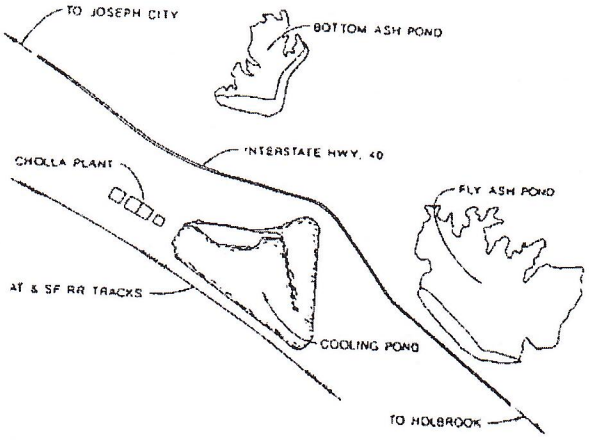
CHOLLA POWER PLANT
Fly Ash Dam, Bottom Ash Dam, and Bottom Ash Monofill

Annual CCR Impoundment and Landfill Inspection Report

2022



GENERATION ENGINEERING
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CERTIFICATE NO.
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LEE WRIGHT
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ARIZONA U.S.A.

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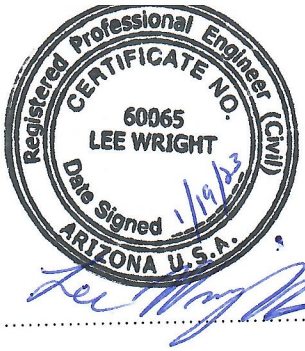

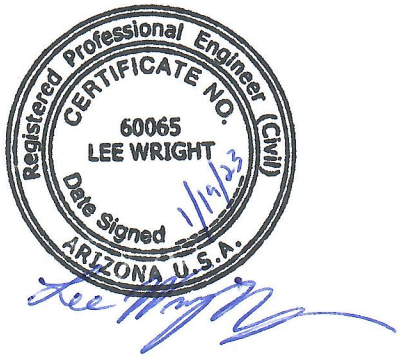

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1.0 INTRODUCTION

Arizona Public Service Company (APS) prepared this report to comply with the Environmental Protection Agency's (EPA) Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule (2015) requiring "*...inspections by a qualified professional engineer at intervals not exceeding one year to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards*" (40 CFR 257.83(b)(1) for CCR surface impoundments and 40 CFR 257.84(b)(1) for CCR landfills). AECOM staff participated in the CCR unit inspection and provided technical support in the preparation of this document.

This report includes a review of relevant data in the operating record and visual inspections of the Fly Ash Dam, Bottom Ash Dam, and the Bottom Ash Monofill. The Fly Ash Dam and Bottom Ash Dam are instrumented with piezometers, settlement monuments, seepage totalizers, and wells.

Inspection Conducted by

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APS Generation, Fossil Projects Coal
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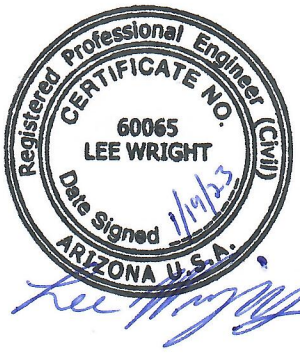

2.0 SITE BACKGROUND AND INSPECTION CONDITIONS

The Cholla Power Plant (Cholla, the Plant) is located nine miles west of Holbrook, Arizona. The Plant is located in the north half of Section 23, Township 18 North, Range 19 East in Navajo County, adjacent to and north of the Little Colorado River. The Plant site and off-site facilities comprise portions of Sections 22 through 27 in Township 18 North, Range 19 East and Section 30 in Township 18 North, Range 20 East. The Plant began operation of Unit 1 at the site in 1961 and Units 2, 3, and 4 were constructed between 1976 and 1981. Unit 2 was removed from service on October 1, 2015. Unit 4 was removed from service on December 28, 2020. The two remaining operational units (Units 1 and 3) currently burn sub-bituminous coal to provide a total net generating capacity of 387 megawatts (MW). Units 1 and 3 are operated based on load and economic factors.

The coal combustion process produces Coal Combustion Residuals (CCR) including bottom ash (silty sand, Unified Soil Classification System SM), fly ash (low plasticity silt, Unified Soil Classification System ML), and Flue Gas Desulfurization (FGD) sludge. The Plant has three active CCR units: the Bottom Ash Pond, the Fly Ash Pond, and the Bottom Ash Monofill. A fourth CCR unit, the Sedimentation Pond, was closed in 2021 in accordance with 40 CFR 257.102(c) (closure by removal of CCR). The Bottom Ash Pond and the Fly Ash Pond are used for CCR disposal. The Bottom Ash Monofill is a coal combustion waste landfill used for long-term storage and disposal of dewatered bottom ash transferred from the Bottom Ash Pond. The three active CCR units are the subjects of this inspection report.

The field inspection was conducted on Monday, October 17, 2022 and Tuesday, October 18, 2022. Weather conditions were mild (46-64 degrees Fahrenheit) with light winds (2-10 mph with gusts to 15 mph); it was mostly cloudy on Monday and the sky was clear on Tuesday. Approximately 10.10 inches of precipitation had fallen between October 1, 2021 and September 30, 2022 based on data recorded near Holbrook, Arizona. An additional 1.58 inches of precipitation had fallen between October 1, 2022 and October 16, 2022, including a total of 0.74 inches on October 15 and October 16 (Weather Underground 2022). Units 1 and 3 were running at the time of the inspection.

Instrumentation at the dams consists of open standpipe PVC piezometers, open well points, weirs, flow meters with totalizers, and brass survey caps on a concrete base measured using a Global Positioning System (GPS) survey. The water level in the piezometers is measured with an electronic water level indicator attached to a cable stamped with increments of 0.01 feet. The impounded water level in the Bottom Ash Pond is measured by an elevation indicator based on NGVD29 set at the edge of the water. The impounded water level in the Fly Ash Pond is measured on a monthly basis using GPS equipment.

The benchmark for the elevations reported for GPS surveys of the settlement monuments at the Cholla Power Plant is based on the Randell 2 monument located on the north side of the Joseph City I-40 overpass. Detailed information of Randell 2 can be found on the National Geodetic Survey (NGS) website. The latitude and longitude of the monument are based on the NAD83 datum. The NGS (2022) lists the elevation of the monument as 5088.09 feet (NAVD88).

3.0 UNIT DESCRIPTIONS

3.1 FLY ASH DAM

The Fly Ash Dam is represented on Figure 1 – Fly Ash Pond Site Map (attached).

The Fly Ash Dam (listed by the Arizona Department of Water Resources (ADWR) as Dam #09.28) was constructed between 1976 and 1978, has a capacity of 18,000 acre-feet, is approximately 80 feet high with an approximately 4,583-foot long clay core zoned earth embankment, and has a Federal Emergency Management Agency (FEMA) rating of intermediate size and high hazard. The maximum normal operating water level is elevation (EL) 5114.0 feet. The water level was measured most recently by survey to be at EL 5083.243 feet on October 13, 2022. The original water level gauge has been abandoned. The gauge was first covered with sediment in early 2015. By the time the reservoir level had receded below the maximum elevation on the water level gauge in early 2016, the gauge had been covered with a thick layer of sediment and evaporite crystals, making it unusable.

3.2 BOTTOM ASH DAM

The Bottom Ash Dam is represented on Figure 2 – Bottom Ash Pond Site Map (attached).

The Bottom Ash Dam (ADWR Dam #09.27) was constructed between 1976 and 1978, has a capacity of 2,300 acre-feet, is approximately 73 feet high with an approximately 4,040-foot long clay core zoned earth embankment, and has a FEMA rating of intermediate size and high hazard. The maximum operating water level is EL 5117.8 feet. The water level was observed to be at EL 5110.5 feet during the inspection on October 17, 2022.

In 1993, the pond was re-permitted to an operating level of EL 5118.6 feet (NGVD29). In 1997, a reassessment of the flood pool allocation revealed the need to lower the operating level to EL 5117.8 feet (NGVD29). In April 1999, APS obtained a major modification of the ADEQ APP permit, File No. 100568, that allows dewatered bottom ash to be dredged from the pond and placed in a new facility known as the Bottom Ash Monofill located on a 43-acre parcel located adjacent to the north and east sides of the Bottom Ash Pond.

3.3 BOTTOM ASH MONOFILL

The Bottom Ash Monofill is represented on Figure 3 – Bottom Ash Monofill Site Map (attached).

The Bottom Ash Monofill is a coal combustion waste landfill that was constructed beginning in the late 1990s. In 2009, the Arizona Department of Environmental Quality (ADEQ) executed an amendment to Cholla Plant Aquifer Protection Permit No. P-100568 for the currently-permitted 43-acre footprint and maximum storage elevation of 5,261.0 feet, with final slopes of 4H:1V (horizontal : vertical). Storm water run on is diverted around the landfill by a diversion ditch sized to convey the peak 100-year flow. On-site storm water runoff is conveyed to a retention basin and eventually routed to the Bottom Ash Pond. The retention basin has a capacity of 8.2 acre-feet with an overall depth of 12 feet and 3H:1V side slopes.

In 2015, the Bottom Ash Monofill was expanded to the north and east to its maximum APP-permitted footprint to add capacity for continuing operations at the Plant.

4.0 FIELD INSPECTIONS

This section contains the 2022 annual field inspections conducted by APS and accompanied by a representative from AECOM at the Fly Ash Dam (Section 4.1), the Bottom Ash Dam (Section 4.2), and the Bottom Ash Monofill (Section 4.3).

4.1 APS FIELD INSPECTION – FLY ASH DAM

<table>
<tr><td colspan="2">Fly Ash Dam</td><td colspan="2">State Identification Number (SID): 09.28</td><td rowspan="16">Not Applicable</td><td rowspan="16">No</td><td rowspan="16">Yes</td><td rowspan="16">Monitor</td><td rowspan="16">Repair</td><td rowspan="16">Investigate</td></tr>
<tr><td>SID: 09.28</td><td>Dam Name: Fly Ash Dam</td><td>Type: Earth</td><td>Purpose: Fly ash disposal</td></tr>
<tr><td colspan="2">Contact(s): Ray Markley, P.E. (APS)</td><td colspan="2">Report Date: January 19, 2023</td></tr>
<tr><td colspan="2">Inspected by: Ray Markley, P.E. (APS)
Lee Wright, P.E. (AECOM)</td><td colspan="2">Inspection Date: October 17, 2022</td></tr>
<tr><td colspan="2">Reviewed by: Ray Markley, P.E. (APS)</td><td colspan="2">Review Date: January 16, 2023</td></tr>
<tr><td colspan="2">Design Dam Crest Elevation (ft): 5,120</td><td colspan="2">Design Spillway Crest Elevation: None</td></tr>
<tr><td colspan="2">Design Total Freeboard (ft): 6</td><td colspan="2">Measured Total Freeboard (ft): 34.7
(October 13, 2022; based on the elevation at Settlement Monument M-5 of 5117.899 feet)</td></tr>
<tr><td colspan="2">Statutory Dam Height (ft): 80</td><td colspan="2">Structural Height (ft): 80</td></tr>
<tr><td colspan="2">Dam Crest Length (ft): 4,583</td><td>Upstream Slope: 3:1</td><td>Downstream Slope: 3:1</td></tr>
<tr><td colspan="2" rowspan="2">Dam Crest Width (ft): 24</td><td>Lat: 34° 56' 10.0" N</td><td rowspan="2">Water Rights: N/A</td></tr>
<tr><td>Long: 110° 16' 06.0" W</td></tr>
<tr><td colspan="2">Reservoir Area (acres): 420</td><td colspan="2">Reservoir Storage (ac-ft): 18,000</td></tr>
<tr><td colspan="4">Inflow Design Flood/Safe Flood-Passing Capacity: PMF – fully contained</td></tr>
<tr><td colspan="2">Reservoir Level During Inspection (ft): EL 5083.243
(October 13, 2022)</td><td rowspan="2">Photos: Yes. See Appendix A.</td><td rowspan="2">Pages: 5</td></tr>
<tr><td colspan="2">Estimated Solids Level (ft): ~ EL 5095.98 at the discharge pipe</td></tr>
</table>

Fly Ash Dam		SID: **09.28**		N/A	No	Yes	Mon	Rep	Inv
COMPLIANCE CHECKLIST									
1	***CONDITION SUMMARY, LICENSE, EAP, NEXT INSPECTION***								
a	Recorded downstream hazard: **High**	Should hazard be revised?			**X**				
b	If high hazard, estimate downstream persons-at-risk (PAR): **>301**	Is there a significant increase since the last inspection?			**X**				
c	Recorded size: **Intermediate**	Should size be revised?			**X**				
d	Any safety deficiencies? **No**	Describe:			**X**				
e	Any statute or rule violations? **No**	Describe and list required action:			**X**				
f	Safe storage level on License: **5,114 feet**	Should level be revised:			**X**				
g	Any License violations? **No**	Describe and list required action:			**X**				
h	Date of current License: **10/21/1986**	Should new License be issued?			**X**				
i	Date of last Emergency Action Plan revision: **06/2022**	Should EAP be revised?			**X**				
j	Any Agency actions? **No**	Describe and list required action:			**X**				
k	Normal inspection frequency: **Weekly, Annually**	Should inspection frequency be revised?			**X**				
l	Recommended date for next inspection: **October 2023**								

MONITORING CHECKLIST									
2	***INSTRUMENTATION AND MONITORING***								
a	Describe:	**1) 37 active piezometers and wells in and around the embankment as part of the CCR monitoring program. 2) 16 settlement monuments located along the crest. 3) The water level in the reservoir is measured by GPS survey each month. 4) Flow measurement devices at each downstream sump and the return lines to the reservoir to estimate seepage rates.**							
b	Any repair or replacement required? **No**	Describe: **See comment i.**			**X**				
c	Date of last report: **January 2022 (for 2021)**	Should new readings be taken and new report provided? **Annual reporting is required.**				**X**			

DAM EMBANKMENT CHECKLIST									
3	***DAM CREST***								
a	Settlements, slides, depressions?	**See comment vii.**				**X**			**X**
b	Misalignment?				**X**				
c	Longitudinal/Transverse cracking?	**None observed.**			**X**				
d	Animal burrows?	**Ant hills were observed at various locations across the crest (Photos IMG_3449 and IMG_3463).**				**X**	**X**		
e	Adverse vegetation?	**Some adverse vegetation is present (Photos IMG_3394 and IMG_3401). Remove vegetation in accordance with APS's preferred protocol, the NMOSE "*Vegetation Management on Dams*" (2011) document.**				**X**		**X**	
f	Erosion?				**X**				
4	***UPSTREAM SLOPE***								
a	Erosion?	**Minor erosion and soil wasting observed along the upstream shoulder. See comment iii.**				**X**	**X**		
b	Inadequate ground cover?				**X**				
c	Adverse vegetation?	**None observed. Continue to monitor vegetation.**			**X**		**X**		
d	Longitudinal/Transverse cracking?				**X**				
e	Inadequate riprap?				**X**				
f	Stone deterioration?	**Minor deterioration observed. See comment iv.**				**X**	**X**		
g	Settlements, slides, depressions, bulges?				**X**				
h	Animal burrows?	**None observed. Continue to monitor.**			**X**		**X**		

