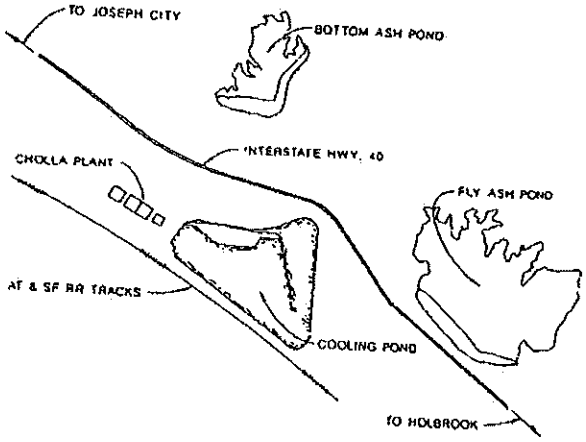
CHOLLA POWER PLANT
Fly Ash Dam, Bottom Ash Dam, and Bottom Ash Monofill

Annual CCR Impoundment and Landfill Inspection Report

2021



aps

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53462
BYRON R.
CONRAD
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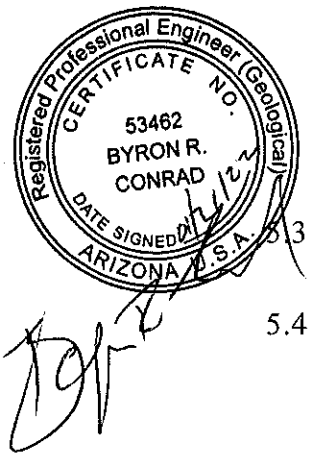

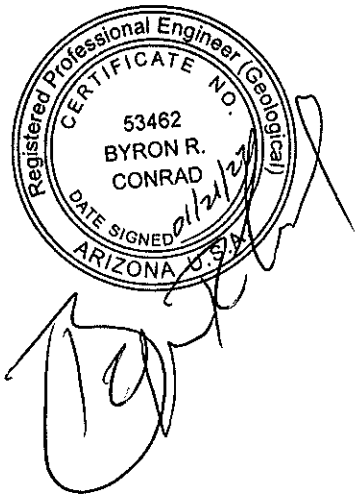

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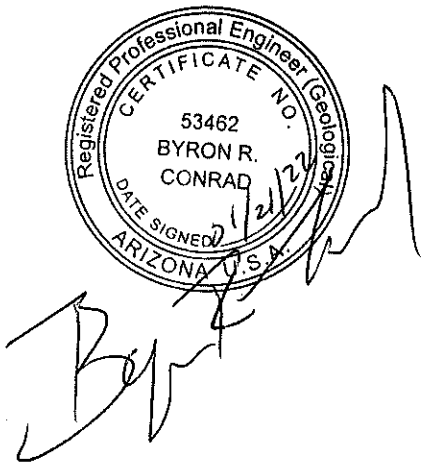

1.0 INTRODUCTION

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, Sedimentation Pond, 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

Byron R. Conrad, P.E.
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Geotechnical Engineer
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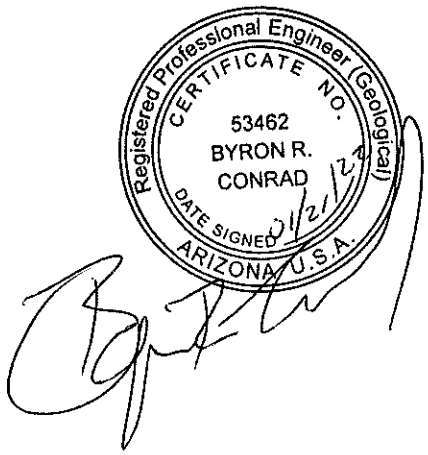

2.0 SITE BACKGROUND AND INSPECTION CONDITIONS

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 25, 2021 and Tuesday, October 26, 2021. Conditions were cool to mild (46-77 degrees Fahrenheit) with moderate winds (20 mph with gusts to 30 mph) and clear skies. Approximately 0.04 inches of rain fell overnight on October 25. Approximately 4.09 inches of precipitation had fallen between October 1, 2020 and September 30, 2021 based on data recorded near Holbrook, Arizona (Weather Underground 2021). 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, simulated 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 (2021) 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 feet. The water level was measured most recently by survey to be at EL 5083.615 feet on November 4, 2021. The water level in the Fly Ash Pond is measured on a monthly basis because the water level gauge is located in an area that has been covered with evaporites and can no longer be read. The monthly water level readings are recorded during the monthly settlement monument survey.

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 5111.2 feet during the inspection on October 25, 2021.

