2021 Annual Dam and Dike Inspection Report

Bottom Ash Pond Complex

Mitchell Plant

Wheeling Power Company & Kentucky Power Company

Marshall County, West Virginia

August 2021

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

AMERICAN ELECTRIC POWER
BOUNDLESS ENERGY℠

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ENGINEER'S INSPECTION VERIFICATION STATEMENT

For Compliance with Dam Safety Rules §47-34-15.4.c

I hereby verify that I supervised the visual inspection of the Mitchell Bottom Ash Complex (ID# 05108) and its appurtenances on July 28, 2021. The attached signed and sealed inspection report documents:

1) the current conditions as observed;

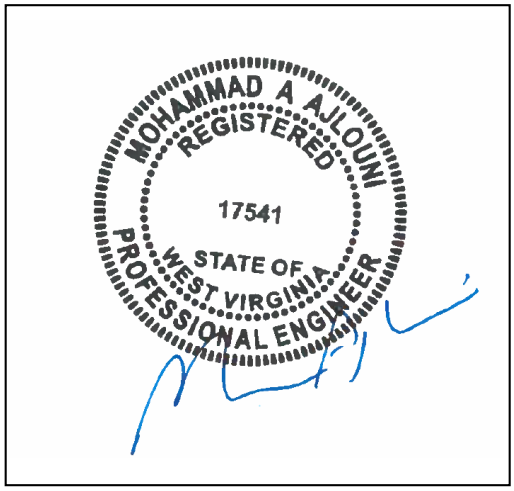
2) any maintenance items necessary to prolong safe functioning of the dam;

3) any conditions observed during the inspection which indicate that the dam has a serious problem[(1)];

4) any conditions that will not allow proper functioning of the dam during normal or maximum reservoir water level conditions.

Signature
Mohammad A. Ajlouni, P.E., Ph.D.
Engineer Principal
Geotechnical Engineering Services
American Electric Power Service Corporation

8/20/2021
Date



SEAL

(1) As defined in Section 2.47 of the Dam Safety Rules

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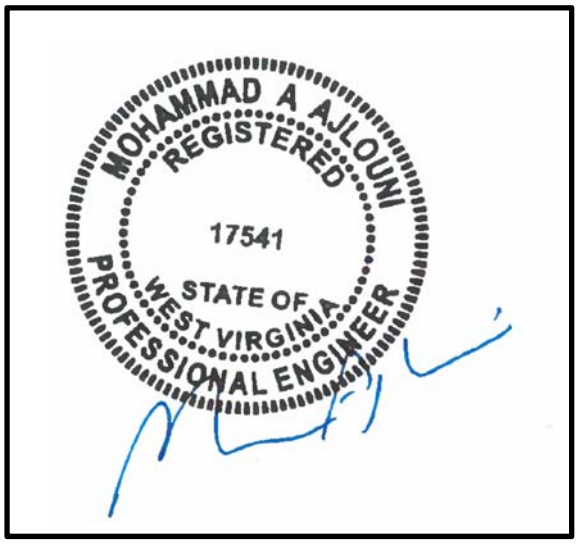
PREPARED BY _____ DATE 08/20/2021
Mohammad A. Ajlouni, Ph.D.,P.E.

REVIEWED BY Brett A. Dreger DATE 08/27/2021
Brett A. Dreger, PE

APPROVED BY Gary F. Zych DATE 8/27/2021
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 § 257.83(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 257.83 for the CCR impoundments and to provide the Mitchell Plant an evaluation of the entire Bottom Ash Complex.

The 2021Annual Dike and Dam Inspection at the Mitchell Plant's Bottom Ash Complex was conducted on July 28, 2021. Mohammad Ajlouni, of AEPSC Civil Engineering & Geotechnical Services conducted the inspection and was accompanied by Danielle R Roski and Mr. Dennis Henderson of the Mitchell Plant. This report is a summary of the inspection and an assessment of the general condition of the facility. Weather conditions were sunny and the temperature was in the mid 80°'s F. There were 0 inches of rainfall over the seven days prior to the inspection. The embankments were not recently mowed due to the malfunction of the plant mower.

