24 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. 25 and 26 illustrates gypsum stacker pad. The radial stacker was not in operation at the time of inspection. The stacker pad has some accumulation of gypsum near the sump structure (Photograph No. 26).
16. Landfill Area 7 sediment pond is illustrated in Photograph No. 27 appeared to be functioning as designed and in satisfactory condition.
17. The leachate collection system of the landfill is collected in a manhole at the east side of the landfill. Photograph No. 28 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. 29 and 30 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 excessive vegetation from the landfill area and along the leachate discharge pipes and cleanouts as noted.
2. Clean out and grade the perimeter ditch of Area 1 for positive drainage where the rock check dam is silted in.
3. Clean out and grade the eastern perimeter ditch of Area 3 for positive drainage where there is standing water.
4. Perform repair and grading of erosion rills in the cover soils of Area 3 along the eastern end.
5. Clean out and grade the western perimeter ditch of Area 3 for positive drainage where there is standing water caused by tire ruts.
6. Clean out the excessive cattail growth from the northwest sediment pond.
7. Backfill, regrade, and compact low areas of the stacker pad and remove any excessive gypsum for positive drainage.

5.3 ITEMS TO MONITOR

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

1. After completing the interim remediation at Area 3 of the landfill, continue monitoring and inspecting the performance of remedial work and seepage management. Investigate to determine the root cause of the existing seepage in Area 3 and develop a permanent remediation plan for Area 3.

- determine the root cause of the existing seepage in Area 3 and develop a permanent remediation plan for Area 3.
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 developing on the Area 1 outside slope berm. This area should be closely monitored for additional movement until a full repair can be completed.

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 current study is being performed to develop permanent remediation plan for the seepage build up in Area 3.

Additionally, the Remedy of Deficiency documentation for two previous deficiencies were added to the Operating Record on August 17 and 18, 2020.