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 SEDIMENTATION POND

The Sedimentation Pond is represented on Figure 3 – Sedimentation Pond Site Map (attached).

The Sedimentation Pond was a holding pond for CCR solids and CCR-impacted surface water that was placed into service in 1976 by constructing an embankment along the southeast and northwest sides. When in service, the Sedimentation Pond consisted of two cells with a maximum depth of 10 feet, a surface area of approximately 1.6 acres, and a nominal total capacity of approximately 10.7 acre-feet.

APS constructed the reinforced concrete Sedimentation Tank (Sedi Tank) within the footprint of the Sedimentation Pond North Cell in 2020, placing it into service on December 23, 2020. The Sedimentation Tank replaced the function of the Sedimentation Pond and allowed the Sedimentation Pond to be decommissioned. APS began removing the Sedimentation Pond from service in May 2021 and completed closure construction on October 8, 2021 using the closure by

removal of CCR method (40 CFR 257.102(c)). Appendix C contains photographs of the finished grade at the closed Sedimentation Pond.

3.4 BOTTOM ASH MONOFILL

The Bottom Ash Monofill is represented on Figure 4 – 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 2021 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 4.4). The Sedimentation Pond, formerly included in the annual inspections, is no longer a functioning CCR unit and the inspection text has been replaced with a description of the closure construction in 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): Byron Conrad, P.E. (APS)</td><td colspan="2">Report Date: January 17 2022</td></tr>
<tr><td colspan="2">Inspected by: Byron Conrad, P.E. (APS)
Lee Wright, P.E. (AECOM)</td><td colspan="2">Inspection Date: October 25, 2021</td></tr>
<tr><td colspan="2">Reviewed by: Byron Conrad, P.E. (APS)</td><td colspan="2">Review Date: January 12, 2022</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): 36.39
(November 4, 2021)</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 5083.615
(November 4, 2021)</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 5095.4 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: **03/2017**	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 2022**								

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 2021 (for 2020)**	Should new readings be taken and new report provided? **Annual reporting is required.**				**X**			

DAM EMBANKMENT CHECKLIST									
3	***DAM CREST***								
a	Settlements, slides, depressions?				**X**				
b	Misalignment?				**X**				
c	Longitudinal/Transverse cracking?	**None observed. See comment ii.**			**X**		**X**		
d	Animal burrows?	**Ant hills were observed at various locations across the crest (Photos IMG_6783 and IMG_6815).**				**X**	**X**		
e	Adverse vegetation?				**X**				
f	Erosion?				**X**				
4	***UPSTREAM SLOPE***								
a	Erosion?	**Minor erosion and soil wasting observed along the upstream slope. 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?	**No deep erosion (greater than 1 foot deep) observed. Some shallow erosion observed on the ramp near the Geronimo Sump (Photo IMG_6869). Continue to monitor.**		**X**		**X**		
b	Inadequate ground cover?			**X**				
c	Adverse vegetation?	**Continue removing adverse 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	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?	**No significant erosion (greater than 1 foot deep) observed. 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. The areas were observed to be dry during this inspection.**		**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 C and D were inspected and the water appeared clear. Sumps A and B were not running at the time of the inspection.**		**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. The water level 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. 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.

   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 piezometers F-91R, F-92R, F-111R, and well W-123R, respectively. Additional information is provided in Section 5.1.2.

ii. The shallow (up to 2-inches deep), discontinuous, longitudinal crack observed spanning a length of 20 feet along the upstream half of the crest near settlement monument M-5B during the 2020 inspection was not observed during this inspection (Photo IMG_6796). The area should be monitored during weekly inspections in the event the crack reappears.

   The 6-foot-long crack observed in the wider portion of the upstream shoulder south of Piezometer F-124 during the 2020 inspection was not observed during this inspection (Photo IMG_6787). This crack was near areas of minor erosion on the upstream slope and is in part of the dam crest that was widened in early 2000 to accommodate piezometer installation activities. The area should be monitored during weekly inspections in the event the crack reappears.

iii. Minor erosion was observed along the upstream slope near the piezometers screened in the dam core (Photos IMG_6786, IMG_6787, IMG_6793, and IMG_6794). The eroded portion was observed to be slightly wider during this inspection compared to the 2020 inspection (comparing 2020 Photo IMG_2344 with 2021 Photo IMG_6793) and the erosion locations appeared more numerous compared to the 2020 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 in the extended portion and is not affecting the original crest.

iv. Minor stone deterioration was also observed 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) after observing they were operating inconsistently, had relatively low extraction rates, and erratic water levels (Wood 2021) (Photo IMG_6882). The well pump replacement coincided with the abandonment and replacement of the piezometers and wells described in comment i.