Fly Ash Dam		SID: **09.28**	N/A	No	Yes	Mon	Rep	Inv
5	***DOWNSTREAM SLOPE***							
a	Erosion?	**Approximately 1 foot of erosion observed on the ramp near the Geronimo Sump with sediment washed onto the access road (Photo IMG_3487). Sediment deposits at the toe near the Geronimo Sump formed alluvial fans where the sediment originally encountered standing water. Repair and continue to monitor.**			**X**	**X**	**X**	
b	Inadequate ground cover?			**X**				
c	Adverse vegetation?	**None observed. Continue to monitor.**		**X**		**X**		
d	Longitudinal/Transverse cracking?			**X**				
e	Inadequate riprap?			**X**				
f	Stone deterioration?	**Minor deterioration observed. See comment iv.**			**X**	**X**		
g	Settlements, slides, depressions, bulges?			**X**				
h	Soft spots or boggy areas?	**There is evidence of historic seepage beyond the downstream toe. Continue to monitor.**			**X**	**X**		
i	Movement at or beyond toe?			**X**				
j	Animal burrows?	**None observed. Continue to monitor.**		**X**		**X**		
6	***ABUTMENT CONTACTS***							
a	Erosion?	**Approximately 1 foot of erosion observed at the Right Abutment groin. The erosion is in the native rock at the Right Abutment and along the access road at the toe (Photos IMG_3459 and IMG_3492). Continue to monitor.**		**X**		**X**		
b	Differential movement?			**X**				
c	Cracks?			**X**				
d	Settlements, slides, depressions, bulges?			**X**				
e	Seepage?	**Historic seepage has been observed downstream of the Right Abutment during previous inspections. See comment v.**		**X**		**X**		
f	Animal burrows?	**None observed. Continue to monitor.**		**X**		**X**		
7	***SEEPAGE/PIPING CONTROL DESIGN FEATURE(S)***							
a	Describe:	**1) The Geronimo and Hunt seepage collection and pump back systems are located downstream of the dam near I-40 for fluid interception. See comment v.** **2) Discharge from the crest side of the reservoir creates a beach to prevent water from being stored against the upstream face.**						
b	Internal drains flowing?				**X**	**X**		
c	Seepage at or beyond toe?	**See comment v.**			**X**	**X**		
d	If so, does seepage contain fines?	**Sumps A-D could not be inspected due to the construction. See comment v.**	**X**					
e	Evidence of sand boils at or beyond toe?			**X**				

RESERVOIR CHECKLIST								
8	***RESERVOIR***							
a	High water marks?			**X**				
b	Erosion/slides into pool area?			**X**				
c	Sediment accumulation?	**The reservoir was designed to impound sediment.**			**X**			
d	Floating debris present?			**X**				
e	Depressions, sinkholes, or vortices?			**X**				
f	Low ridges/saddles allowing overflow?			**X**				
g	Structures below dam crest elevation?			**X**				

Additional comments and recommendations for the Fly Ash Dam:

i. APS measures the reservoir level by GPS survey at the same time as the monthly monument readings. The accuracy of this method is assessed to be adequate as long as the water level remains low.

   The original water level gauge has been abandoned. The gauge was first covered with sediment in early 2015. By the time the reservoir level had receded below the maximum elevation on the water level gauge in early 2016, the gauge had been covered with a thick layer of sediment and evaporite crystals, making it unusable.

ii. In May 2021, APS replaced extraction wells GSX-1 and GSX-2; monitoring wells W-123 and W-126; and piezometers F-91, F-92, and F-111 in the Geronimo Sump area as part of a broader well and piezometer abandonment and replacement program (Wood 2021). Of these, piezometers F-91, F-92, and F-111; and well W-123 are monitored as part of the CCR program. Piezometers F-91, F-92, and F-111; and well W-123 were replaced with open-standpipe piezometers F-91R, F-92R, F-111R, and well W-123R, respectively. Additional information is provided in Section 5.1.2.

iii. Minor erosion was observed along the upstream slope near the piezometers screened in the dam core (Photos IMG_3405, IMG_3408, and IMG_3413). The eroded portions were observed to be deeper during this inspection compared to the 2021 inspection. The affected portion of the upstream slope is part of the dam crest widening constructed in early 2000 to accommodate piezometer installation activities. The crest is approximately 40 feet wide in this area (compared to the design crest width of 24 feet). The erosion appears to be within the extended portion and is not affecting the original crest.

iv. Minor stone deterioration was also observed at various locations along the slopes during previous inspections. Continue to monitor.

v. Seepage has historically been observed at the Geronimo Seep, the Hunt seep, the I-40 seep, and in areas of relatively lower elevation along the downstream toe. The Geronimo and Hunt sumps were active during the inspection while areas downstream of the West Embankment were dry. APS replaced Geronimo Seep well pumps A and B (GSX-1 and GSX-2) in May 2021 after observing they were operating inconsistently, had relatively low extraction rates, and erratic water levels (Wood 2021). The well pump replacement coincided with the abandonment and replacement of the piezometers and wells described in comment ii.

   APS is in the process of upgrading the seepage collection system at the Geronimo Seep. During this inspection, APS was installing new piping for the four new extraction wells (EW-01 through EW-04) installed to replace the four Geronimo Seep well pumps (A through D) (Photos IMG_3509, IMG_3522, and IMG_3530). The extraction wells could not be inspected for the presence of fines due to the construction.

   APS monitors the turbidity at the Geronimo Sump and observed the turbidity during 2022 (0.82 NTU average) was generally higher than the turbidity observed during 2020 (0.51 NTU average), but less than the 10 readings taken in 2021 (1.68 NTU average). The meter used to take the turbidity readings was out of service between September 2020 and February 2021. A new meter was operational starting in March 2021. Considering the apparent NTU increase coinciding with the use of a new meter, the turbidity should be

reviewed with the APS geotechnical engineer to assess the implication of the recent turbidity measurements on the performance of the dam.

The I-40 seep was observed to be in a damp condition during this inspection (Photo IMG_3554). Approximately 0.74 inches of rain had fallen during the previous two days, but the I-40 seep remained damp on October 21 after several days of dry weather. The elevation of the seep is still below the current reservoir level. Continue to monitor the I-40 seep. Any perceived increases in seepage volume, affected area, or perpetual standing water should be reviewed by the APS geotechnical engineer.

vi. APS installed 12 PittBoss downdraft evaporators, manufactured by Resource West Incorporated (RWI), in the Fly Ash Pond as part of its effort to reduce the impounded water volume prior to closure (Photos IMG_3381 and IMG_3386). The PittBoss evaporators float on the pond and blow air onto the water to create small waves, increasing the surface area available for evaporation.

vii. Settlement monument M-2 appears to be more than one foot above the typical elevation of the crest (Photo IMG_3458). During the October 13, 2022 survey, settlement monument M-2 was recorded to be at EL 5120.420 feet. The original elevation recorded in 1978 was 5121.515 feet, indicating approximately 1 foot of settlement at the monument. It is not clear as to how much of the discrepancy between M-2 and the crest is due to historic surface grading activities or wind erosion of the crest.

Settlement Monument M-5 is approximately 2.1 feet lower than the design crest elevation. The available freeboard is sufficient to meet the capacity for the design storm. APS intends to continue removing water from the Fly Ash Pond and does not believe the lower crest is disruptive to the operation or safety of the CCR unit.

viii. Continue removing excessive natural vegetation in accordance with APS's preferred protocol, the NMOSE "*Vegetation Management on Dams*" (2011) document.

ix. The weekly inspection reports for the period between October 1, 2021 and September 30, 2022 do not indicate that there were any appearances of actual or potential structural weakness or other conditions that have the potential to disrupt the operation or safety of the CCR unit.

4.2 APS FIELD INSPECTION – BOTTOM ASH DAM

<table>
<tr><td colspan="2">Bottom Ash Dam</td><td colspan="2">State Identification Number (SID): 09.27</td><td rowspan="15">Not Applicable</td><td rowspan="15">No</td><td rowspan="15">Yes</td><td rowspan="15">Monitor</td><td rowspan="15">Repair</td><td rowspan="15">Investigate</td></tr>
<tr><td>SID: 09.27</td><td>Dam Name: Bottom Ash Dam</td><td>Type: Earth</td><td>Purpose: Bottom ash containment</td></tr>
<tr><td colspan="2">Contact(s): Ray Markley, P.E. (APS)</td><td colspan="2">Report Date: January 19, 2023</td></tr>
<tr><td colspan="2">Inspected by: Ray Markley, P.E. (APS)
Lee Wright, P.E. (AECOM)</td><td colspan="2">Inspection Date: October 17, 2022</td></tr>
<tr><td colspan="2">Reviewed by: Ray Markley, P.E. (APS)</td><td colspan="2">Review Date: January 16, 2023</td></tr>
<tr><td colspan="2">Design Dam Crest Elevation (ft): 5,123.3</td><td colspan="2">Design Spillway Crest Elevation: None</td></tr>
<tr><td colspan="2">Design Total Freeboard (ft): 5.5</td><td colspan="2">Measured Total Freeboard (ft): 12.8</td></tr>
<tr><td colspan="2">Statutory Dam Height (ft): 73</td><td colspan="2">Structural Height (ft): 73</td></tr>
<tr><td colspan="2">Dam Crest Length (ft): 4,040</td><td>Upstream Slope: 3:1</td><td>Downstream Slope: 3:1</td></tr>
<tr><td colspan="2" rowspan="2">Dam Crest Width (ft): 12</td><td>Lat: 34° 57' 07.0" N</td><td rowspan="2">Water Rights: N/A</td></tr>
<tr><td>Long: 110° 17' 22.7" W</td></tr>
<tr><td colspan="2">Reservoir Area (acres): 80</td><td colspan="2">Reservoir Storage (ac-ft): 2,300</td></tr>
<tr><td colspan="4">Inflow Design Flood/Safe Flood-Passing Capacity: PMF – fully contained.</td></tr>
<tr><td colspan="2">Reservoir Level During Inspection (ft): 5110.50</td><td rowspan="2">Photos: Yes. See Appendix B.</td><td rowspan="2">Pages: 5</td></tr>
<tr><td colspan="2">Estimated Solids Level (ft): Varies – approx. EL 5115 feet</td></tr>
</table>

Bottom Ash Dam		SID: **09.27**		N/A	No	Yes	Mon	Rep	Inv
COMPLIANCE CHECKLIST									
1	***CONDITION SUMMARY, LICENSE, EAP, NEXT INSPECTION***								
a	Recorded downstream hazard: **High**	Should hazard be revised?			**X**				
b	If high hazard, estimate downstream persons-at-risk (PAR): **>301**	Is there a significant increase since the last inspection?			**X**				
c	Recorded size: **Intermediate**	Should size be revisited?			**X**				
d	Any safety deficiencies? **No**	Describe:			**X**				
e	Any statute or rule violations? **No**	Describe and list required action:			**X**				
f	Safe storage level on License: **5,117.8 feet**	Should level be revised:			**X**				
g	Any License violations? **No**	Describe and list required action:			**X**				
h	Date of current License: **12/11/1998**	Should new License be issued?			**X**				
i	Date of last Emergency Action Plan revision: **06/2022**	Should EAP be revised?			**X**				
j	Any Agency actions? **No**	Describe and list required action:			**X**				
k	Normal inspection frequency: **Weekly, Annually**	Should inspection frequency be revised?			**X**				
l	Recommended date for next inspection: **October 2023**								

MONITORING CHECKLIST									
2	***INSTRUMENTATION AND MONITORING***								
a	Describe: **1) 19 active piezometers and wells in and around the embankment as part of the CCR monitoring program. 2) 10 settlement monuments. 3) A V-notch weir and seepage monitoring systems. 4) Water level gauge in the reservoir.**								
b	Any repair or replacement required? **No.**	Describe: **See comment i.**			**X**				
c	Date of last report: **January 2022 (for 2021)**	Should new readings be taken and new report provided? **Annual reporting is required.**				**X**			

DAM EMBANKMENT CHECKLIST								
3	***DAM CREST***							
a	Settlements, slides, depressions? **See comment ii.**		**X**		**X**			
b	Misalignment?		**X**					
c	Longitudinal/Transverse cracking? **See comment iii.**			**X**	**X**			
d	Animal burrows? **Ant hills were observed at various locations across the crest (example Photo IMG_3627).**			**X**	**X**			
e	Adverse vegetation? **Some vegetation was observed on the crest (Photos IMG_3599, IMG_3637, and IMG_3653). Remove vegetation in accordance with APS's preferred protocol, the NMOSE "*Vegetation Management on Dams*" (2011) document.**			**X**		**X**		
f	Erosion? **See comment iv.**			**X**	**X**			
4	***UPSTREAM SLOPE***							
a	Erosion? **There is a 21-inch deep hole adjacent to the concrete on the west side of the central siphon line (Photos IMG_3591 and IMG_3592) in addition to minor erosion near the crest observed. The hole near the central siphon lines should be repaired. The minor erosion near the crest should be monitored. See comment iv.**			**X**		**X**		
b	Inadequate ground cover?		**X**					
c	Adverse vegetation? **There is woody vegetation in the pond near the Right Abutment (Photo IMG_3565), near the central siphon line (Photo IMG_3590), and along the upstream slope of the East Embankment (Photo IMG_3618).**			**X**		**X**		
d	Longitudinal/Transverse cracking?		**X**					
e	Inadequate riprap?		**X**					
f	Stone deterioration?		**X**					
g	Settlements, slides, depressions, bulges?		**X**					
h	Animal burrows? **None observed. Continue to monitor.**		**X**		**X**			

Bottom Ash Dam			SID: **09.27**	N/A	No	Yes	Mon	Rep	Inv
5	***DOWNSTREAM SLOPE***								
a	Erosion?	**Erosion gullies at the toe of the East Embankment downstream slope do not appear to be affecting the embankment (Photos IMG_3663 and IMG_3665).**				**X**	**X**		
b	Inadequate ground cover?				**X**				
c	Adverse vegetation?	**Much of the dense vegetation near the West Abutment Weir is beginning to grow back (Photos IMG_3694 and IMG_3696) while the woody vegetation remains absent; however, some woody vegetation is beginning to grow along the toe (IMG_3697) and should be removed. Continue to monitor the area and remove vegetation in accordance with the NMOSE (2011) guidance.**				**X**	**X**	**X**	
d	Longitudinal/Transverse cracking?				**X**				
e	Inadequate riprap?				**X**				
f	Stone deterioration?	**Riprap deterioration does not appear to have accelerated since the previous inspection.**				**X**	**X**		
g	Settlements, slides, depressions, bulges?				**X**				
h	Soft spots or boggy areas?	**See comment v.**				**X**	**X**		
i	Movement at or beyond toe?				**X**				
j	Animal burrows?	**None observed. Continue to monitor.**			**X**		**X**		
6	***ABUTMENT CONTACTS***								
a	Erosion?	**There is erosion in the downstream groin of the Right Abutment (Photo IMG_3561 and IMG_3562). The erosion is as deep as 3.5 feet and should be repaired as directed by the APS geotechnical engineer.**				**X**		**X**	
b	Differential movement?				**X**				
c	Cracks?				**X**				
d	Settlements, slides, depressions, bulges?				**X**				
e	Seepage?	**Yes. Measured approximately 1.62 gpm at the West Abutment Weir during the inspection. Continue to monitor.**				**X**	**X**		
f	Animal burrows?	**None observed. Continue to monitor.**			**X**		**X**		
7	***SEEPAGE/PIPING CONTROL DESIGN FEATURE(S)***								
a	Describe:	**Several monitoring, seepage, and pump back collection systems are located downstream of the dam. The monitored seeps include the West Abutment Weir, the Toe Drain Seep, the Petroglyph Seep, the Tanner Wash Seep, and the P-226 Seep. The pump back collection system consists of three siphon lines extending from the toe into the reservoir along the South Embankment.**							
b	Internal drains flowing?					**X**	**X**		
c	Seepage at or beyond toe?	**See comment v.**				**X**	**X**		
d	If so, does seepage contain fines?	**The water in the Bottom Ash Toe Drain Sump was cloudy, similar to the 2021 inspection. See comment v.**				**X**	**X**		
e	Evidence of sand boils at or beyond toe?				**X**				

RESERVOIR CHECKLIST									
8	***RESERVOIR***								
a	High water marks?				**X**				
b	Erosion/slides into pool area?				**X**				
c	Sediment accumulation?	**Bottom ash settles in the reservoir, is removed, and is placed in the Bottom Ash Monofill.**				**X**			
d	Floating debris present?				**X**				
e	Depressions, sinkholes, or vortices?				**X**				
f	Low ridges/saddles allowing overflow?				**X**				
g	Structures below dam crest elevation?	**There is a divider dike in the center of the pond.**				**X**			

Additional comments and recommendations for the Bottom Ash Dam:

i. During the 2021 inspection, APS reported that the pumpback flowmeter at the eastern siphon was broken. The flowmeter was replaced on December 22, 2021. The new flowmeter indicated approximately 1.2 gallons per minute (gpm) of flow during the 2022 inspection.

ii. The 2.5-inch-deep depression observed along the upstream shoulder of the East Embankment during the 2021 inspection was not observable during this inspection (Photo IMG_3625). Continue to monitor the crest for surface depressions and repair such features as directed by the APS geotechnical engineer.