2.0 DESCRIPTION OF IMPOUNDMENTS

The Bottom Ash Complex is comprised of the Bottom Ash Pond (BAP) and the Clear Water Pond as shown on Figure 1 –Inspection and Instrumentation Map. Within the Bottom Ash Complex, the BAP is positioned immediately north of the Clear Water Pond and the south dike of the BAP separates the two ponds. The BAP outlet structure, located in the southwest quadrant of the pond, is hydraulically connected to the Clear Water Pond. The BAP is an active CCR surface impoundment. The Clear Water Pond is not considered part of the Mitchell BAP CCR Unit.

The Mitchell BAP was constructed utilizing dikes comprised of compacted local sandy soils for the north, west and south perimeters and is partially incised into a natural hillside along the east side. The interior slopes of the BAP are lined with a polyvinyl chloride (PVC) liner which is overlain by 3 feet of composite soils. The exterior and interior pond/dike slopes are vegetated (above the pool level on the interior slopes) to minimize erosion.

The Mitchell BAP is divided into two primary areas for progressive settlement of the bottom ash that is sluiced into the CCR unit. Initially, the bottom ash is sluiced into the northeast corner of the eastern half of the pond for initial settling and primary excavation of the decanted material. The sluice water then flows toward the south end of the eastern half of the pond before flowing into the western half of the pond. A culvert pipe allows the sluice water to transition into the west half of the pond. The working bottom of the south half of the Mitchell BAP east side is above the normal operating pool level to allow excavation and load-out operations of the bottom ash collected within the eastern portion of the pond. The western half of the pond is separated from the east half by an interior "splitter" dike and is divided into four (4) individual containment areas separated by internal dikes that direct the flow of water into the containment areas and increase the retention time in order to promote further settling of the bottom ash. After the sluice water proceeds through the west half of the pond, the water is then released from the BAP through a 30-inch diameter reinforced concrete outlet pipe located at the southwest corner of the pond to the Clear Water Pond. Flow from the Clear Water Pond is discharged through principal outlet structure to the Ohio River through an outlet pipe consisting of 36" RCP and CMP pipe. The normal pool elevation in the west half of the pond is maintained at approximate elevation 676 feet above mean sea level (msl).

3.0 REVIEW OF AVAILABLE INFORMATION (257.83(b)(1)(i))

A review of available information regarding the status and condition of the Bottom Ash Complex which include files available in the operating record, such as design and construction information, previous periodic structural stability assessments, previous 7 day inspection reports, and previous annual inspections has been conducted. Based on the review of the data there were no signs of actual or potential structural weakness or adverse conditions noted.

4.0 INSPECTION (257.83(b)(1)(ii))

4.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.83(b)(2)(i))

No modifications have been made to the geometry of the Bottom Ash Pond or Bottom Ash Pond Complex since the 2020 annual inspection. The geometry of the impoundments has remained essentially unchanged.

4.2 INSTRUMENTATION (257.83(b)(2)(ii))

There are four stand pipe piezometers installed around the bottom ash pond as shown on Figure 1. Regular readings are recorded for each piezometer at a minimum 30 day interval. All piezometer readings exhibited minor fluctuations and were at safe levels. Table 1 describes the maximum reading of each piezometer since the last inspection.

Table 1 Maximum recorded instruments reading since the previous annual inspection

INSTRUMENTATION DATA **Bottom Ash Pond**			
Instrument	**Type**	**Maximum Reading since last annual inspection**	**Date of reading**
B-2	Piezometer	659.96	01/13/2021
B-3	Piezometer	667.91	03/10/2021
B-4	Piezometer	665.83	03/10/2021
B-5	Piezometer	666.83	05/05/2021

Figure 2 presents the pond water levels as well as the piezometers water levels and rain fall record. Changes in piezometers levels correlate to the bottom ash pond level and to the rain fall intensity except for B-2 located to the north of the pond complex which appears to be dry.