APS monitors the turbidity at the Geronimo Sump and observed the turbidity during 2021 (1.86 NTU average) was generally higher than the turbidity observed during 2020 (0.51 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 relatively drier during this inspection than it was during previous inspections (Photos IMG_6927 and IMG_6928).

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

vii. The weekly inspection reports for the period between October 1, 2020 and September 30, 2021 were reviewed and indicate the following:

   a. Seepage at the abutment contacts was noted as requiring monitoring throughout the year. APS monitors seepage on a regular basis and did not record any adverse seepage conditions during the review period.

viii. The weekly inspection reports for the period between October 1, 2020 and September 30, 2021 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

Bottom Ash Dam		State Identification Number (SID): **09.27**						
SID: **09.27**	Dam Name: **Bottom Ash Dam**	Type: **Earth**	Purpose: **Bottom ash containment**	Not Applicable	No	Yes	Monitor	Repair	Investigate
Contact(s): **Byron Conrad, P.E. (APS)**		Report Date: **January 17, 2022**							
Inspected by: **Byron Conrad, P.E. (APS), Lee Wright, P.E. (AECOM)**		Inspection Date: **October 25, 2021**							
Reviewed by: **Byron Conrad, P.E. (APS)**		Review Date: **January 12 2022**							
Design Dam Crest Elevation (ft): **5,123.3**		Design Spillway Crest Elevation: **None**							
Design Total Freeboard (ft): **5.5**		Measured Total Freeboard (ft): **12.1**							
Statutory Dam Height (ft): **73**		Structural Height (ft): **73**							
Dam Crest Length (ft): **4,040**		Upstream Slope: **3:1**	Downstream Slope: **3:1**						
Dam Crest Width (ft): **12**		Lat: **34° 57' 07.0" N**	Water Rights: **N/A**						
		Long: **110° 17' 22.7" W**							
Reservoir Area (acres): **80**		Reservoir Storage (ac-ft): **2,300**							
Inflow Design Flood/Safe Flood-Passing Capacity: **PMF – fully contained.**									
Reservoir Level During Inspection (ft): **5111.20**		Photos: **Yes. See Appendix B.**	Pages: **5**						
Estimated Solids Level (ft): **Varies – approx. EL 5115 feet**									

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: **03/2017**	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 2022**								

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? **Yes.**	Describe: **See comment i.**				**X**			
c	Date of last report: **January 2021 (for 2020)**	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 (Photos IMG_6987 and IMG_7062).**					**X**	**X**		
e	Adverse vegetation?				**X**				
f	Erosion? **See comment iv.**					**X**	**X**		
4	***UPSTREAM SLOPE***								
a	Erosion? **Minor erosion near the crest observed. 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_6976) and near the central siphon line (Photo IMG_7016).**					**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_7120 and IMG_7127).**			**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_7173 and IMG_7181) while the woody vegetation remains absent. Continue to monitor the area and remove vegetation in accordance with the NMOSE (2011) guidance.**			**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?	**At least one animal burrow was observed along the downstream slope of the East Embankment (Photo IMG_7117). Continue to monitor.**				**X**	**X**		
6	***ABUTMENT CONTACTS***								
a	Erosion?	**There is erosion in the downstream groin of the Right Abutment (Photo IMG_6972). The erosion is deeper than 1 foot in some sections and should be repaired by placing erosion protection in the eroded section.**				**X**		**X**	
b	Differential movement?				**X**				
c	Cracks?				**X**				
d	Settlements, slides, depressions, bulges?				**X**				
e	Seepage?	**Yes. Measured approximately 1.5 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.**							
b	Internal drains flowing?					**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. 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. APS reported that the pumpback flowmeter at the eastern siphon is broken. APS has observed water running through the pipe, but the flowmeter continues to show the same reading. The flowmeter should be replaced.

ii. There is a 2.5-inch-deep depression along the upstream shoulder of the East Embankment (Photo IMG_7052). The depression is oriented perpendicular to the crest and is wider than it is deep. The depression should be monitored and repaired if it exceeds 1 foot in depth or if it begins to get progressively wider or deeper.