Many of the erosion holes observed along the crest and shoulders during the 2021 inspection were not observed during this inspection; however, several new holes were observed (Photos IMG_3567, IMG_3629, and IMG_3654). The deepest measured erosion hole was at least 10 inches (on the South Embankment). In general, fewer holes were observed during this inspection compared to the 2021 inspection. The holes on the crest and shoulders should be monitored and repaired if the depth exceeds 1 foot or appears to reach the core.

iii. A portion of the supporting fill material on the downstream side of settlement monument M-13 is separated from the concrete base (Photo IMG_3585). The separation observed during the 2022 inspection did not appear to be as extensive as the separation observed during the 2021 inspection. The supporting fill does not affect the structural integrity of the dam, but the crack should be monitored and repaired if a series of deviant readings are recorded for the horizontal or vertical measurements at M-13.

iv. Continue to monitor the erosion around the siphon line encasements (Photos IMG_3576, IMG_3594), soil wasting along the downstream slope of the East Embankment, and erosion gullies (Photos IMG_3663 and IMG_3665) that were also observed during previous inspections. Repair erosion if the eroded depth exceeds 1 foot. Investigate the source of sediment collecting in the diversion ditch between the East Embankment access road and the East Embankment.

Several incipient erosion rills were observed along the shoulders of the crest (Photos IMG_3566, IMG_3575, IMG_3639, and IMG_3646). The rills were generally less than 18 inches across and all were less than 1 foot deep. The erosion should be monitored and repaired if it is observed to exceed a depth of 1 foot or if it adversely affects the crest or slopes.

v. Seepage and boggy areas were observed along the downstream toe in locations of known and active seepage (e.g., the Petroglyph Seep, the Tanner Wash Seep, the Bottom Ash Toe Drain Sump, the West Abutment Weir, and the P-226 seepage intercept area). At the time of the inspection, the water in the Bottom Ash Toe Drain sump was relatively cloudier than the other sumps, the water in the Petroglyph Sump appeared clear (roots and grass were present in the sump, as well as the pipe draining into the sump), and the water in the Tanner Wash sump was clear. All four sumps were running during the inspection. The West Abutment Weir was also flowing during the inspection; a turbidity assessment is not possible for this location.

vi. The weekly inspection reports for the period between October 1, 2021 and September 30, 2022 do not indicate that there were any appearances of actual or potential structural weakness or other conditions that have the potential to disrupt the operation or safety of the CCR unit.

4.3 APS FIELD INSPECTION – BOTTOM ASH MONOFILL

<table>
<tr><td colspan="2">Bottom Ash Monofill</td><td colspan="2">State Identification Number (SID): N/A</td><td rowspan="12">Not Applicable</td><td rowspan="12">No</td><td rowspan="12">Yes</td><td rowspan="12">Monitor</td><td rowspan="12">Repair</td><td rowspan="12">Investigate</td></tr>
<tr><td>SID: N/A</td><td>Landfill Name: Bottom Ash Monofill</td><td>Type: Landfill</td><td>Purpose: Permanent Storage of Dry Bottom Ash Dredged from Bottom Ash Pond</td></tr>
<tr><td colspan="2">Contact(s): Ray Markley, P.E. (APS)</td><td colspan="2">Report Date: January 19, 2023</td></tr>
<tr><td colspan="2">Inspected by: Ray Markley, P.E. (APS)
Lee Wright, P.E. (AECOM)</td><td colspan="2">Inspection Date: October 17-18, 2022</td></tr>
<tr><td colspan="2">Reviewed by: Ray Markley, P.E. (APS)</td><td colspan="2">Review Date: January 16, 2023</td></tr>
<tr><td colspan="2">Design Maximum Ash Elevation (ft): 5261</td><td colspan="2">Current Ash Elevation: 5184 feet for capped west portion, 5116 feet for east portion.</td></tr>
<tr><td colspan="2">Dam Crest Length (ft): Not a dam, not applicable.</td><td>Design Side Slope: 4:1 (Final)</td><td>Observed Side Slope: 3:1, steeper (2:1) towards the south end of the west side.</td></tr>
<tr><td colspan="2" rowspan="2">Dam Crest Width (ft): Not a dam, not applicable.</td><td>Lat: 34° 57' 35.4"N</td><td rowspan="2">Water Rights: N/A</td></tr>
<tr><td>Long: 110° 17' 06.3"W</td></tr>
<tr><td colspan="2">Landfill Area (acres): 43 (maximum permitted area)</td><td colspan="2">Landfill Capacity (ac-ft): 2,417</td></tr>
<tr><td colspan="4">Inflow Design Flood/Safe Flood-Passing Capacity: Diversion of 100-year, 24-hour run-on storm</td></tr>
<tr><td colspan="2">Photos: Yes. See Appendix C.</td><td colspan="2">Pages: 3</td></tr>
</table>

Bottom Ash Monofill			SID: N/A	N/A	No	Yes	Mon	Rep	Inv
MONITORING CHECKLIST									
1	***INSTRUMENTATION AND MONITORING***								
a	Describe:	**There are no instruments or other monitoring devices for this structure.**							
b	Any repair or replacement required? **N/A**		Describe: **N/A**	**X**					
c	Date of last report:	**January 2022 (for 2021)**	Should new readings be taken and new report provided? **Annual reporting is required.**	**X**		**X**			
2	***CONDITION SUMMARY***								
a	Waste placed in good practices?					**X**			
3	***LANDFILL CONFIGURATION***								
a	Settlements, slides, slope instability?				**X**				
b	Cracking?				**X**				
c	Run on control?	**See comment ii.**				**X**		**X**	
d	Run off control?	**See comment ii.**				**X**			
e	Erosion?	**See comment iii.**				**X**		**X**	
f	Dust control issues?	**None observed.**			**X**				

Additional comments and recommendations for the Bottom Ash Monofill:

i. APS did not move any CCR from the Bottom Ash Pond to the Bottom Ash Monofill in 2022.

ii. The Bottom Ash Monofill layout features a perimeter drainage channel designed to capture and convey the 24-hour, 100-year offsite/run-on flows produced by the 98-acre watershed toward one of three historic discharge points. The design storm magnitude exceeds the 24-hour, 25-year requirement in § 257.81 of the CCR Rule (EPA 2015). There are several locations where either the perimeter drainage channel or the Stormwater Detention Basin require maintenance or repair due to erosion or reduced drainage capacity:

   a. Stormwater ponded behind a berm on the toe road (Photos IMG_3703 and IMG_3712), severe erosion along the perimeter drainage channel forming a tunnel (Photos IMG_3713 and IMG_3714), excessive erosion (Photo IMG_3717), reduced drainage capacity resulting in standing water in the perimeter drainage channel (Photos IMG_3723, IMG_3767, and IMG_3768), and excessive erosion at the Stormwater Detention Basin (Photos IMG_3769, IMG_3771, and IMG_3776).

   The Stormwater Detention Basin is an incised structure with no offsite conveyance. Over the last few years, APS has repaired erosion damage at the northwest corner, the southwest corner, and the inlet; however, erosion has continued in these areas. APS should assess the gradients entering the Stormwater Detention Basin at these locations and either reduce the entrance slope or place riprap to reduce the erosive potential of the run-on in order to prevent excessive erosion after the Plant closes.

iii. Shallow erosion rills were observed throughout the CCR unit (see Appendix C). In addition, new, deep erosion was observed in locations of historic erosion at the Stormwater Detention Basin as deep as 2.5 feet (Photos IMG_3769, IMG_3771, and IMG_3776). Continue to monitor these areas and repair erosion where the eroded depth exceeds 1 foot (see comment ii).

Erosion gullies as deep as 3 feet were observed in several locations on slopes across the CCR unit (Photos IMG_3730, IMG_3731, IMG_3733, IMG_3737, IMG_3740, IMG_3741, IMG_3757, IMG_3781, IMG_3784, and IMG_3794). In some of these erosion gullies, it was evident that the erosion had extended through the cover soil and into the underlying ash (Photos IMG_3731, IMG_3737, IMG_3784, and IMG_3794).

The erosion gully at the southern end of the BAM shown in IMG_3794 (Appendix C) should be conveyed to the Stormwater Detention Basin via a drainage swale according to the APS Cholla Ash Monofill APP drawing set (APS 2011). During the inspection, it appeared that this was the case. Ash eroded from the slopes, such as ash from other erosion gullies further north (Photo IMG_3781) should be removed to prevent discharge into the Stormwater Detention Basin. APS should repair all erosion gullies deeper than 1 foot, as well as any erosion gullies where ash is exposed and could be washed away in order to maintain the integrity of the BAM and the run-on/run-off system.

iv. The weekly inspection reports for the period between October 1, 2021 and September 30, 2022 were reviewed for content and completeness. The weekly inspection reports do not indicate that there were any appearances of actual or potential structural weakness or other conditions that have the potential to disrupt the operation or safety of the CCR unit.

5.0 DATA REVIEW

5.1 FLY ASH DAM

5.1.1 Geometry Changes Since Last Inspection

There have not been any significant changes to the geometry of the unit since the last inspection in 2021.

APS installed 12 PittBoss downdraft evaporators in August 2022. The PittBoss units float on the Fly Ash Pond surface and do not affect the dam.

APS performed a site survey, which included an aerial survey and bathymetry in the Fly Ash Pond, in 2022. The data from this survey was used to update elevations, the depth of CCR, and relevant site information for this report.

5.1.2 Instrumentation

The locations of geotechnical and other related instrumentation in the vicinity of the Fly Ash Dam are shown on Figure 4 – Fly Ash Dam Instrumentation Map.

The minimum and maximum recorded readings for each instrument over the October 1, 2021 – September 30, 2022 (current) review period are reported in the following table:

Instrument Name	Minimum	Maximum	Unit
Open Standpipe Piezometers (10/1/21 to 9/30/22)			
F-81	5058.14	5059.25	Water Elevation (ft)
F-88	5002.59	5006.28	Water Elevation (ft)
F-89	5052.05	5053.69	Water Elevation (ft)
F-90	4995.60	4999.53	Water Elevation (ft)
F-91R[1]	4995.96	5000.46	Water Elevation (ft)
F-92R[1]	5013.26	5014.57	Water Elevation (ft)
F-93	5017.17	5017.73	Water Elevation (ft)
F-100	5075.98	5076.88	Water Elevation (ft)
F-101	5047.22	5048.19	Water Elevation (ft)
F-102	5024.76	5025.60	Water Elevation (ft)
F-103	5017.88	5018.42	Water Elevation (ft)
F-104	5062.29	5063.73	Water Elevation (ft)
F-105	5079.46	5080.48	Water Elevation (ft)
F-106	5014.65	5017.78	Water Elevation (ft)
F-107	5025.10	5026.78	Water Elevation (ft)
F-108	5057.40	5060.00	Water Elevation (ft)
F-109	5033.65	5035.48	Water Elevation (ft)
F-110	5086.12	5087.20	Water Elevation (ft)

Instrument Name	Minimum	Maximum	Unit
F-111R[1]	5012.48	5014.41	Water Elevation (ft)
F-112	5027.14	5028.38	Water Elevation (ft)
F-113	5042.87	5044.00	Water Elevation (ft)
F-114	5025.17	5025.50	Water Elevation (ft)
F-115	5033.04	5034.39	Water Elevation (ft)
F-117	5083.05	5083.64	Water Elevation (ft)
F-123	5082.42	5085.77	Water Elevation (ft)
F-124	5084.32	5085.32	Water Elevation (ft)
F-125	Dry	Dry	Water Elevation (ft)
F-126	5075.17	5078.42	Water Elevation (ft)
F-127	5069.83	5070.99	Water Elevation (ft)
F-128	5087.99	5089.24	Water Elevation (ft)
F-129	5081.76	5091.75	Water Elevation (ft)
F-130	5074.01	5076.36	Water Elevation (ft)
F-131	5055.53	5057.36	Water Elevation (ft)
F-132	5083.86	5085.08	Water Elevation (ft)
F-133	5075.73	5078.97	Water Elevation (ft)
F-134	5060.87	5063.43	Water Elevation (ft)
W-123R[1]	5034.01	5034.82	Water Elevation (ft)
Settlement Monuments (10/1/21 to 9/30/22)			
M-1	5120.893	5120.952	Monument Elevation (ft)
M-2	5120.394	5120.444	Monument Elevation (ft)
M-3	5119.770	5119.841	Monument Elevation (ft)
M-4	5118.917	5118.988	Monument Elevation (ft)
M-5	5117.898	5117.972	Monument Elevation (ft)
M-5A	5117.700	5117.781	Monument Elevation (ft)
M-5B	5117.538	5117.587	Monument Elevation (ft)
M-5C	5117.835	5117.926	Monument Elevation (ft)
M-6	5118.934	5119.034	Monument Elevation (ft)
M-6A	5118.615	5118.663	Monument Elevation (ft)
M-6B	5119.640	5119.693	Monument Elevation (ft)
M-6C	5119.988	5120.057	Monument Elevation (ft)
M-7	5119.438	5119.498	Monument Elevation (ft)
M-8	5119.568	5119.637	Monument Elevation (ft)
M-9	5119.969	5120.028	Monument Elevation (ft)
M-10	5119.870	5120.016	Monument Elevation (ft)

Instrument Name	Minimum	Maximum	Unit
Totalizers (10/1/21 to 9/30/22)			
Geronimo	0.00[2]	11.17[2]	Average Flowrate (gpm)
Hunt	0.00[2]	15.90[2]	Average Flowrate (gpm)

1) Instrument was abandoned and replaced in May 2021. The "R" suffix designates the name assigned to the nearby replacement instrument.
2) The reference values are the minimum and maximum of calculated average flowrates for the available quarters.