4.3 IMPOUNDMENT CHARACTERISTICS (257.83(b)(2)(iii, iv, v))

Table 2 is a summary of the minimum, maximum, and present depth and elevation of the impounded water & CCR since the previous annual inspection; the storage capacity of the impounding structure at the time of the inspection; and the approximate volume of the impounded water and CCR at the time of the inspection.

Table 2 Summary of Relevant Storage Information

IMPOUNDMENT CHARACTERISTICS	
	Bottom Ash Pond
Approximate **Minimum** depth (elevation) of impounded water since last annual inspection	8.21ft. (676.42 ft msl)
Approximate **Maximum** depth (elevation) of impounded water since last annual inspection	9.51ft. (677.72 ft msl)
Approximate **Present** depth of impounded water at the time of the inspection	9.33 ft. (677.54 ft msl)

Approximate **Minimum** depth (elevation) of CCR since last annual inspection	<10 ft. (670.0 ft msl)
Approximate **Maximum** depth (elevation) of CCR since last annual inspection	>30 ft.(690 ft msl)
Approximate **Present** depth (elevation) of CCR at the time of the inspection	30 ft. (690 ft msl)
Approximate Storage Capacity of impounding structure at the time of the inspection	145,700 C.Y.
Approximate volume of impounded water at the time of the inspection	55,400 C.Y.
Approximate volume of CCR at the time of the inspection	130,400 C.Y.

4.4 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 §257.83(b)(5) Inspection Requirements for CCR Surface Impoundments. This definition has been assembled using the CCR rule preamble as well as guidance from MSHA, "Qualifications for Impoundment Inspection" CI-31,

2004. These guidance documents further elaborate on the definition of deficiency. Items not defined by deficiency are considered maintenance or items to be monitored.

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

1. Uncontrolled Seepage

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

   Note: Wet or soft areas are not considered as uncontrolled seepage, but can lead to this type of deficiency. These areas should be monitored more frequently.
2. Displacement of the Embankment

   Displacement of the embankment is large scale movement of part of the dam. Common signs of displacement are cracks, scarps, bulges, depressions, sinkholes and slides.
3. Blockage of Control Features

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

   Erosion is the gradual movement of surface material by water, wind or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

4.5 VISUAL INSPECTION (257.83(b)(2)(i))

A visual inspection of the Bottom Ash Pond Complex including the BAP and Clear Water Pond was conducted to identify any signs of distress or malfunction of the impoundment and appurtenant structures. Specific items inspected included all structural elements of the dam such as inboard and outboard slopes, crest, and toe; as well as appurtenances.

Overall the facility is in good condition. The impoundment is functioning as intended with no signs of potential structural weakness or conditions which are disrupting to the safe operation of the impoundment. Inspection photos are included in Attachment A. Additional pictures taken during the inspection can be made available upon request. A map presenting locations of the inspection observations is included Figure 1.

Bottom Ash Pond

1. The Bottom Ash Pond was in service at the time of the inspection. Plant inflows were entering the pond along the north side. The plant inflow entry points were in good condition with no signs of erosion. The timber support structures for the sluice lines were in good condition. The sluice lines were in good condition. The pool was at 677.54 which is around its normal operating level.
2. The east portion of the pond is used for dewatering and removal of sluiced bottom ash. The dewatering activities were not observed to impact the structure or stability of the dam and the impounding area of the pond appeared in good condition.

3. The interior slopes showed no signs of distress such as sloughing, bulges or erosion. The slopes were not mowed before the inspection as a result of mower malfunction (Observation 1). The rip rap protection along the west and south slope was stable with remnants of sprayed vegetation.
4. The exterior slopes were not mowed before the inspection as a result of mower malfunction. No signs of instability were observed. In general the vegetation were slightly overgrown. There were areas along the west dike where vegetation was sparse (Observation 2).
5. The spillway structure was observed to be functioning properly. The concrete was in good condition and stop logs were available.
6. There were no seepage or wet areas observed along the embankment.