Some erosion holes observed on the crest or shoulder during the 2020 inspection were not observed during this inspection (Photos IMG_7045, IMG_7054, and IMG_7083). Several new erosion holes were observed along the crest and shoulders (Photos IMG_7053, IMG_7064, IMG_7073, IMG_7082, IMG_7093, IMG_7095, IMG_7097, IMG_7098, and IMG_7099).

iii. The crack in the support material on the downstream side of settlement monument M-13 appears to be unchanged compared to the 2020 inspection (Photo IMG_7006). The 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_6998, IMG_7010), soil wasting (Photo IMG_7118), and erosion gullies (Photos IMG_7120 and IMG_7127) 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_7036, IMG_7060, and IMG_7075). The new rills were generally less than 13 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-232 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), no water was present in the Petroglyph sump, and the Tanner Wash sump was running.

vi. The weekly inspection reports for the period between October 1, 2020 and September 30, 2021 were reviewed and indicate the following:

   a. Erosion at the abutment contacts was noted as requiring monitoring throughout the year.

   b. Seepage at the abutment contacts was noted as requiring monitoring throughout the year. APS monitors seepage on a regular basis and did not record any adverse seepage conditions during the review period.

vii. The weekly inspection reports for the period between October 1, 2020 and September 30, 2021 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 – SEDIMENTATION POND

APS began removing the Sedimentation Pond from service in May 2021 and completed construction on October 8, 2021 using the closure by removal of CCR method (40 CFR 257.102(c)). As part of this process, APS made the following modifications to the Sedimentation Pond and ancillary structures:

- The pipes that formerly drained into the Sedimentation Pond were rerouted to the new Sedi Tank or to the bottom ash sluice water side of the general water tank.

- The ancillary concrete structures associated with the Sedimentation Pond were decontaminated by removing adhered CCR material. The ancillary concrete structures were then removed and placed in the inert landfill.

- APS removed the CCR that had been deposited in the Sedimentation Pond and removed the underlying native soils in the Sedimentation Pond to a depth no shallower than EL 5008.23 feet (NAVD88; approximate EL 5005.66 feet NGVD29). Based on the September 1975 as-built drawing for the Sedimentation Pond (APS Drawing #G-44573), the bottom of the pond was to be at EL 5007.00 feet (NGVD29). The CCR and CCR-impacted soil was placed in the Bottom Ash Monofill.

- The soil at the bottom of the overexcavation was observed to be native soil (reddish brown lean clay with sand) with no distinguishable CCR.

- APS placed structural fill in the Sedimentation Pond footprint to bring the site to the surrounding grade.

- As a result of the closure by removal of CCR, the Sedimentation Pond no longer functions as a CCR unit and was not inspected as part of this report. Appendix C contains photographs of the finished grade at the closed Sedimentation Pond.

4.4 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="11">Not Applicable</td><td rowspan="11">No</td><td rowspan="11">Yes</td><td rowspan="11">Monitor</td><td rowspan="11">Repair</td><td rowspan="11">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): Byron Conrad, P.E. (APS)</td><td colspan="2">Report Date: January 17, 2022</td></tr>
<tr><td colspan="2">Inspected by: Byron Conrad, P.E. (APS), Lee Wright, P.E. (AECOM)</td><td colspan="2">Inspection Date: October 25-26, 2021</td></tr>
<tr><td colspan="2">Reviewed by: Byron Conrad, P.E. (APS)</td><td colspan="2">Review Date: January 12, 2022</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 D.</td><td colspan="2">Pages: 2</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 2021 (for 2020)**	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?					**X**			
d	Run off control?					**X**			
e	Erosion?	**See comment ii.**			**X**		**X**		
f	Dust control issues?	**See comment iii.**				**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 2021. Some CCR-impacted materials (including material removed from the Sedimentation Pond – Section 4.3) were placed in the Bottom Ash Monofill in 2021, but were small volumes compared to the typical annual placement volumes (approximately 150,000 cubic yards per year).

ii. Shallow erosion rills were observed throughout the CCR unit (see Appendix D). In addition, new erosion and headcutting was observed in locations of historic erosion at the Stormwater Detention Basin as deep as 4.5 feet (Photos IMG_7248, IMG_7251, and IMG_7263). Continue to monitor these areas and repair erosion where the eroded depth exceeds 1 foot.

One location along the eastern toe of the Bottom Ash Monofill, west of the Stormwater Detention Basin, has experienced significant erosion, resulting in localized eroded depths up to 2 feet (Photo IMG_7255). CCR has eroded off the slope and has been deposited in the form of an alluvial fan. This area should be repaired.

A second location near the south end of the Bottom Ash Monofill has an erosion gully several feet deep (Photo IMG_7229). This area should be repaired.

iii. During the inspection, a loader was observed generating dust as it was operating on top of the Bottom Ash Monofill (Photo IMG_7241). Although very little material is currently being placed in the unit, dust generation should be minimized.

iv. The weekly inspection reports for the period between October 1, 2020 and September 30, 2021 were reviewed and 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 2020.