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 – Sit Location Map

Figure 2 – Landfill Map

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

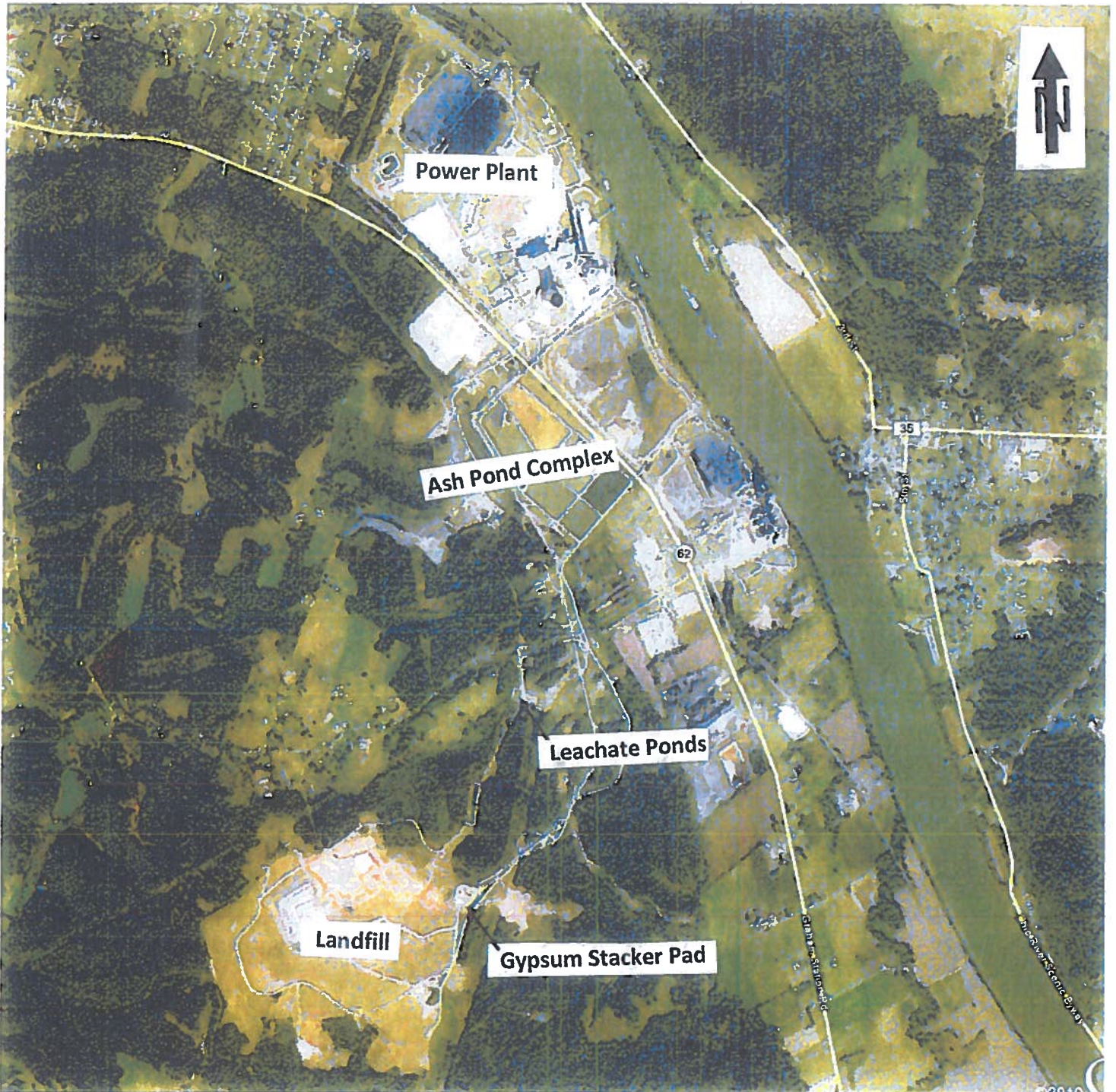
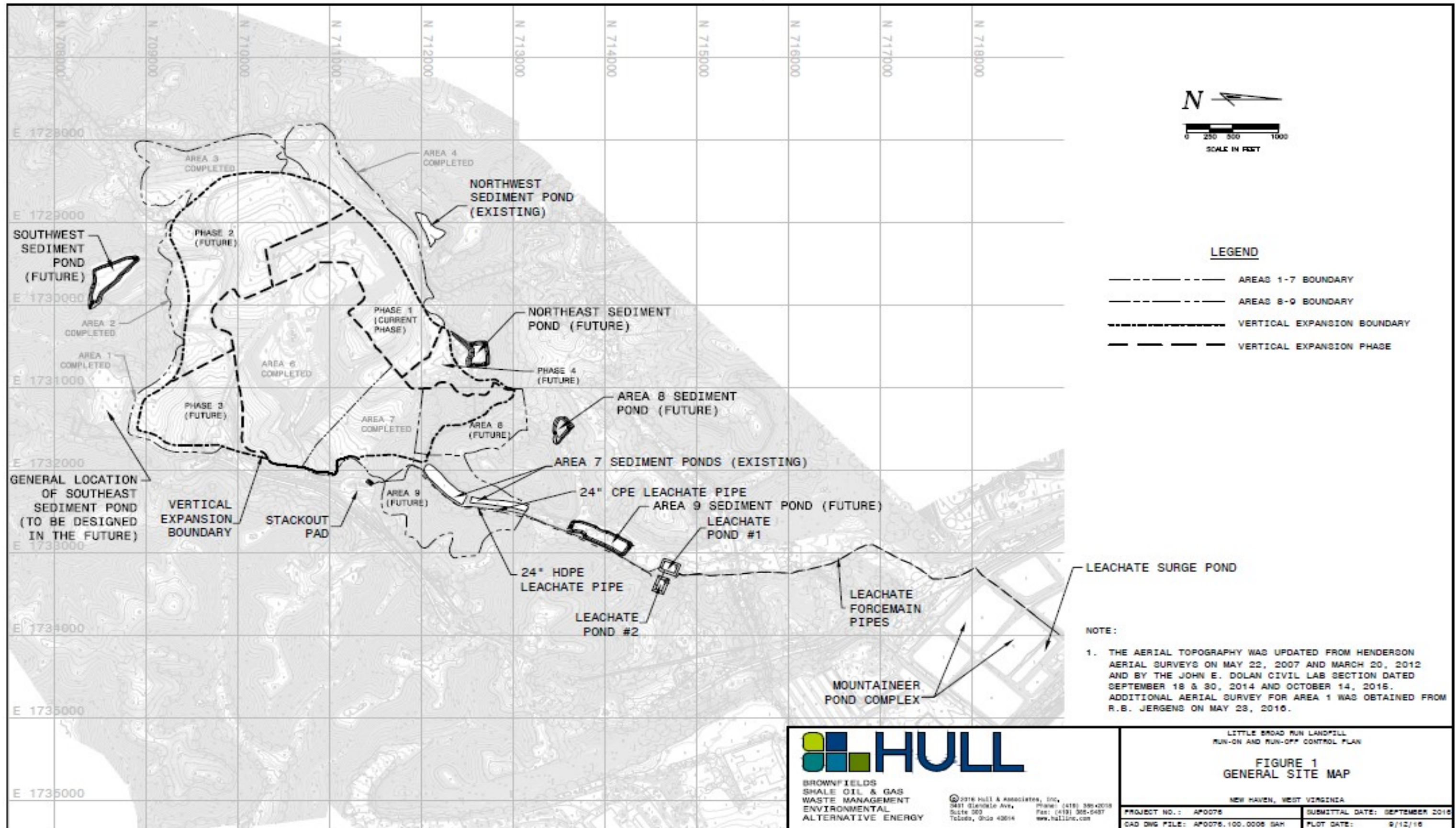