The data for the piezometers during the current review period indicate that the water levels recorded in piezometers F-110 (screened in the alluvium underlying the dam), F-117 (screened in the Moqui Member of the Moenkopi Formation at the Left Abutment), and all four piezometers screened in the core of the dam – F-123, F-124, F-128, and F-132 – are higher than the most recently measured (present) reservoir water level (5083.243 ft. on October 13, 2022). The higher water levels are attributed to the intentionally rapid decrease in the reservoir level as APS prepares the Fly Ash Pond for closure, the relatively low hydraulic permeability of the core, and the slurry cutoff wall underlying the dam. Approximately 50 feet of CCR is impounded against the upstream slope of the dam near these piezometers, forming a buttress to prevent slope instability. APS will continue to monitor these and nearby instruments.

During this inspection, APS was in the process of replacing the extraction wells at the Geronimo Seep. Extraction Wells EW-01, EW-02, EW-03, and EW-04 and GSX-1R will replace Geronimo Sumps A, B, C, and D.

The data for the totalizers during the current review period indicate no significant changes or trends related to the performance of the dam. The Geronimo totalizer values have decreased along with the decreasing pond level. The Hunt totalizer values have increased relative to the 2021 inspection; however, the Hunt stations are several hundred feet downstream of the dam toe.

5.1.3 CCR and Water Elevations

The approximate minimum, maximum, and present depth, and elevation of the impounded water and CCR since the previous annual inspection (the October 1, 2021 – September 30, 2022 timeframe) are presented in the following table:

Water	Depth of Water (ft) (calculated)	Water Elevation (ft) (surveyed)	Measurement Location
Minimum	13.073	5082.073 (7/21/22)	East Side of Pond
Maximum	14.967	5083.967 (3/10/22)	East Side of Pond
Present (this inspection)	14.243	5083.243 (10/13/22)	East Side of Pond
CCR	**Depth of CCR (ft) (calculated)**	**CCR Elevation (ft) (estimated)**	**Measurement Location**
Minimum	56.4	~5095.4 (2021 inspection)	Inlet Pipe
Maximum	56.98	~5095.98 (2022 inspection)	Inlet Pipe
Present (this inspection)	56.98	~5095.98 (2022 inspection)	Inlet Pipe

Water elevation measurements are made by Plant surveyors using GPS techniques on a monthly basis.

The CCR elevation is estimated by measuring the gap from the invert of the discharge pipe to the top of the CCR surface at the time of the annual inspection. Based on these measurements, the CCR elevation was measured to be slightly higher during the 2022 inspection when compared to the 2021 inspection.

Reported water depths are calculated relative to the estimated lowest elevation of natural ground within the Fly Ash Pond. APS commissioned a bathymetric survey, performed in late August 2022, to aid in closure design. This bathymetry showed the lowest point in the reservoir is approximately EL 5069 feet (Industrial Aerobotics 2022). The 2022 bathymetry was used to estimate the maximum and minimum water depth during the review period. Reported CCR depths are calculated relative to the estimated lowest elevation (approximately EL 5039 feet) of the intersection of the upstream slope of the dam with natural ground, based on original as-built dam construction drawings (APS 1977).

5.1.4 Storage Capacity

The storage capacity of the CCR unit at the time of the inspection was 18,000 acre-feet (ac-ft). This value is based on the existing dam design.

5.1.5 Approximate Impounded Volume at Time of Inspection

The approximate volume of impounded water and CCR at the time of the inspection was 6,615.4 ac-ft. The volume is estimated in three steps: 1) the volume of CCR and water below the current water level, from the Elevation-Area-Capacity curve for the reservoir; 2) the volume of CCR above the water level, based on the maximum elevation measured during the inspection, areal measurements, and a truncated pyramid volume estimate; and 3) the reported volume of ash relocated from Ash Pond 1 (Section 5.1.6).

5.1.6 Structural Weakness or Operational Change/Disruption

No conditions associated with structural weakness were identified during the field inspection.

No conditions that are or could be disruptive to the operation and safety of the CCR unit and appurtenant structures were identified during the field inspection.

APS completed the relocation of 766,988.8 cubic yards (475.4 ac-ft) of CCR from Ash Pond 1 to the Fly Ash Pond reservoir for use as fill during closure construction in 2022. The material was placed within the reservoir, above the pond level, on the left abutment/hillside.

APS installed 12 PittBoss downdraft evaporators manufactured by Resource West Incorporated (RWI) in the Fly Ash Pond during August 2021. The PittBoss units do not affect the dam, but are intended to accelerate evaporation of water from the reservoir.

5.2 BOTTOM ASH DAM

5.2.1 Geometry Changes Since Last Inspection

There have not been any significant changes to the geometry of the unit since the last inspection in 2021.

5.2.2 Instrumentation

The locations of geotechnical and other related instrumentation in the vicinity of the Bottom Ash Dam are shown on Figure 5 – Bottom Ash Dam Instrumentation Map.

The minimum and maximum recorded readings for each instrument over the October 1, 2021 – September 30, 2022 (current) review period are reported in the following table. The maximum and minimum values for these instruments are included in the following table.

Instrument Name	Minimum	Maximum	Unit
Open Standpipe Piezometers (10/1/21 to 9/30/22)			
B-200	5047.78	5050.22	Water Elevation (ft)
B-201	5044.35	5046.24	Water Elevation (ft)
B-202	5040.62	5041.29	Water Elevation (ft)
B-204	5096.25	5101.98	Water Elevation (ft)
B-206	5025.59	5029.18	Water Elevation (ft)
B-207	5030.45	5032.11	Water Elevation (ft)
B-208B	Dry	Dry	Water Elevation (ft)
B-209	5072.16	5073.41	Water Elevation (ft)
B-210	5066.11	5067.48	Water Elevation (ft)
B-211	Dry	Dry	Water Elevation (ft)
B-212	5091.54	5092.78	Water Elevation (ft)
B-213	5079.98	5081.01	Water Elevation (ft)
B-214	5079.42	5080.43	Water Elevation (ft)
B-215	5079.02	5079.64	Water Elevation (ft)
B-216	5070.86	5072.57	Water Elevation (ft)
B-217	5100.43	5102.07	Water Elevation (ft)
B-218	5094.67	5097.37	Water Elevation (ft)
B-225	5059.45	5060.90	Water Elevation (ft)
W-227	5091.61	5094.33	Water Elevation (ft)
Settlement Monuments (10/1/21 to 9/30/22)			
M-11	5123.201	5123.332	Monument Elevation (ft)
M-12	5122.672	5122.747	Monument Elevation (ft)
M-13	5122.615	5122.655	Monument Elevation (ft)
M-14	5119.329	5119.422	Monument Elevation (ft)
M-15	5122.923	5123.043	Monument Elevation (ft)

Instrument Name	Minimum	Maximum	Unit
M-16	5123.434	5123.493	Monument Elevation (ft)
M-17	5122.887	5122.974	Monument Elevation (ft)
M-18	5123.189	5123.284	Monument Elevation (ft)
M-19	5123.347	5123.492	Monument Elevation (ft)
PI	5123.363	5123.455	Monument Elevation (ft)
Totalizers (10/1/21 to 9/30/22)			
West Abutment Totalizer	5.34[2]	7.22[2]	Average Flowrate (gpm)
West Abutment Weir	1.10[2]	2.69[2]	Average Flowrate (gpm)
P-226[1]	3.80[2]	31.22[2]	Average Flowrate (gpm)
Tanner Wash Totalizer	4.45[2]	6.85[2]	Average Flowrate (gpm)
Petroglyph	1.98[2]	6.41[2]	Average Flowrate (gpm)

1) Due to transcription errors, only two quarterly flowrates are available for the P-226 totalizer.
2) The reference values are the minimum and maximum of calculated average flowrates for the available quarters.

The water levels recorded in the piezometers monitored at the Bottom Ash Dam generally followed the trends exhibited by the Bottom Ash Pond level throughout the year. The data for the piezometers indicate no significant elevation changes or trends related to the performance of the dam during the current review period.

The data for the settlement monuments during the current review period indicate no significant elevation changes or trends related to the performance of the dam.

The data for the totalizers and seeps during the current review period indicates that the seepage flow rates appear to be proportional to the Bottom Ash Pond water elevation. The higher flowrates were recorded during March 2022 when the Bottom Ash Pond exceeded EL 5114 feet. The Bottom Ash Pond receded to EL 5110 feet in September 2022.

5.2.3 CCR and Water Elevations

The approximate minimum, maximum, and present depth, and elevation of the impounded water and CCR since the previous annual inspection is presented in the following table:

Water	Depth of Water (ft) (calculated)	Water Elevation (ft) (measured)	Measurement Location
Minimum	10.0	5110.0 (9/16-21/2022)	Upstream slope at the staff gauge
Maximum	14.6	5114.6 (4/13/2022)	Upstream slope at the staff gauge
Present (this inspection)	10.5	5110.5 (NGVD29)	Upstream slope at the staff gauge
CCR	**Depth of CCR (ft) (calculated)**	**CCR Elevation (ft) (estimated)**	**Measurement Location**
Minimum	30-45	5115-5130 (NGVD29)	Visual observation in the north end of the impoundment and around the divider dikes
Maximum	~45	~5100 (NGVD29)	Upstream slope at the staff gauge
Present (this inspection)	30-45	5100-5115 (NGVD29)	Visual observation in the East Decant Cell

Water elevation measurements are made by Plant personnel on a daily basis by reading the staff gauge on the upstream slope along the South Embankment of the dam. APS constructed divider dikes in 2009 to create the East and West Decant Cells in the northern half of the reservoir. The divider dikes were constructed on top of the existing impounded ash and currently prevent most of the newly deposited ash from reaching the South Embankment. Since the water elevation is measured against the South Embankment, the resulting water depth is calculated based on the depth of impounded water to the top of previously deposited bottom ash.

The CCR elevation varies throughout the year based on the volume of ash discharged to the reservoir and the volume of ash taken to the Bottom Ash Monofill. The CCR elevation and depth of CCR are estimated based on observations of ash levels around the divider dikes, ash levels in the East Decant Cell, recent ash excavation activity, and preconstruction topography. CCR depths are based on a minimum original ground surface elevation of 5055 feet along the upstream toe of the South Embankment near the current staff gauge location (APS Drawing #G-44556). The maximum CCR depth is typically along the southeast side of the East Decant Cell divider dike where the original topography is lowest and the minimum CCR depth is typically in the north half of the reservoir where the original topography is relatively higher.

APS historically excavated bottom ash from the Bottom Ash Pond at various times throughout the year and would place it in the Bottom Ash Monofill. However, APS did not remove any ash in 2022.

5.2.4 Storage Capacity

The storage capacity of the CCR unit at the time of the inspection was 2,300 ac-ft. This value is based on the existing dam design.

5.2.5 Approximate Impounded Volume at Time of Inspection

APS has historically estimated the typical annual placement volume in the Bottom Ash Pond to be approximately 150,000 cubic yards per year. APS did not remove any ash in 2022. Using this value and assuming the impounded water volume is approximately stable throughout the year, the approximate volume of impounded water and CCR at the time of the inspection is 150,000 cubic yards more than during the 2021 inspection, (i.e., 2,029 ac-ft).

5.2.6 Structural Weakness or Operational Change/Disruption

No conditions associated with structural weakness were identified during the field inspection.

No conditions that are or could be disruptive to the operation and safety of the CCR unit and appurtenant structures were identified during the field inspection.

There are no significant changes to the structural integrity or operation of the impoundment since the 2021 inspection.

5.3 BOTTOM ASH MONOFILL

5.3.1 Geometry Changes Since Last Inspection

There have not been any significant changes to the geometry of the embankments since the last inspection in 2021. APS did not move any ash from the Bottom Ash Pond into the Bottom Ash Monofill in 2022.

5.3.2 Instrumentation

There are no instruments associated with the Bottom Ash Monofill.

5.3.3 CCR Volume

-The CCR unit is estimated to contain approximately 1,107.6 ac-ft at the time of the inspection. The CCR unit volume estimate, updated after each annual placement, is the basis for this estimate. The estimated maximum storage capacity is based on the design volume approved as part of the ADEQ APP (e.g., 2,417 ac-ft). APS did not move any ash from the Bottom Ash Pond into the Bottom Ash Monofill in 2022.

5.3.4 Structural Weakness or Operational Change/Disruption

No conditions associated with structural weakness were identified during the field inspection.

Erosion gullies as deep as 3 feet were observed in several locations on slopes across the CCR unit. In some of these erosion gullies, it was evident that the erosion had extended through the cover soil and into the underlying ash. Some ash was observed at the toe of the monofill slopes. In addition, there were several locations of reduced drainage capacity and standing water in the perimeter drainage channel. No other conditions that are or could be disruptive to the operation and safety of the CCR unit and appurtenant structures were identified during the field inspection.

6.0 OPERATION AND MAINTENANCE RECOMMENDATIONS

6.1 FLY ASH DAM

6.1.1 Current Fly Ash Dam Action Items

The following items were noted during this inspection as requiring attention.

Action Item	Action Status
1) Continue identifying and remediating scattered animal burrows and ant hills.	Mark ant hills and animal burrows identified during weekly inspections. NOTE: This will always be an ongoing maintenance activity.
2) Continue monitoring the groin of the Right Abutment, the downstream slope, and the access road near the Geronimo sumps for erosion.	Repair the erosion at the Right Abutment and continue to repair other areas when the eroded depth exceeds 1 foot.
3) Continue to maintain, treat, and remove excessive vegetation.	Remove trees, shrubs, and other deleterious vegetation on the dam as per NMOSE (2011). Large stumps should be removed, and the resulting void should be filled with compacted soil. NOTE: This will always be an ongoing maintenance activity.
4) Continue monitoring the riprap for additional signs of deterioration.	Replace riprap as needed.
5) Monitor erosion and soil wasting along the upstream slope.	Repair if the eroded depth exceeds 1 foot or if erosion reaches the original 24-foot-wide dam crest.
6) Continue to monitor seepage through the embankment.	NOTE: This will always be an ongoing maintenance activity.
7) Continue to monitor the I-40 seep.	Any perceived increases in seepage volume, affected area, or perpetual standing water should be reviewed by the APS geotechnical engineer.
8) Settlement monument M-2 is at least one foot higher than the crest.	Reconcile the difference between M-2 and the crest either by restoring the crest to EL 5120 feet or install a new survey monument on the crest.

6.1.2 Previous Fly Ash Dam Action Items

The following items were noted during the three previous annual inspections and have been addressed.

Action Item and First Instance of Observation	Resolution
1) The 2021 turbidity measurements at the Geronimo Sump were higher than the measurements in previous years.	Turbidity measurements over 1.0 should be reported to the APS geotechnical engineer to assess the significance of the trend. The turbidity values have generally decreased during 2022.
2) Monitor the 20-foot long, discontinuous, longitudinal crack on the upstream half of the crest near Settlement Monument M-5B (2020 inspection).	The crack was not present during the 2021 or 2022 inspections. Continue to monitor the area for reappearance.
3) Monitor the 6-foot-long longitudinal crack on the upstream shoulder of the crest south of Piezometer F-124 (2020 inspection).	The crack was not present during the 2021 or 2022 inspections. Continue to monitor the area for reappearance.
4) Seepage flowrates may be underestimated due to the presence of leaks in the piping system (2019 inspection).	Replacing leaking sections of pipe is included with ongoing maintenance activities.