5.1.2 Instrumentation

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

The minimum and maximum recorded readings for each instrument over the October 1, 2020 – September 30, 2021 (current) review period are reported in the following table:

Instrument Name	Minimum	Maximum	Unit
Open Standpipe Piezometers (10/1/20 to 9/30/21)			
F-81	5058.17	5059.07	EL (ft)
F-88	5000.94	5003.30	EL (ft)
F-89	5048.62	5054.25	EL (ft)
F-90	4993.55	4995.96	EL (ft)
F-91[1]	5006.06	5007.14	EL (ft)
F-91R[1]	4996.05	4997.19	EL (ft)
F-92[1]	5011.49	5012.45	EL (ft)
F-92R[1]	5013.02	5013.31	EL (ft)
F-93	5017.25	5017.61	EL (ft)
F-100	5076.36	5077.41	EL (ft)
F-101	5047.50	5048.65	EL (ft)
F-102	5024.74	5025.40	EL (ft)
F-103	5016.73	5018.00	EL (ft)
F-104	5062.91	5063.46	EL (ft)
F-105	5079.88	5082.03	EL (ft)
F-106	5014.41	5015.41	EL (ft)
F-107	5024.37	5025.63	EL (ft)
F-108	5054.62	5056.69	EL (ft)
F-109	5033.97	5034.53	EL (ft)
F-110	5087.01	5088.78	EL (ft)
F-111[1]	5030.07	5030.66	EL (ft)
F-111R[1]	5012.24	5013.02	EL (ft)
F-112	5027.14	5027.68	EL (ft)
F-113	5042.35	5043.25	EL (ft)

Instrument Name	Minimum	Maximum	Unit
F-114	5024.83	5025.73	EL (ft)
F-115	5033.17	5033.79	EL (ft)
F-117	5082.64	5084.26	EL (ft)
F-123	5083.61	5084.30	EL (ft)
F-124	5085.06	5085.78	EL (ft)
F-125	Dry	Dry	EL (ft)
F-126	5077.25	5080.31	EL (ft)
F-127	5071.24	5078.41	EL (ft)
F-128	5088.90	5089.36	EL (ft)
F-129	5081.32	5093.86	EL (ft)
F-130	5075.38	5078.05	EL (ft)
F-131	5057.19	5059.07	EL (ft)
F-132	5084.92	5085.53	EL (ft)
F-133	5076.29	5082.80	EL (ft)
F-134	5062.20	5064.05	EL (ft)
W-123[1]	5036.57	5036.98	EL (ft)
W-123R[1]	5034.90	5035.18	EL (ft)
Settlement Monuments (10/1/20 to 9/30/21)			
M-1	5120.904	5121.021	EL (ft)
M-2	5120.399	5120.485	EL (ft)
M-3	5119.785	5119.891	EL (ft)
M-4	5118.946	5119.063	EL (ft)
M-5	5117.918	5117.996	EL (ft)
M-5A	5117.741	5117.829	EL (ft)
M-5B	5117.544	5117.613	EL (ft)
M-5C	5117.845	5117.932	EL (ft)
M-6	5118.976	5119.064	EL (ft)
M-6A	5118.620	5118.707	EL (ft)
M-6B	5119.632	5119.744	EL (ft)
M-6C	5119.996	5120.072	EL (ft)
M-7	5119.449	5119.532	EL (ft)
M-8	5119.556	5119.634	EL (ft)
M-9	5119.965	5120.052	EL (ft)
M-10	5119.941	5120.018	EL (ft)

Instrument Name	Minimum	Maximum	Unit
Totalizers (10/1/20 to 9/30/21)			
Geronimo	0.00	6.40	gpm
Hunt	0.00	9.44	gpm

1) Piezometer was abandoned and replaced in May 2021. The "R" suffix designates the name assigned to the nearby replacement well.

The data for the piezometers during the current review period indicate that the water levels recorded in formations hydraulically connected to the reservoir are generally declining along with the reservoir water level; however, the water levels in piezometers F-110 (screened in the alluvium underlying the dam) and F-128 (screened in the core of the dam) have decreased compared to prior years, but remain higher than the current reservoir water level. In addition, the water levels in piezometers F-124 and F-132 (both screened in the core of the dam), have not decreased as quickly as the reservoir level has decreased and are slightly above the elevation of the reservoir. Similar to piezometers F-124 and F-132, the water level in piezometer F-123 also has not decreased as quickly as the reservoir level and is slightly below the impounded water elevation. 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.

In May 2021, APS abandoned and replaced several piezometers, extraction wells, and monitoring wells associated with the Fly Ash Pond. The four CCR monitoring instruments – F-91, F-92, F-111, and W-123 – that were replaced are described as follows:

- Piezometer F-91R was installed to replace piezometer F-91 in the Wupatki Formation. APS believed that piezometer F-91 had a faulty seal as aquifer tests performed in extraction wells that had been installed in alluvium resulted in water level drawdown at F-91 (Wood 2021). The water elevations measured in piezometer F-91R during the second half of 2021 were approximately 10 feet lower than the 2020-2021 water elevations measured in piezometer F-91. The measurements at piezometer F-91R indicate similar water elevations when compared to measurements at piezometer F-90.