Clear Water Pond

1. The Clear Water Pond was good operating condition during the time of the inspection. Inflows from the BAP enter the pond below the normal pool however the flow appeared to be unobstructed.
2. The interior slopes showed no signs of distress such as sloughing or bulges. The grass was not mowed before the inspection as a result of mower malfunction. Two animal burrows were observed during this inspection along the north and east interior dikes (Observation 3).
3. The splitter dike separating the Clear Water Pond and BAP appeared to be in good condition and showed no signs of distress.
4. The outboard slope of the Clear Water Pond was in good condition. There were no signs of movement or misalignment, sloughing or bulges.
5. There were no seepage or wet areas observed along the embankment.
6. The access road located at the crest of the pond appeared in good and stable condition with no signs of distress such as settlement or ruts.
7. The visible portions of the concrete discharge structure were in good condition and function properly. The concrete and metal stair structures were in good condition. There was a stop log structure present. There was a sediment curtain and boom installed just upstream and it appeared to be in good condition.

4.6 CHANGES THAT EFFECT STABILITY OR OPERATION (257.83(b)(2)(vii))

Based on interviews with plant personnel and field observations there were no changes to the Bottom Ash Pond, as well as the entire Bottom Ash Pond Complex since the last annual inspection that would affect the stability of the impounding structure.

5.0 SUMMARY OF FINDINGS

5.1 GENERAL OBSERVATIONS

The following general observations were identified during the visual inspection:

1) The outboard slopes, crest and inboard slopes and splitter dike of the impoundments were generally in good condition. The embankments did not show any signs of structural weakness or instability. The vegetation along the embankments was not recently mowed in most locations due to mower malfunction. The crest did not contain any ruts, cracks, depressions or other signs of instability. Specific maintenance and items to monitor are described in the subsequent sections of this report.

5.2 MAINTENANCE ITEMS

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

1) Continue the routine mowing operation. (Observation 1)

2) Seed and mulch areas on the outboard slope of the Bottom Ash Pond by replacement of soil and re-seed. (Observation 2)

3) Repair animal burrows along the north and east interior dikes of the clear water pond (Observation 3).

5.3 ITEMS TO MONITOR

The following items were identified during the visual inspection as items to be monitored, see inspection map for locations:

1) None

5.4 DEFICIENCIES (257.83(b)(2)(vi))

The Bottom Ash Pond Complex, consisting of the Bottom Ash Pond and Clear Water Pond, exhibited no signs of structural weakness or disruptive conditions during the inspection that would require additional investigation or remedial action. There were no deficiencies noted during this inspection or during any of the periodic 7-day or 30-day inspections. A deficiency is defined as either 1) uncontrolled seepage, 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.