Figure 2 – Landfill Map
Little Broad Run Landfill, Mountaineer Plant



LEGEND

- AREAS 1-7 BOUNDARY
- AREAS 8-9 BOUNDARY
- VERTICAL EXPANSION BOUNDARY
- VERTICAL EXPANSION PHASE

NOTE:

1. THE AERIAL TOPOGRAPHY WAS UPDATED FROM HENDERSON AERIAL SURVEYS ON MAY 22, 2007 AND MARCH 20, 2012 AND BY THE JOHN E. DOLAN CIVIL LAB SECTION DATED SEPTEMBER 18 & 30, 2014 AND OCTOBER 14, 2015. ADDITIONAL AERIAL SURVEY FOR AREA 1 WAS OBTAINED FROM R.B. JERGENS ON MAY 28, 2016.



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LITTLE BROAD RUN LANDFILL
 RUN-ON AND RUN-OFF CONTROL PLAN

**FIGURE 1
 GENERAL SITE MAP**

NEW HAVEN, WEST VIRGINIA

PROJECT NO.: APO076	SUBMITTAL DATE: SEPTEMBER 2016
DWG FILE: APO076.100.0008.dwg	PLOT DATE: 9/12/16

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 #5 and protective concrete collar.



Photo # 4

Typical condition of landfill Area 7 vegetative cover.



Photo # 5

Typical condition of landfill Areas 6 and 7 vegetative cover.



Photo # 6

View along the perimeter ditch of Areas 6 and 7 (looking northeast).



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 minor scarp in the cover soils.



Photo # 10

Overall view of Area 1 Perimeter Ditch Silted In.



Photo # 11

Overview of Area 2 Vegetative Cover.



Photo # 12

Overview of Area 2 Side Slope Groin Ditch Near the Toe. Scour Along the Groin Ditch Has been Stabilized With Rip Rap.



Photo # 13

Overview of Area 3 Vegetative Cover Looking West.



Photo # 14

Overview of Area 3 Perimeter Ditch.



Photo # 15

Overview of Area 3 Vegetative Cover with Erosion Rills.



Photo # 16

Overview of Area 3 Perimeter Ditch Blockage Caused By Tire Ruts.



Photo # 17

Overview of Area 4 Cover and Northwest Sediment Pond in the Background.



Photo # 18

Overview of Area 4 Cover.



Photo # 19

Overview of Area 5 Vegetative Cover, Top of Landfill.



Photo # 20

Overview of Northwest Sediment Pond.



Photo # 21

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



Photo # 22

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



Photo # 23

Active landfill – Vertical Expansion Phase 1B. Looking Northwest.



Photo # 24

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



Photo # 25

Gypsum Stackout Pad. View of the Storm Water Run Off Sump Structure.



Photo # 26

Gypsum Stackout Pad. View of Gypsum Accumulation Near the Sump Structure.

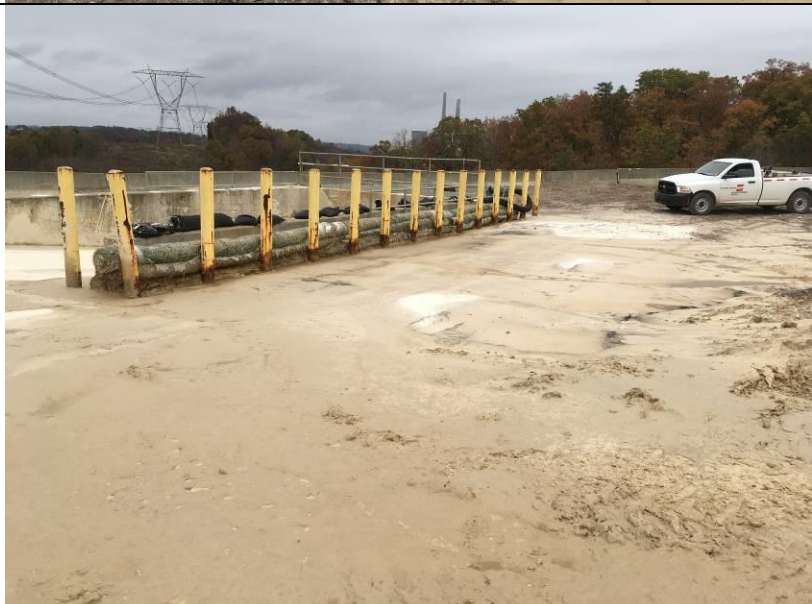


Photo # 27

Overview of Area 7 Sediment Pond.



Photo # 28

Landfill Leachate Pipe Collection
Manhole MH-1.



Photo # 29

Leachate Pond 1.



Photo # 30

Leachate Pond 2.