- Piezometer F-92R was installed to replace piezometer F-92 in the alluvium. Piezometer F-92 was observed to be blocked at a depth of approximately 23 feet below ground surface (bgs). In addition, APS believed piezometer F-92 may have been screened across the contact between the Moqui member of the Moenkopi Formation and the overlying alluvium. Piezometer F-92R is screened only in the alluvium (Wood 2021). The water elevations measured in piezometer F-92R during the second half of 2021 indicate similar water elevations when compared to historic measurements at piezometer F-92.

- Piezometer F-111R was installed to replace piezometer F-111 in the alluvium. The water level in piezometer F-111 had not responded to recent aquifer tests in newly-installed extraction wells at the Geronimo Seep (where F-111 was installed) and APS suspected F-111 was either damaged or had been clogged (Wood 2021). The water elevations measured in piezometer F-111R during the second half of 2021 was approximately 17 feet to 18 feet

lower than the historic average water elevation in piezometer F-111 prior to its abandonment.

- Well W-123R was installed to replace well W-123 in the alluvium. APS believed that well W-123 was screened across the Moqui member of the Moenkopi Formation and the overlying alluvium. Well W-123R is screened only in the alluvium (Wood 2021). The water elevations measured in well W-123R during the second half of 2021 was approximately 1.5 feet to 2 feet lower than the typical water elevation measured in well W-123 prior to its abandonment.

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 during the current review period indicate no significant changes or trends related to the performance of the dam.

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, 2020 – September 30, 2021 timeframe) is presented in the following table:

Water	Depth of Water (ft) (calculated)	Water Elevation (ft) (surveyed)	Measurement Location
Minimum	13.633	5083.633 (9/8/2021)	Northeast Area of Pond
Maximum	16.449	5086.449 (6/17/2021)	Northeast Area of Pond
Present (this inspection)	13.615	5083.615 (11/4/2021)	Northeast Area of Pond
CCR	**Depth of CCR (ft) (calculated)**	**CCR Elevation (ft) (estimated)**	**Measurement Location**
Minimum	56.4	~5095.4 (2020 inspection)	Inlet Pipe
Maximum	56.4	~5095.4 (2021 inspection)	Inlet Pipe
Present (this inspection)	56.4	~5095.4 (2021 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 appeared to be practically the same during the 2021 inspection when compared to the 2020 inspection.

Reported water depths are calculated relative to the estimated lowest elevation (approximately EL 5070 feet) of the intersection of the upstream edge of the impounded fly ash with natural ground, based on the 2015 bathymetric survey. Reported CCR depths are calculated relative to the estimated lowest elevation (approximately EL 5040 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 estimated storage capacity of the CCR unit at the time of the inspection was 18,000 acre-feet (ac-ft).

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 6,476 ac-ft. This reduction compared to the estimated volume during the 2020 inspection is due to the reduction in water impounded in the reservoir and an adjustment to how this value is calculated, which includes the 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.

There are no significant changes to the structural integrity or operation of the dam since the 2020 inspection. APS is in the process of relocating approximately 700,000 cubic yards (434 ac-ft) of CCR from Ash Pond 1 to the Fly Ash Pond reservoir. The relocation was nearly complete at the time of the inspection.

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 2020.

5.2.2 Instrumentation

The locations of geotechnical and other related instrumentation in the vicinity of the Bottom Ash Dam are shown on Figure 6 – Bottom Ash Dam Instrumentation Map.

The minimum and maximum recorded readings for each instrument over the October 1, 2020 – September 30, 2021 (current) review period are reported in the following table. Due to logistical issues related to COVID-19 prior to the submittal of the 2020 CCR Inspection Report, APS was unable to provide data for the settlement monuments during the 10/1/19 to 9/30/20 review period. The maximum and minimum values for these instruments are included in the following table.