6.2 BOTTOM ASH DAM

6.2.1 Current Bottom Ash Dam Action Items

The following items were noted during this inspection as requiring attention.

Action Item	Action Status
1) Monitor the crest for erosion holes during weekly inspections. Record the location and sizes of erosion holes during the weekly inspections. There is a 21-inch-deep hole adjacent to the concrete on the west side of the central siphon line.	Establish a regular schedule (e.g., semi-annually) to remediate holes identified in the crest. Establish a procedure to track the appearance of new holes and the disappearance of old holes. NOTE: This will always be an ongoing maintenance activity. Repair the 21-inch-deep hole.
2) Repair the 3.5-foot-deep erosion in the downstream groin of the Right Abutment.	The erosion should be restored with compacted, well-graded fill at the direction of the APS geotechnical engineer.
3) Repair the erosion gullies at the downstream slope of the East Embankment and the erosion in the downstream groin of the Right Abutment.	Repair erosion that has exceeded 1 foot in depth.
4) Continue identifying and remediating scattered animal burrows and ant hills.	Mark ant hills and animal burrows identified during weekly inspections. NOTE: This will always be an ongoing maintenance activity.
5) Continue to maintain, treat, and remove excessive vegetation, including vegetation on the upstream and downstream slopes.	Remove trees, shrubs, and other deleterious vegetation on the dam as per NMOSE (2011). Large stumps should be removed, and the resulting void should be filled with compacted soil. NOTE: This will always be an ongoing maintenance activity.
6) Continue monitoring the riprap for additional signs of deterioration.	Replace riprap as needed.
7) Continue to monitor seepage through the embankment.	Sumps should be clear of algae and other obstructions to facilitate observations of clear or cloudy seepage. NOTE: This will always be an ongoing maintenance activity.

8) Continue to monitor seepage areas, including the West Abutment Weir, for excessive vegetation.	Woody vegetation rooted in the embankment should be removed and the resulting disturbed area should be replaced with compacted material similar to the embankment material per NMOSE (2011).
9) Remove vegetation from the upstream slope at the Right Abutment.	Woody vegetation rooted in the embankment should be removed and the resulting disturbed area should be replaced with compacted material similar to the embankment material per NMOSE (2011).
10) Continue to monitor the erosion around the siphon line encasements and on the shoulder of the crest.	Repair erosion if the eroded depth exceeds 1 foot.
11) Continue to monitor the soil wasting observed along the downstream slope of the East Embankment near the Left Abutment access road.	Investigate the source of sediment collecting in the diversion ditch between the East Embankment access road and the East Embankment.
12) The downstream section of support material is separating from the concrete at Settlement Monument M-13.	Monitor M-13 and repair the section of support material that is separating from the concrete only if a series of deviant readings are recorded for the horizontal or vertical measurements. Record the position of M-13 via GPS immediately before and after any repairs.

6.2.2 Previous Bottom Ash Dam Action Items

The following items were noted during the three previous annual inspections and have been addressed.

Action Item and First Instance of Observation	Resolution
1) The pumpback flowmeter at the eastern siphon line is broken (2021 inspection).	The flowmeter was replaced on December 22, 2021.

6.3 BOTTOM ASH MONOFILL

6.3.1 Current Bottom Ash Monofill Action Items

The following items were noted during this inspection as requiring attention.

Action Item	Action Status
1) Erosion gullies several feet deep were observed at various locations at the CCR unit. Some erosion gullies extended into the ash underlying the soil cover.	Repair the erosion once it exceeds 1 foot in depth or reaches the underlying ash. NOTE: This will always be an ongoing maintenance activity.
2) There is CCR at the eastern toe of the Bottom Ash Monofill, west of the Stormwater Detention Basin that has eroded off the eastern slope.	Repair the slope and remove the CCR from the toe.
3) Standing water was observed in the perimeter drainage channel.	Grade the channel to drain to the Stormwater Detention Basin.
4) Severe erosion on the west side of the perimeter drainage channel has resulted in a tunnel leading into the channel.	Repair the erosion and fill in the tunnel with compacted fill under the direction of the APS Geotechnical Engineer.
5) There is an erosion gully several feet deep near the south end of the Bottom Ash Monofill.	Repair the erosion.
6) There is a low spot on the toe road where stormwater is ponding behind a berm.	Regrade the area such that water does not pond.
7) Severe erosion around the Stormwater Detention Basin.	Repair the erosion. Assess the gradients entering the Basin and consider reducing the entrance slope or placing riprap along the slopes to reduce the erosive potential of the run-on.

6.3.2 Previous Bottom Ash Monofill Action Items

All items noted during the three previous annual inspections either have been addressed or remain outstanding.

7.0 REFERENCES

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FIGURES

Last saved by: LEE.WRIGHT(2022-11-28) Last Plotted: 2022-11-28
Filename: L:\DCS\PROJECTS_WTR\60692686_APS_CH_2022_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 1 - FLY ASH POND.DWG

ANSI A 8.5" x 11"

CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

FLY ASH POND
SITE MAP

AECOM

FIGURE 1

Last saved by: LEE.WRIGHT(2022-11-28) Last Plotted: 2022-11-28
Filename: L:\DCS\PROJECTS_WTR\60692686_APS_CH_2022_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 2 - BOTTOM ASH POND.DWG
ANSI A 8.5" x 11"

CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

BOTTOM ASH POND
SITE MAP

AECOM

FIGURE 2

Last saved by: LEE.WRIGHT(2022-11-28) Last Plotted: 2022-11-28
Filename: L:\DCS\PROJECTS_WTR\60692686_APS_CH_2022_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 3 - BOTTOM ASH MONOFILL.DWG
ANSI A 8.5" x 11"

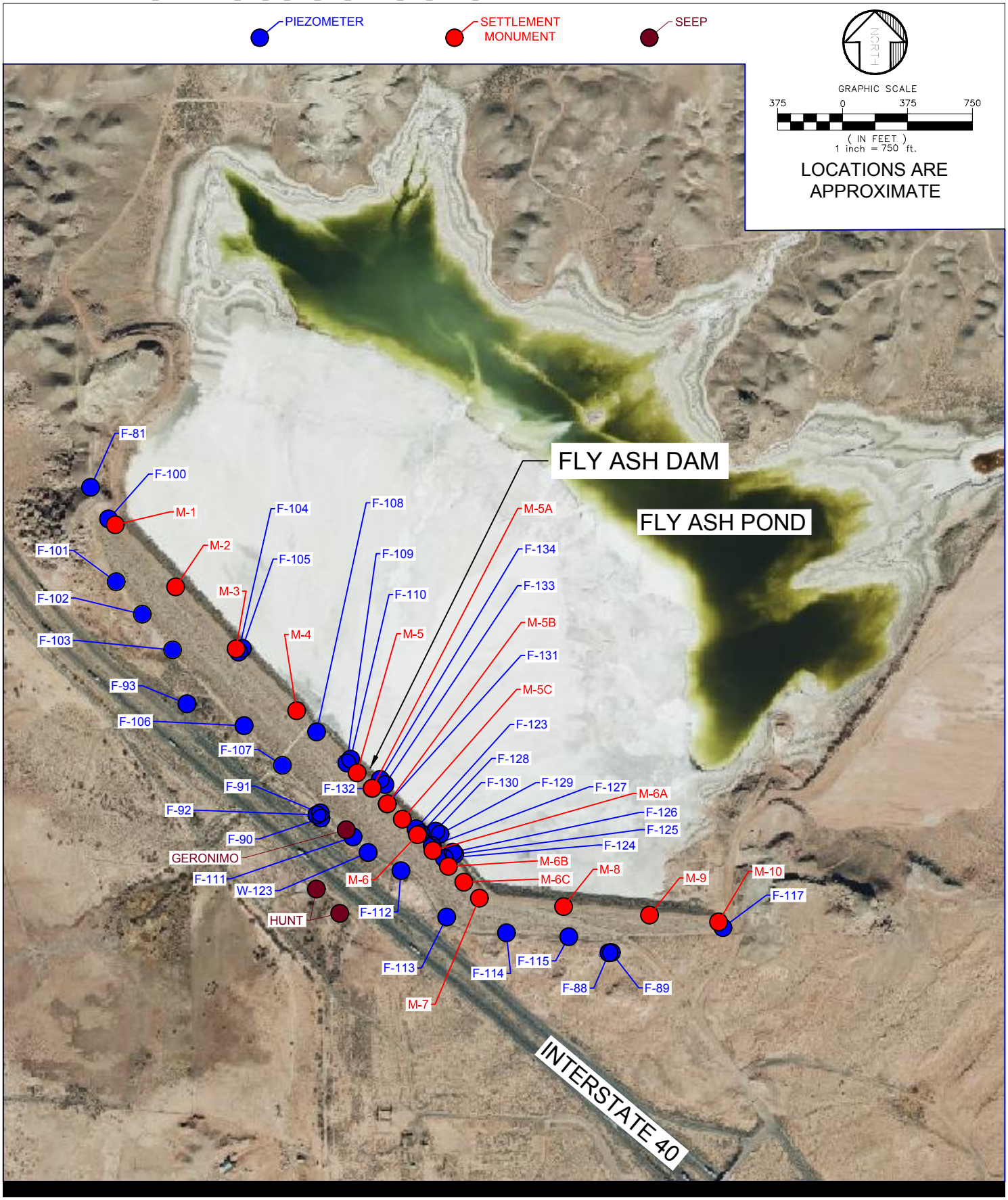
CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

BOTTOM ASH MONOFILL
SITE MAP

AECOM

FIGURE 3

Last saved by: LEE.WRIGHT(2022-11-28) Last Plotted: 2022-11-28
Filename: L:\DCS\PROJECTS_WTR\60692686_APS_CH_2022_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 4 - FLY ASH DAM INSTRUMENTS.DWG
ANSI A 8.5" x 11"



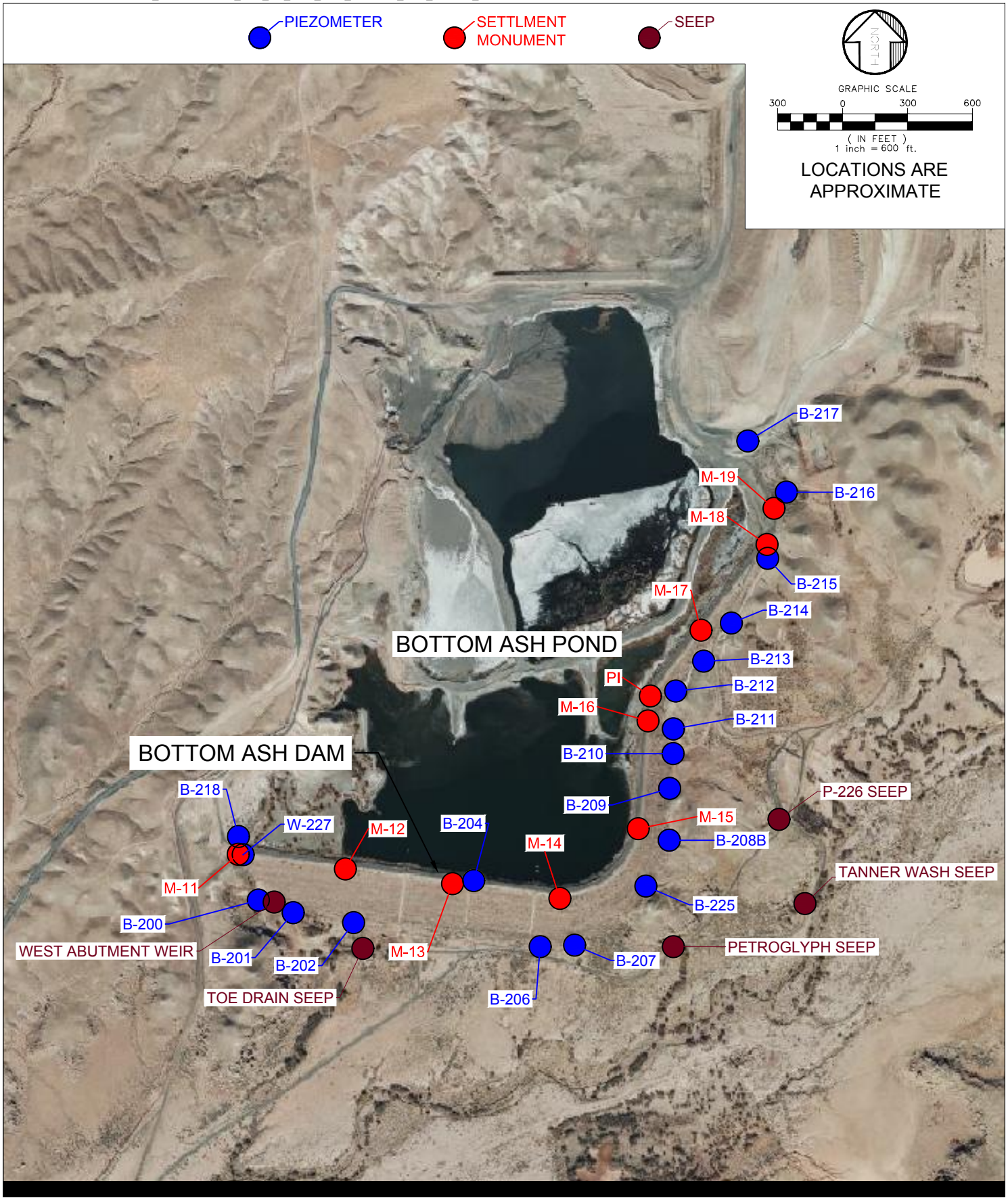
CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

FLY ASH DAM
INSTRUMENTATION MAP

AECOM

FIGURE 4

Last saved by: LEE.WRIGHT(2022-11-28) Last Plotted: 2022-11-28
Filename: L:\DCS\PROJECTS_WTR\60692686_APS_CH_2022_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 5 - BOTTOM ASH DAM INSTRUMENTS.DWG
ANSI A 8.5" x 11"



CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

BOTTOM ASH DAM
INSTRUMENTATION MAP

AECOM

FIGURE 5

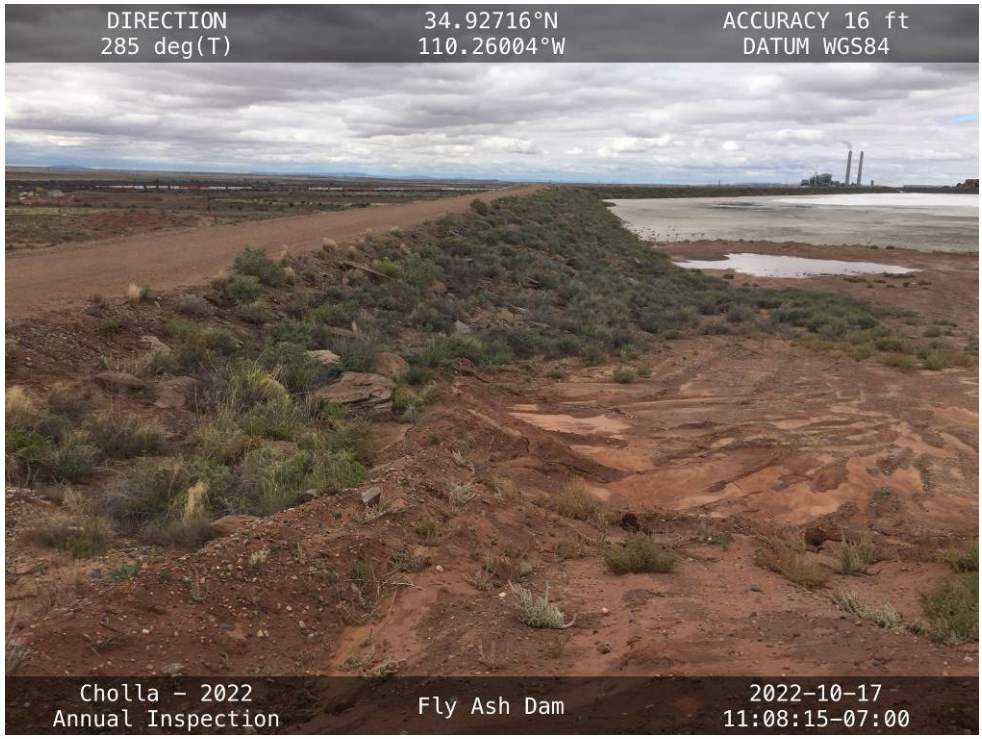
APPENDIX A

FLY ASH DAM PHOTO LOG

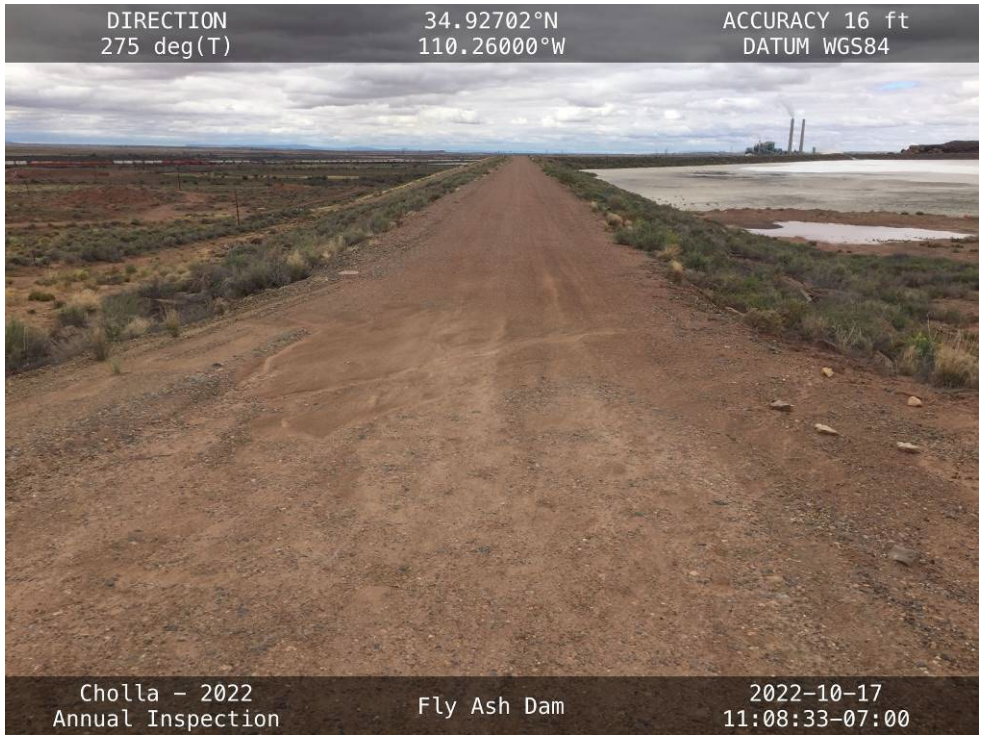
20221017 – IMG_3381
Downdraft evaporators in the Fly Ash Pond. One evaporator being removed for repairs.

20221017 – IMG_3386
Downdraft evaporators in the Fly Ash Pond.

20221017 – IMG_3389
Sign identifying allowed and disallowed materials in the Fly Ash Pond.



20221017 – IMG_3390
The upstream slope of the South Embankment, facing west from the Left Abutment.



20221017 – IMG_3391
The crest of the South Embankment, facing west from the Left Abutment.

20221017 – IMG_3392
The downstream slope of the South Embankment, facing west from the Left Abutment.

20221017 – IMG_3394
Vegetation to be removed from the upstream shoulder of the South Embankment crest.

20221017 – IMG_3398
The upstream slope of the South Embankment, facing east.

20221017 – IMG_3400
The downstream slope of the South Embankment, facing east.

20221017 – IMG_3401
Vegetation growing along the upstream shoulder of the South Embankment.

20221017 – IMG_3402
The upstream slope of the Fly Ash Dam, facing northwest from the South Embankment.

20221017 – IMG_3405
Minor erosion on the upstream side of the crest in an area where the crest is wider.

20221017 – IMG_3408

Minor erosion on the upstream side of the crest in an area where the crest is wider.

20221017 – IMG_3413

Erosion on the upstream side of the crest in an area where the crest is wider.

20221017 – IMG_3415

Erosion around piezometer F-123 on the downstream shoulder of the West Embankment crest.

20221017 – IMG_3417

The core piezometers along the crest of the West Embankment, facing southeast.

20221017 – IMG_3423
An erosion hole at least 3.5 inches deep along the upstream shoulder of the crest.

20221017 – IMG_3426
The inlet pipe depositing CCR into the impoundment.

20221017 – IMG_3431
The inlet pipes along the upstream slope.

20221017 – IMG_3434
The crest along the southern half of the West Embankment, facing southeast.

20221017 – IMG_3435
The inlet pipes along the downstream slope.

20221017 – IMG_3437
The downstream slope along the southern half of the West Embankment, facing southeast.

20221017 – IMG_3438
The downstream slope along the southern half of the West Embankment, facing southeast.

20221017 – IMG_3439
The crest along the northern half of the West Embankment, facing northwest.

20221017 – IMG_3440
The upstream slope along the northern half of the West Embankment, facing northwest.

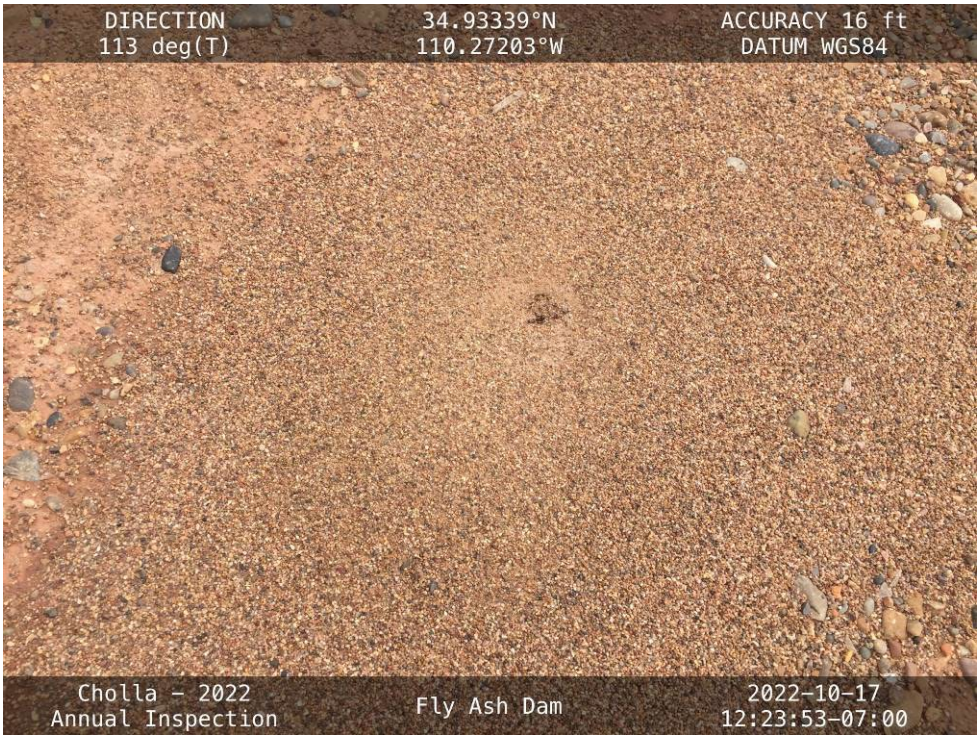
20221017 – IMG_3445
A broken pipe support along the inlet lines.

20221017 – IMG_3449
An ant hill on the embankment crest near the inlet lines.

20221017 – IMG_3458
Settlement monument M-2 on the crest of the West Embankment.

20221017 – IMG_3459
Erosion on the downstream side of the Right Abutment contact.

20221017 – IMG_3462
The downstream slope of the Fly Ash Dam, facing southeast from the Right Abutment.



20221017 – IMG_3463
An ant hill on the crest near the Right Abutment.

20221017 – IMG_3464
The crest of the Fly Ash Dam, facing southeast from the Right Abutment.

20221017 – IMG_3465
The upstream slope of the Fly Ash Dam, facing southeast from the Right Abutment.

20221017 – IMG_3477
The upstream slope along the northern half of the West Embankment, facing west.

20221017 – IMG_3487
Sediment eroded from the South Embankment slope onto the Geronimo sump access road.

20221017 – IMG_3505
The Hunt totalizer.

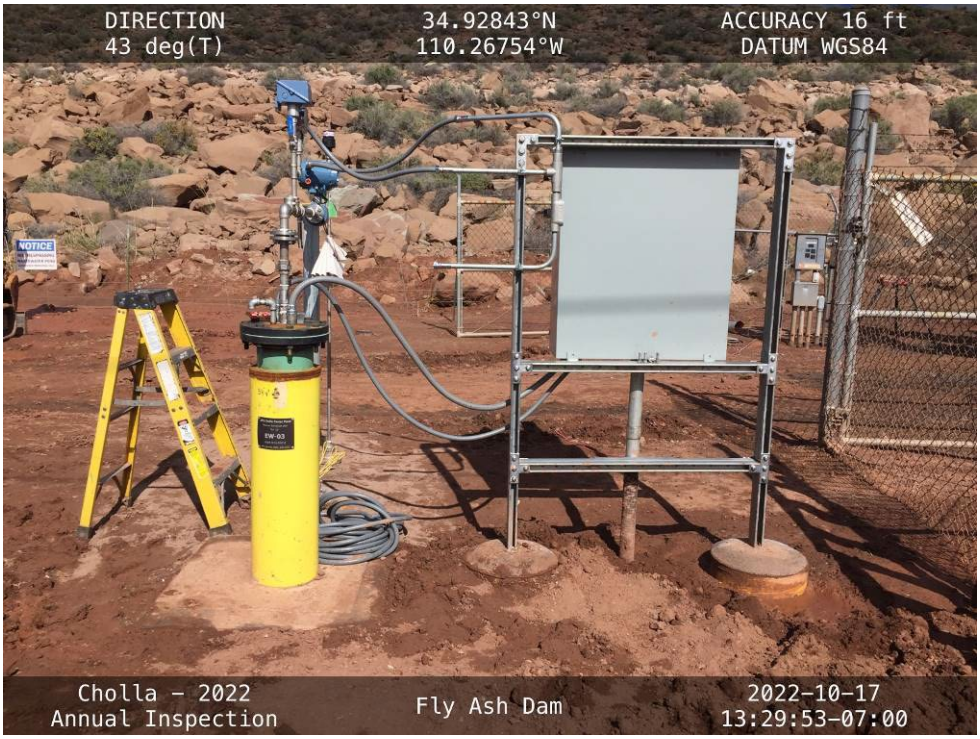
20221017 – IMG_3492
The Right Abutment groin on the downstream slope, facing toward the abutment contact.

20221017 – IMG_3498
The Geronimo totalizer.

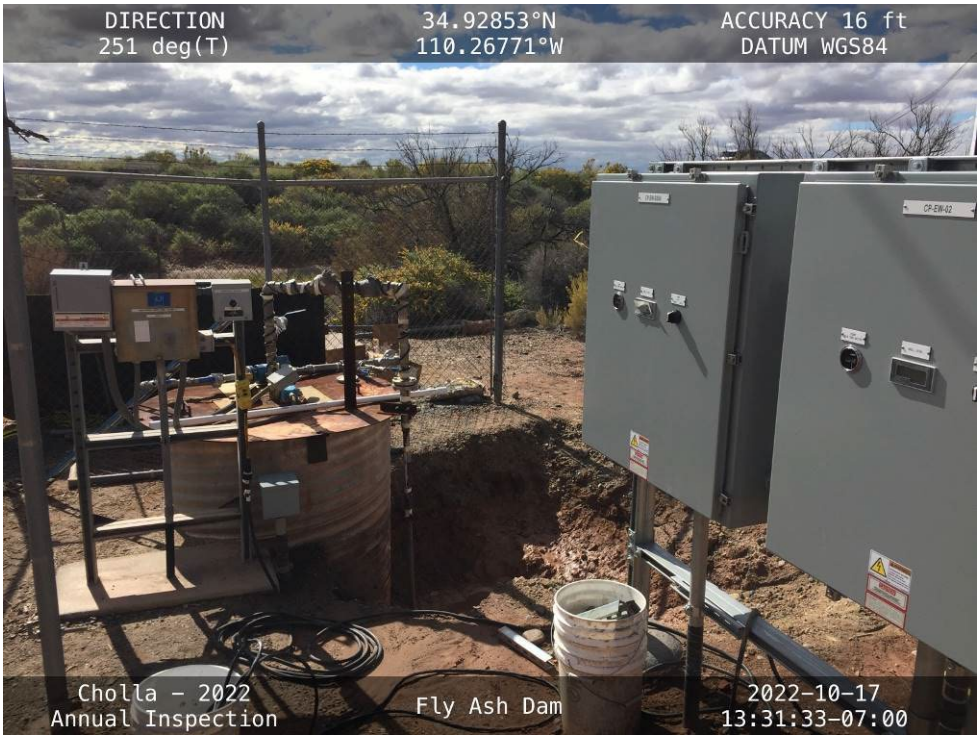
20221017 – IMG_3499
The downstream toe of the West Embankment, facing northwest from the inlet pipes.

20221017 – IMG_3500
The downstream toe of the West Embankment, facing southeast from the inlet pipes.

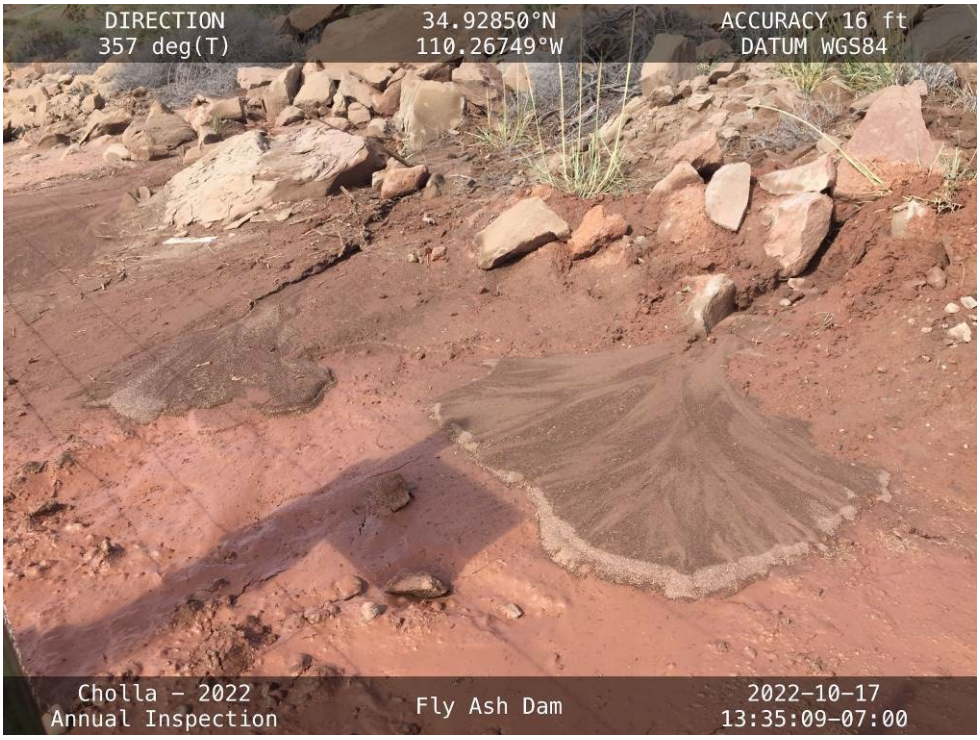
20221017 – IMG_3509
The Geronimo Seep area, with new monitoring wells and extraction wells.