FIGURES

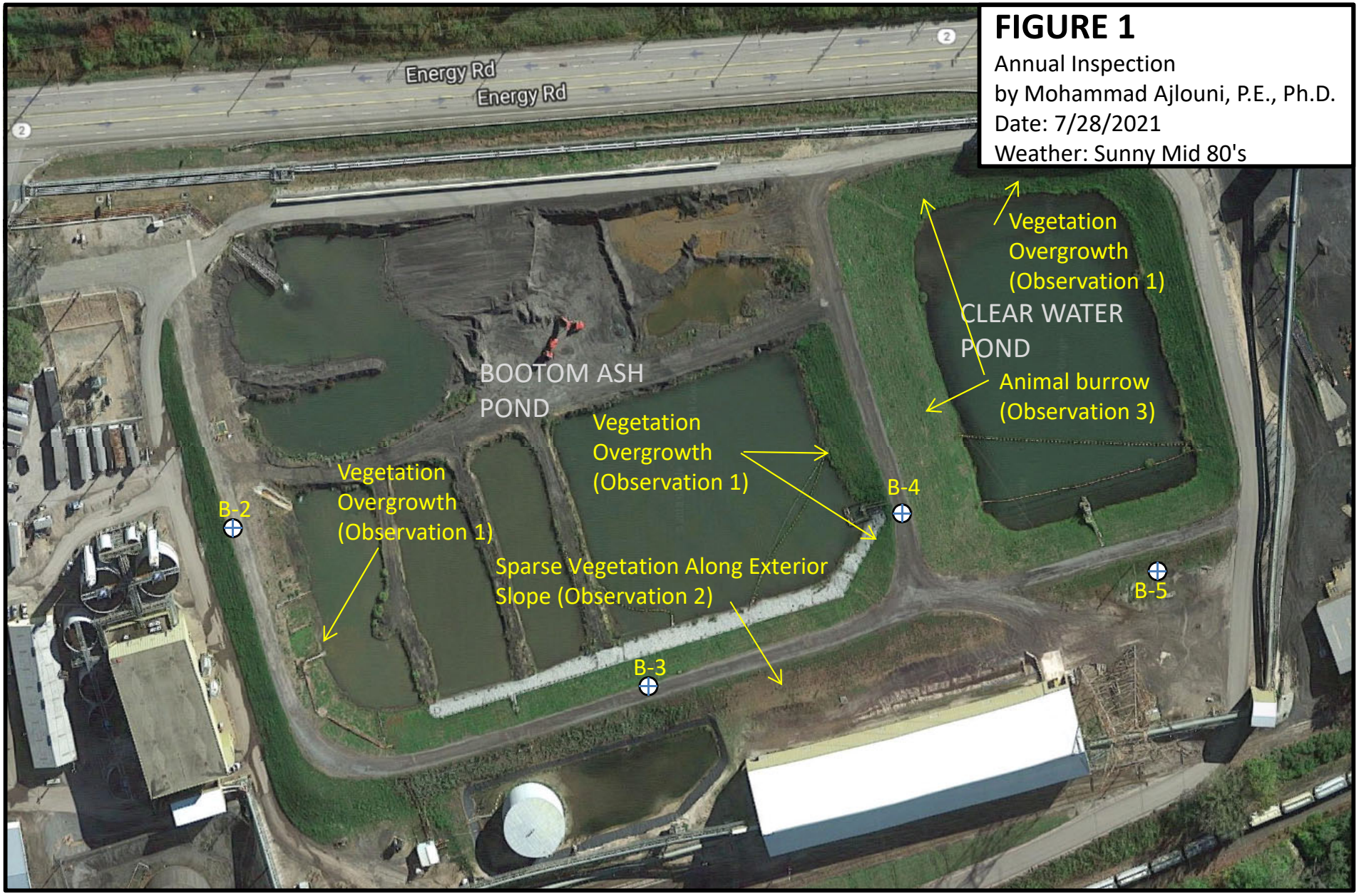

FIGURE 1

Annual Inspection
by Mohammad Ajlouni, P.E., Ph.D.
Date: 7/28/2021
Weather: Sunny Mid 80's