Instrument Name	Minimum	Maximum	Unit
Open Standpipe Piezometers (10/1/20 to 9/30/21)			
B-200	5046.16	5048.99	EL (ft)
B-201	5042.97	5045.25	EL (ft)
B-202	5039.64	5041.46	EL (ft)
B-204	5096.32	5100.10	EL (ft)
B-206	5027.79	5029.00	EL (ft)
B-207	5030.35	5031.67	EL (ft)
B-208B	Dry	Dry	EL (ft)
B-209	5071.40	5072.98	EL (ft)
B-210	5065.82	5067.23	EL (ft)
B-211	Dry	Dry	EL (ft)
B-212	5089.22	5091.83	EL (ft)
B-213	5078.75	5080.59	EL (ft)
B-214	5077.87	5079.60	EL (ft)
B-215	5077.47	5079.14	EL (ft)
B-216	5070.03	5071.71	EL (ft)
B-217	5093.72	5100.04	EL (ft)
B-218	5093.02	5094.56	EL (ft)
B-225	5058.40	5059.45	EL (ft)
W-227	5089.88	5092.02	EL (ft)
Settlement Monuments (10/1/19 to 9/30/20)			
M-11	5123.278	5123.377	EL (ft)
M-12	5122.780	5122.842	EL (ft)
M-13	5122.645	5122.780	EL (ft)

Instrument Name	Minimum	Maximum	Unit
M-14	5119.333	5119.446	EL (ft)
M-15	5122.965	5123.051	EL (ft)
M-16	5123.449	5123.572	EL (ft)
M-17	5122.942	5123.046	EL (ft)
M-18	5123.205	5123.340	EL (ft)
M-19	5123.343	5123.477	EL (ft)
PI	5123.389	5123.522	EL (ft)
Settlement Monuments (10/1/20 to 9/30/21)			
M-11	5123.263	5123.335	EL (ft)
M-12	5122.729	5122.807	EL (ft)
M-13	5122.620	5122.720	EL (ft)
M-14	5119.335	5119.440	EL (ft)
M-15	5122.957	5123.032	EL (ft)
M-16	5123.448	5123.539	EL (ft)
M-17	5122.923	5123.023	EL (ft)
M-18	5123.222	5123.300	EL (ft)
M-19	5123.363	5123.436	EL (ft)
PI	5123.379	5123.469	EL (ft)
Totalizers (10/1/20 to 9/30/21)			
West Abutment Totalizer	2.71	6.83	gpm
West Abutment Weir	0.54	2.00	gpm
P-226	16.40	31.13	gpm
Tanner Wash Totalizer	3.46	17.04	gpm
Petroglyph	2.05	3.29	gpm

The water level in piezometer B-217 decreased approximately 5.5 feet starting in November 2020 and remained low until October 2021. APS does not consider the water level decrease to be abnormal since it generally coincided with an 8-foot decrease in the reservoir level and the subsequent recovery in B-217 coincided with an increase in the reservoir water elevation. Previous changes in the reservoir water elevation had not produced similarly drastic water level decreases in piezometer B-217, nor has the water level in piezometer B-217 been lower than it was in late 2020 through the first half of 2021. APS will continue to monitor B-217 and the other instruments for indications of significant changes or trends related to the performance of the dam. The data for the remaining 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 (10/1/20 to 9/30/21) indicate no significant elevation changes or trends related to the performance of the dam. The data for the settlement monuments during the 10/1/19 to 9/30/20 review period also 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. As the Bottom Ash Pond water elevation was generally lower in 2021 compared to 2020, the totalizer flowrates are also slightly lower during this review period when compared to the October 1, 2019 – September 30, 2020 review period.

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	5.5	5105.5 (11/10/2020)	Upstream slope at the staff gauge
Maximum	13.7	5113.7 (8/17-19/2021)	Upstream slope at the staff gauge
Present (this inspection)	11.2	5111.2 (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 excavate ash in 2021.

5.2.4 Storage Capacity

The estimated storage capacity of the CCR unit at the time of the inspection was 2,300 ac-ft.

5.2.5 Approximate Impounded Volume at Time of Inspection

The approximate volume of impounded water and CCR at the time of the inspection was 1,936 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 2020 inspection.

5.3 SEDIMENTATION POND

5.3.1 Geometry Changes Since Last Inspection

APS removed the Sedimentation Pond from service removing ancillary structures, CCR, and CCR-impacted soil in accordance with 40 C.F.R. 102(c) (closure by removal of CCR). The portion of the Sedimentation Pond outside the footprint of the new Sedimentation Tank was backfilled with clean soil obtained from on-site borrow sources. The backfill activities brought the ground up to the grade surrounding the site. A drainage swale was constructed to direct run-on into the drainage ditch along the south side of the former Sedimentation Pond footprint. Consequently, the Sedimentation Pond no longer functions as a CCR unit.

5.4 BOTTOM ASH MONOFILL

5.4.1 Geometry Changes Since Last Inspection

There have not been any significant changes to the geometry of the embankments since the last inspection in 2020. APS did not move any ash from the Bottom Ash Pond into the Bottom Ash Monofill in 2021.

5.4.2 Instrumentation

There are no instruments associated with the Bottom Ash Monofill.