20221017 – IMG_3522
New extraction well EW-03 at the Geronimo Seep.



20221017 – IMG_3530
Geronimo Seep Well Pump D in the process of being replaced.



20221017 – IMG_3541
Two alluvial fans at the toe of the West Embankment.

20221017 – IMG_3554
The I-40 seep.

APPENDIX B

BOTTOM ASH DAM PHOTO LOG

20221017 – IMG_3561
Erosion in the downstream groin of the Right Abutment, facing south from the abutment contact.

20221017 – IMG_3562
3.5 feet of erosion in the downstream groin of the Right Abutment.

20221017 – IMG_3563
The downstream slope of the South Embankment, facing east from the Right Abutment.

20221017 – IMG_3564
The South Embankment crest, facing east from the Right Abutment.

20221017 – IMG_3565
Trees and other woody vegetation to be removed from the South Embankment upstream slope.

20221017 – IMG_3566
An incipient erosion channel on the upstream side of the South Embankment shoulder.

20221017 – IMG_3567
An erosion hole at least 10 inches deep on the South Embankment crest.

20221017 – IMG_3575
Minor erosion around the concrete encasement for the western siphon line, facing upstream.

20221017 – IMG_3576

Minor erosion around the concrete encasement for the western siphon line, facing upstream.

20221017 – IMG_3577

The western siphon line along the upstream slope of the South Embankment.

20221017 – IMG_3578
The western siphon line along the downstream slope of the South Embankment.

20221017 – IMG_3585
The support material on the downstream side of M-13 separating from the concrete.

20221017 – IMG_3587

The reservoir level staff gauge adjacent to the central siphon lines. The water level is at EL 5110.50 feet.

20221017 – IMG_3588

The upstream slope along the western half of the South Embankment, facing west.

20221017 – IMG_3590

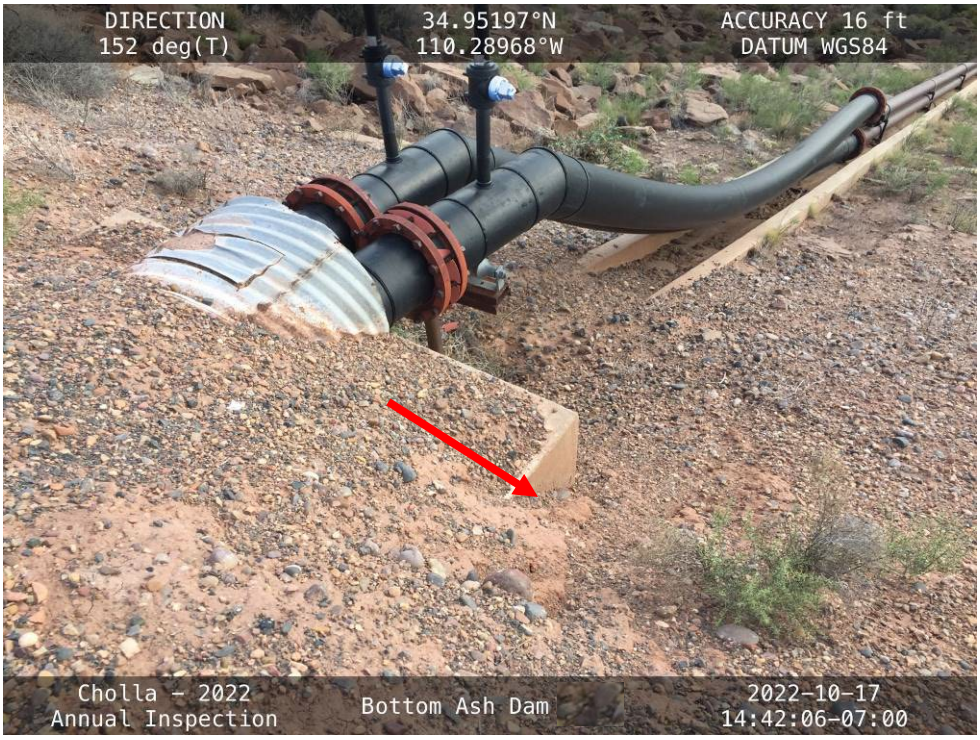
The upstream slope along the eastern half of the South Embankment, facing east.

20221017 – IMG_3591

A hole adjacent to the concrete on the west side of the central siphon line, on the upstream side.

20221017 – IMG_3592
The central siphon lines along the upstream slope of the South Embankment.

20221017 – IMG_3593
The central siphon lines along the downstream slope of the South Embankment.



20221017 – IMG_3594

Minor erosion around the concrete encasement for the central siphon lines.

20221017 – IMG_3599

The upstream slope along the eastern half of the South Embankment and a small bush growing in the crest.

20221017 – IMG_3601
The eastern siphon line along the upstream slope of the South Embankment.

20221017 – IMG_3603
The new flowmeter on the eastern siphon pumpback line.

20221017 – IMG_3607
The eastern siphon line along the downstream slope of the South Embankment.

20221017 – IMG_3609
Vegetation to be removed along the downstream slope of the South Embankment.

20221017 – IMG_3615
The upstream slope at the eastern end of the South Embankment, facing west.

20221017 – IMG_3617
The upstream slope at the southern end of the East Embankment, facing north.

20221017 – IMG_3618
Vegetation to be removed along the upstream slope of the East Embankment.

20221017 – IMG_3619
The crest of the East Embankment, facing north from the southern end.

20221017 – IMG_3625

Area where a 2.5-inch-deep depression was observed along the upstream shoulder of the East Embankment during the 2021 inspection (2021 IMG_7052), not present during this inspection.

20221017 – IMG_3626

The Divider Dike in the reservoir and vegetation on the upstream side of the East Embankment.

20221017 – IMG_3627
An ant hill on the upstream shoulder near Monument PI.

20221017 – IMG_3629
A hole in the crest of the East Embankment, approximately 4 inches deep.

20221017 – IMG_3630
The downstream slope of the southern half of the East Embankment, facing south.

20221017 – IMG_3631
The downstream slope of the northern half of the East Embankment, facing northeast.

20221017 – IMG_3637
The upstream slope of the northern half of the East Embankment, facing northeast.

20221017 – IMG_3639
Erosion rills on the upstream slope of the East Embankment. The ruler is 19 inches long.

20221017 – IMG_3646
Erosion rills on the upstream slope of the East Embankment. The ruler is 13 inches long.

20221017 – IMG_3647
The crest of the East Embankment, facing southwest.

20221017 – IMG_3649
The access road along the downstream slope of the East Embankment, facing south.

20221017 – IMG_3653
The upstream slope of the East Embankment at the Left Abutment, facing south.

20221017 – IMG_3654

A hole in the crest of the East Embankment, approximately 10 inches deep.

20221017 – IMG_3663

An erosion gully on the downstream slope along the northern half of the East Embankment.

20221017 – IMG_3665
An erosion gully on the downstream slope along the northern half of the East Embankment.

20221017 – IMG_3669
The downstream slope along the southern half of the East Embankment, facing south.

20221017 – IMG_3671
Sign identifying allowed and disallowed materials for the Bottom Ash Pond.

20221017 – IMG_3676
The P-226 seepage intercept area with standing water due to recent rain.

20221017 – IMG_3683
Standing water in the ditch adjacent to the Petroglyph Seep due to recent rain.

20221017 – IMG_3685
The downstream slope and toe of the Bottom Ash Dam, facing north from the southeast corner.

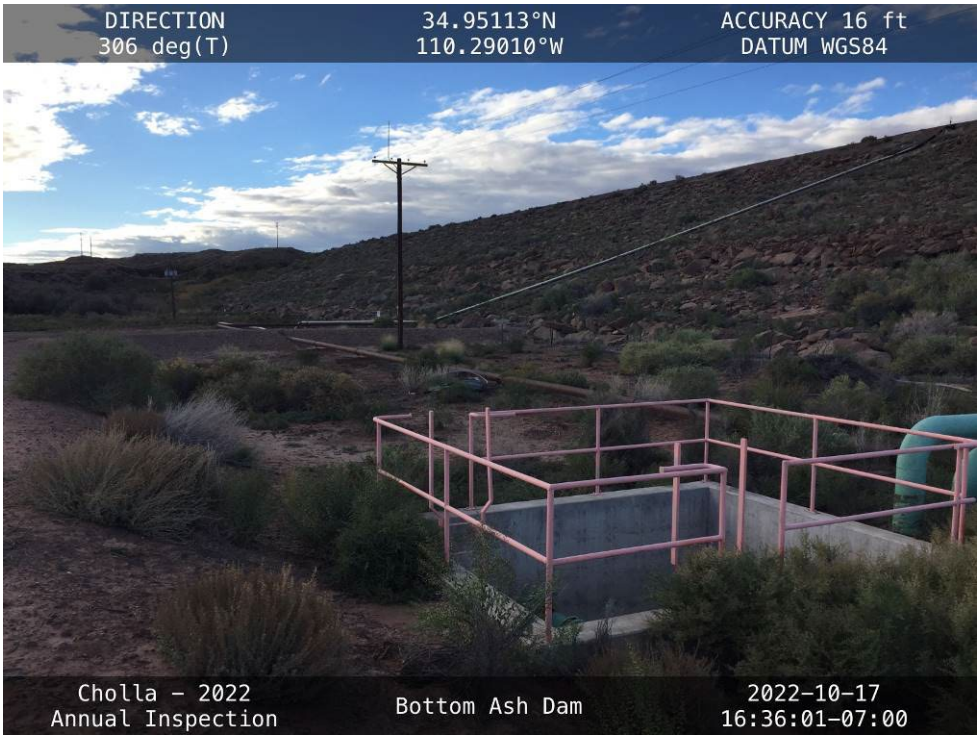
20221017 – IMG_3688
The downstream slope and toe of the Bottom Ash Dam, facing west from the southeast corner.

20221017 – IMG_3692
The West Abutment Weir, flowing at approximately 1.62 gpm.

20221017 – IMG_3694
Grassy vegetation growing in the area near the West Abutment Weir.

20221017 – IMG_3696
The downstream slope of the South Embankment, facing east from the West Abutment Weir.

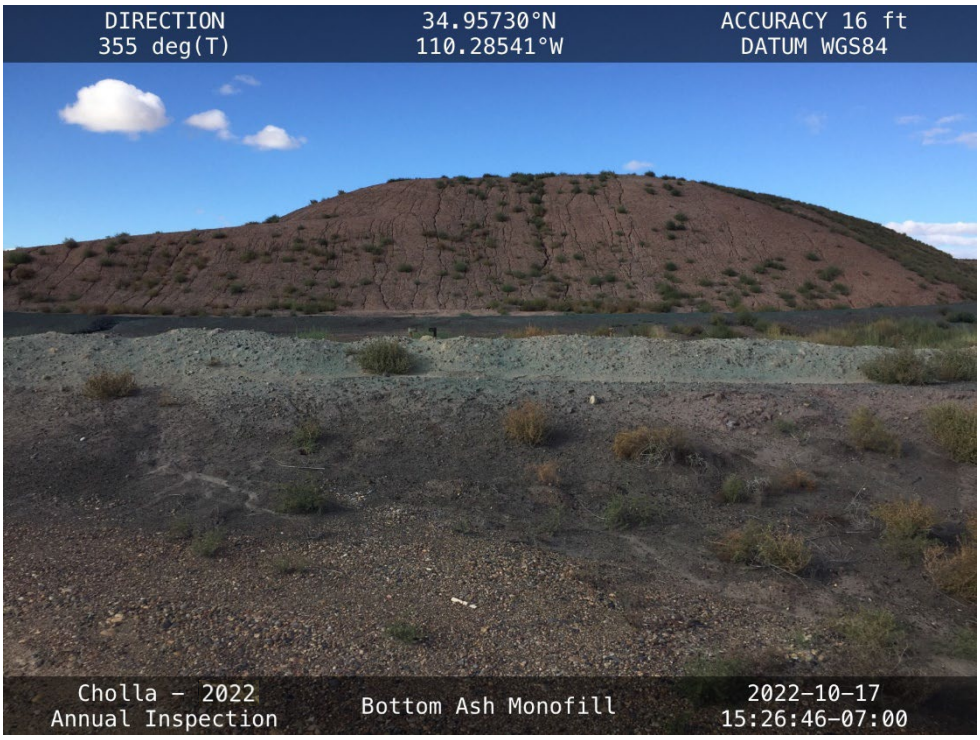
20221017 – IMG_3697
Vegetation to be removed at the toe of the South Embankment.



20221017 – IMG_3698
The downstream slope of the South Embankment, facing west from the toe.

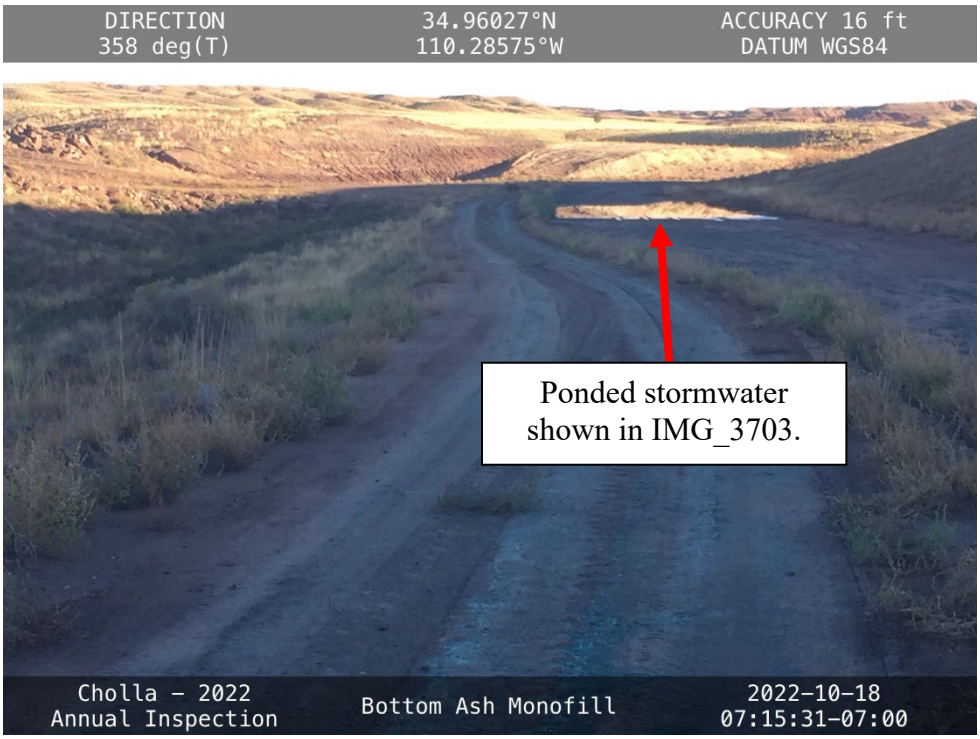
APPENDIX C

BOTTOM ASH MONOFILL PHOTO LOG



20221017 – IMG_3655
The south end of the BAM, facing north from the Bottom Ash Dam.