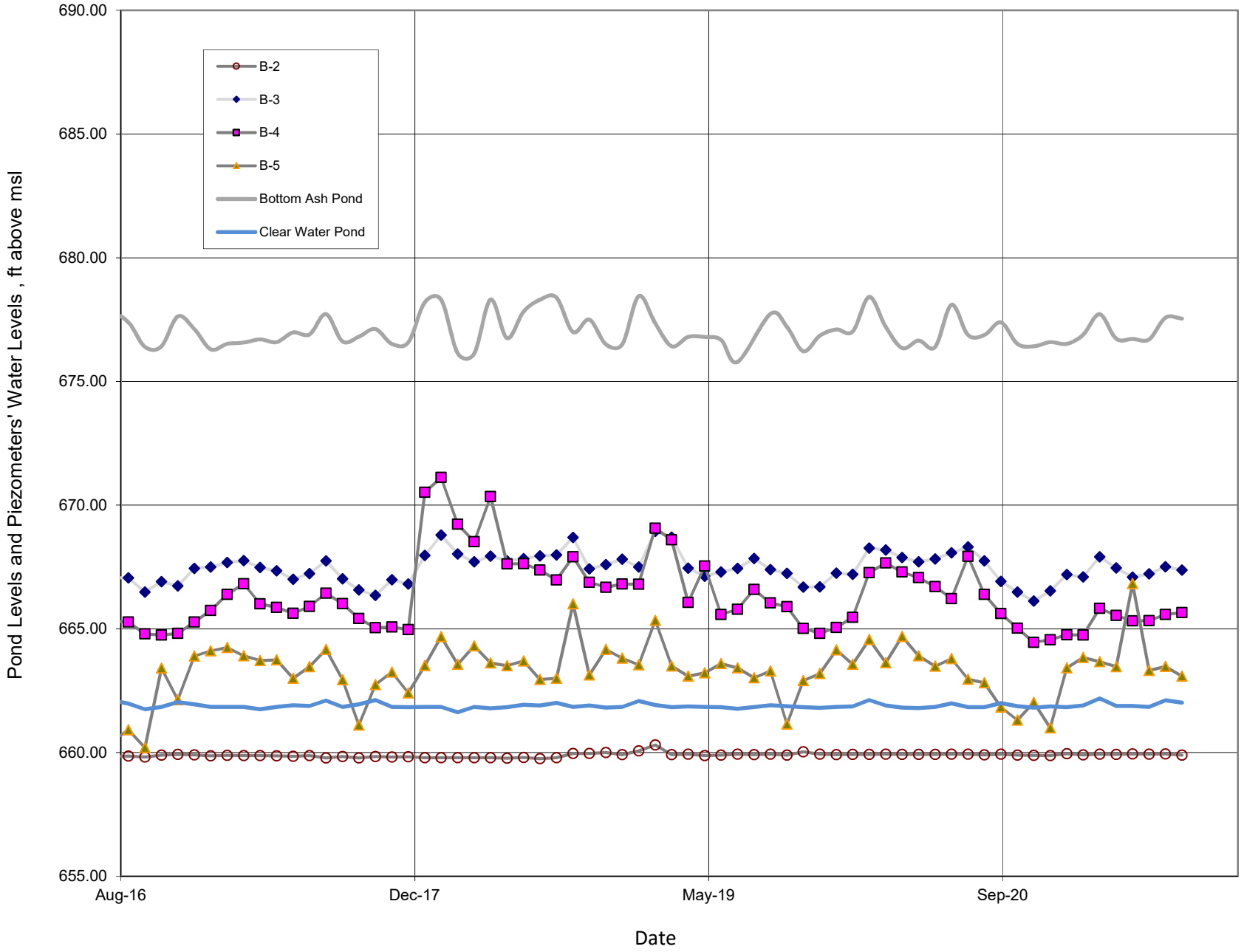

Figure 2 Bottom Ash Pond Complex Piezometers' & Ponds Level

ATTACHMENT A

Photos

2021 INSPECTION PHOTOS
BOTTOM ASH POND COMPLEX
MITCHELL PLANT

	**Photo No. 1** Observation 1: Minor Overgrown Vegetation Location: North inboard slope of Bottom Ash Pond Recommendations: Repair by mowing.
	**Photo No. 2** Observation 1: Minor Overgrown Vegetation Location: South inboard slope of Bottom Ash Pond **Recommendations: Repair by Weed eaters or spray**
	**Photo No. 3** Observation 2: Sparse Vegetation Location: West outboard slope of Clear Water Pond Recommendations: Repair by Seed & Mulch.

2021 INSPECTION PHOTOS
BOTTOM ASH POND COMPLEX
MITCHELL PLANT

	**Photo No. 4** Observation 3: Burrow Hole. Location: North inboard slope of Clear Water Pond Recommendations: Repair by fill in with soil.
	**Photo No. 5** Observation 3: Burrow Hole Location: East inboard slope of Clear Water Pond Recommendations: Repair by fill in with soil.