20221018 – IMG_3703
Ponded stormwater on the west side of the BAM, facing north.



20221018 – IMG_3712

Ponded stormwater on the west side of the BAM and the berm containing it, facing north.

20221018 – IMG_3713

A tunnel on the west side of the western perimeter drainage channel that has formed by erosion.

20221018 – IMG_3714

The head of the tunnel on the west side of the perimeter drainage channel that has formed by erosion.

20221018 – IMG_3717

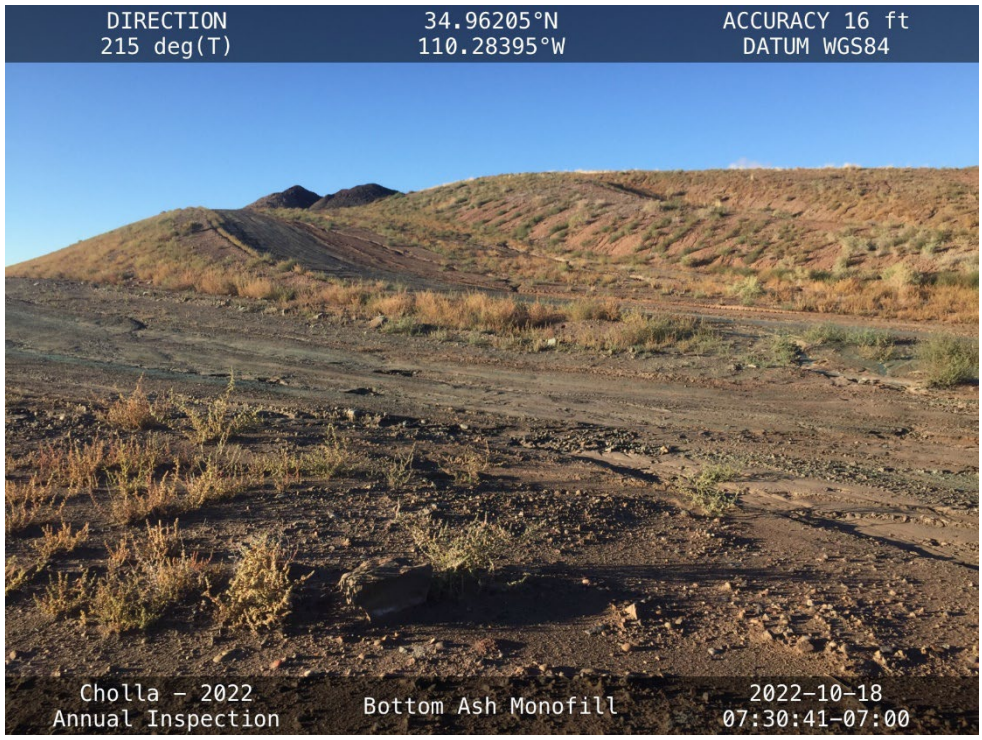
Excessive erosion on the west side of the BAM near the access road to the western stockpile.

20221018 – IMG_3718

The perimeter drainage channel on the west side of the BAM, facing south near the access road to the western stockpile.

20221018 – IMG_3723

Standing water in the perimeter drainage channel on the west side of the BAM, facing north near the access road to the western stockpile.



20221018 – IMG_3726
The north side of the BAM.

20221018 – IMG_3730
An erosion gully at the top and east side of the BAM with sediment at the toe.

20221018 – IMG_3731
An erosion gully and resulting fan deposit on the southeast slope of the BAM.

20221018 – IMG_3732
The Detention Basin at the downstream end of the perimeter drainage channel.

20221018 – IMG_3733
An erosion gully on the eastern slope near the top of the Bottom Ash Monofill, facing east toward the Stormwater Detention Basin.

20221018 – IMG_3737
An erosion gully on the eastern slope near the top of the Bottom Ash Monofill, facing southeast.

20221018 – IMG_3740

Two erosion gullies on the southern access ramp to the top of the Bottom Ash Monofill.

20221018 – IMG_3741

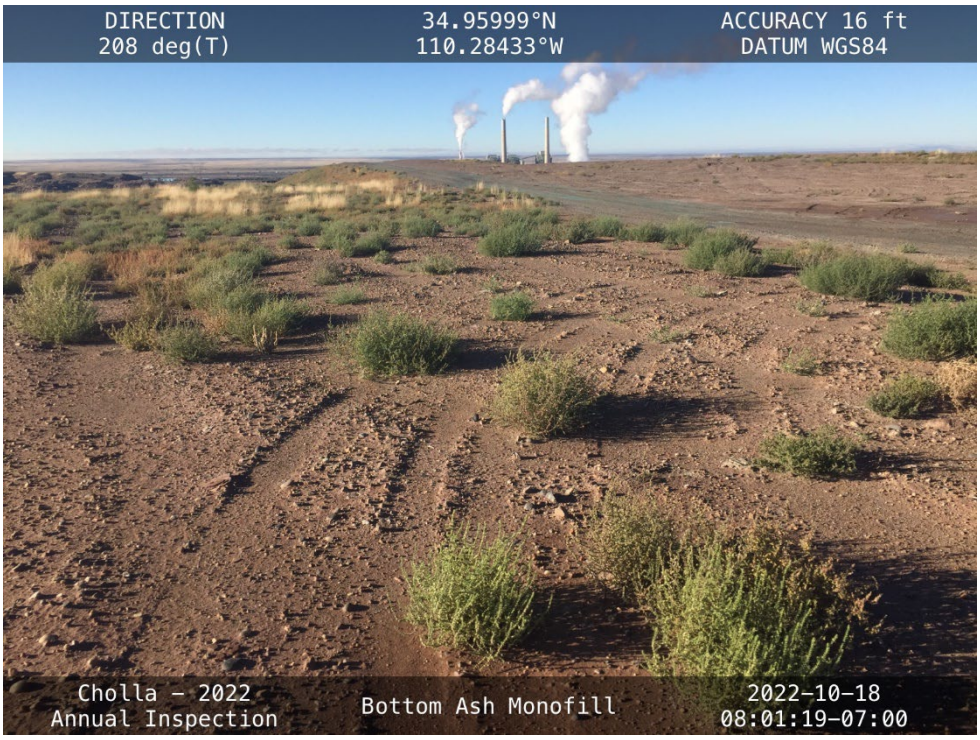
Two erosion gullies on the southern access ramp to the top of the Bottom Ash Monofill.

20221018 – IMG_3745

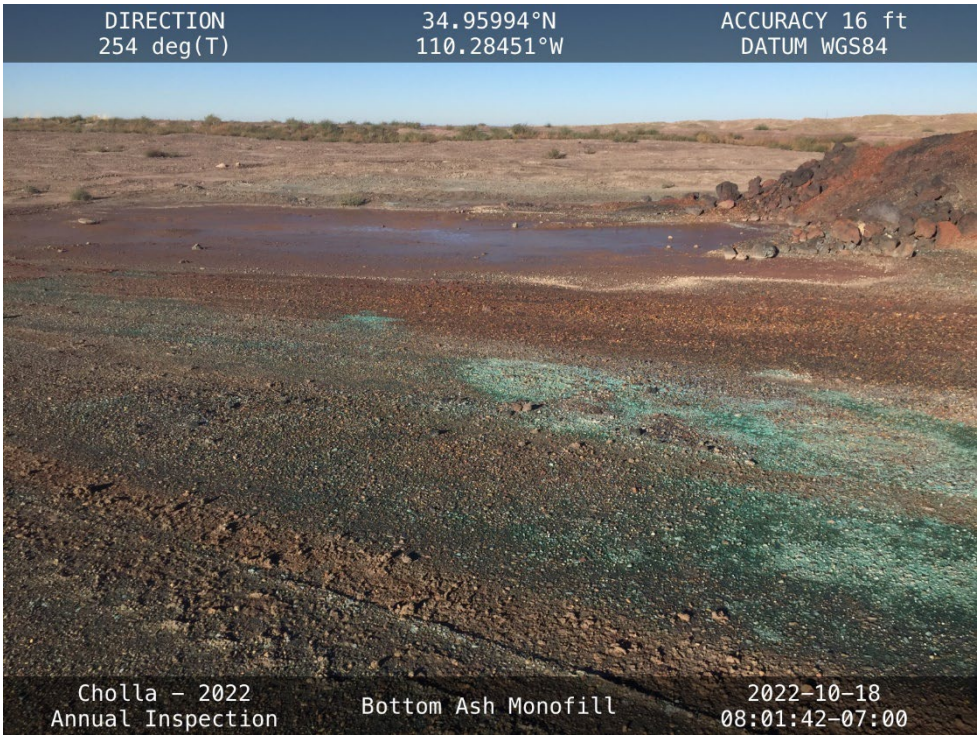
The eastern portion of the Bottom Ash Monofill, facing north from the top of the Monofill.

20221018 – IMG_3757

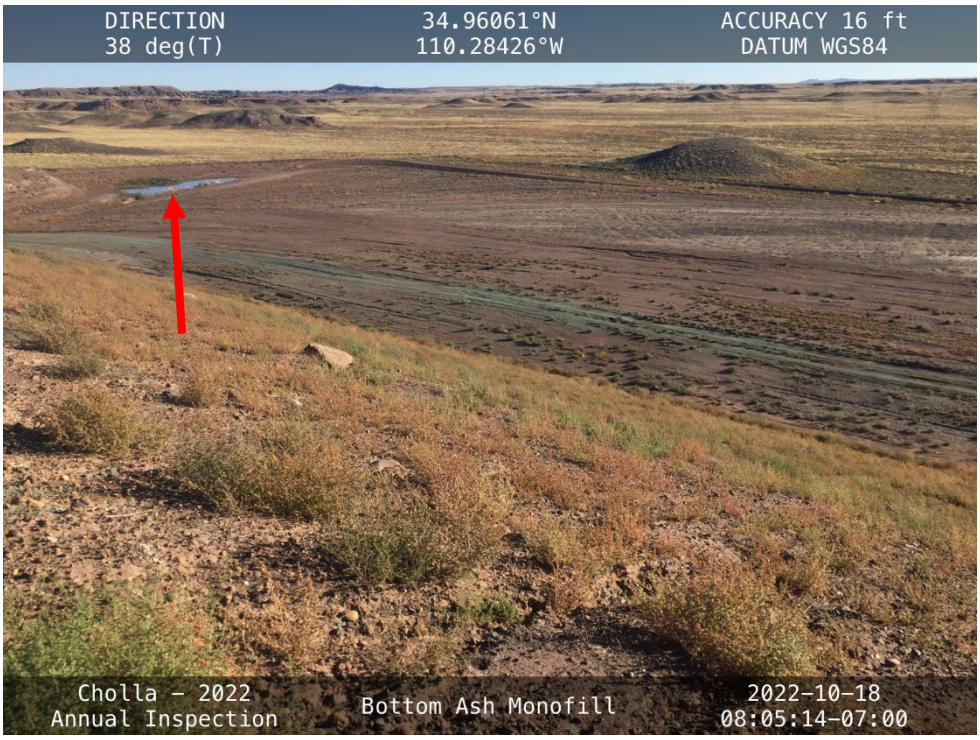
An erosion rill on the eastern slope near the top of the BAM. Slightly deeper compared to 2021.



20221018 – IMG_3758
Cover soil on the surface of the BAM, facing south along the top of the CCR unit.



20221018 – IMG_3763
A low spot in the cover soil on the surface of the BAM with ponded water.



20221018 – IMG_3767
Standing water in the perimeter drainage channel on the north side of the BAM.

20221018 – IMG_3768
Standing water in the perimeter drainage channel on the north side of the Detention Basin.

20221018 – IMG_3769

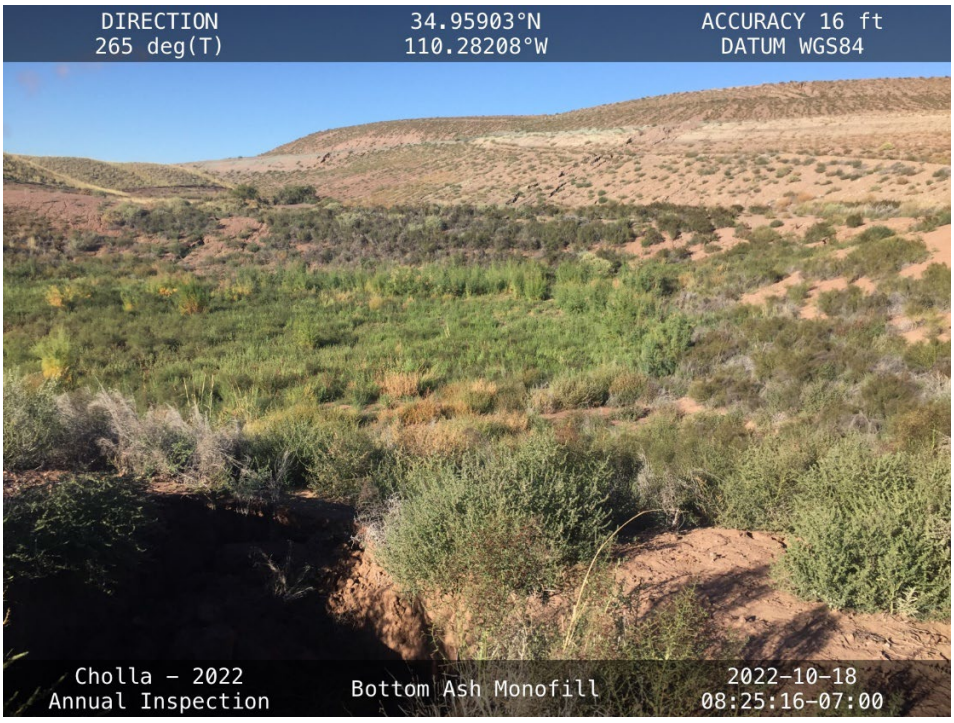
Erosion on the north side of the Stormwater Detention Basin where previous repairs had been made (2021 photo IMG_7248).

20221018 – IMG_3771

Erosion and a tunnel on the north side of the Stormwater Detention Basin where previous repairs had been made.

20221018 – IMG_3776

Erosion on the east side of the Stormwater Detention Basin where previous repairs had been made (2021 photo IMG_7263).



20221018 – IMG_3778

The west side of the Stormwater Detention Basin and the southern end of the BAM, facing west from the east side of the Stormwater Detention Basin.

20221018 – IMG_3781
Eroded material deposited at the toe of the BAM, west of the Stormwater Detention Basin (more deposition at the toe compared to 2021 IMG_7255).

20221018 – IMG_3784
Soil cover eroded and ash exposed in an erosion gully along the southeast side of the BAM.

20221018 – IMG_3791

A low spot on the perimeter road at the top of the deep erosion in IMG_3737 and IMG_3784.

20221018 – IMG_3794

An erosion gully on the southern end of the BAM.