5.4.3 CCR Volume

Based on the planned fill rate and the volume of CCR excavated from the Sedimentation Pond, the CCR unit is estimated to contain approximately 1,107.6 ac-ft at the time of the inspection. The estimated maximum storage capacity is 2,417 ac-ft.

5.4.4 Structural Weakness or Operational Change/Disruption

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

Areas of historic erosion, including erosion in the Stormwater Detention Basin observed during previous inspections that have been repaired, are beginning to erode again. In addition, new erosion locations were observed during this inspection (Appendix D). The additional erosion was not observed to be detrimental to the operation of the CCR unit, but should be monitored and repaired if it is deeper than 1 foot. 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.

There are no significant changes to the structural integrity or operation of the impoundment since the 2020 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.	1) Mark ant hills and animal burrows identified during weekly inspections. 2) Continue remediating identified ant hills and animal burrows. NOTE: This will always be an ongoing maintenance activity.
2) Continue monitoring the groin of the Right Abutment and the access road near the Geronimo sumps for erosion.	Repair the erosion at the Right Abutment and continue to repair other areas if 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) 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.

6.1.2 Previous Fly Ash Dam Action Items

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

Action Item and First Instance of Observation	Resolution
1) 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 inspection. Continue to monitor the area for reappearance.
2) 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 inspection. Continue to monitor the area for reappearance.
3) 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.
4) The recorded water levels in Piezometers F-110 and F-128 are above the elevation of the Fly Ash Pond (2018 inspection).	APS does not consider the phreatic levels in these instruments to be an adverse condition affecting the operation of the Fly Ash Dam because the presence of the beach along the upstream face acts as a buttress against the slope.
5) Re-establish the water level gauge in the reservoir or establish a new alternative means of regularly recording reservoir levels (2016 inspection).	The Fly Ash Pond water level is read on a 30-day interval when the settlement monuments are surveyed.
6) The above-ground portion of the pipe at Geronimo Well Pump D is leaking (2016 inspection).	The leak was repaired.
7) Update the Emergency Action Plan (2016 inspection).	The Emergency Action Plan was updated in March 2017.

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.	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.
2) Monitor the erosion gullies at the downstream slope of the East Embankment.	Repair erosion since it has exceeded 1 foot in depth.
3) Continue identifying and remediating scattered animal burrows and ant hills.	1) Mark ant hills and animal burrows identified during weekly inspections. 2) Continue remediating identified ant hills and animal burrows. NOTE: This will always be an ongoing maintenance activity.
4) 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.
5) Continue monitoring the riprap for additional signs of deterioration.	Replace riprap as needed.
6) 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.
7) The pumpback flowmeter at the eastern siphon line is broken.	Replace the pumpback flowmeter at the eastern siphon line
8) Continue to monitor seepage areas 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 previous inspections and have been addressed.

Action Item and First Instance of Observation	Resolution
1) Shallow erosion was identified in two places along the upstream slope, including around the siphon line encasements (2018 inspection).	The erosion was repaired.
2) Remove vegetation and debris from the V-notch weir at the West Abutment (2018 inspection).	The vegetation was removed; however, the presence of water in this area is expected to result in ongoing vegetative growth.
3) The flowrate recorded at the P-226 totalizer increased sharply between September and December 2018 (2018 inspection).	The increased flowrate was not associated with abnormal occurrences or adverse conditions associated with dam safety. The high flow rate (147.82 gpm) was neither sustained nor repeated after 2018. APS believes the high flowrate may have been due to a flowmeter error.
4) Update the Emergency Action Plan (2016 inspection).	The Emergency Action Plan was updated in March 2017.

6.3 SEDIMENTATION POND

Action Item	Action Status
The Sedimentation Pond was removed from service in 2021 and is no longer a CCR unit.	(not applicable)

6.4 BOTTOM ASH MONOFILL

6.4.1 Current Bottom Ash Monofill Action Items

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

Action Item	Action Status
1) Minor erosion throughout the CCR unit.	Repair erosion if it exceeds 1 foot in depth. 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) There is an erosion gully several feet deep near the south end of the Bottom Ash Monofill.	Repair the erosion.

6.4.2 Previous Bottom Ash Monofill Action Items

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

Action Item	Action Status
1) There is a 2.5-foot deep erosion gully on the top of the CCR unit along the eastern slope. The gully extends through the cover soil and into the underlying bottom ash (2018 inspection).	The erosion gully was repaired.
2) There is significant headcutting at the inlet and northwest corner of the Stormwater Detention Basin (2018 inspection).	The headcutting was repaired.
3) Evidence of headcutting in inlet channel to run-off detention basin located in SE corner of landfill. Recommend to monitor extent during weekly, next annual inspection and repair if needed. Does not seem to compromise storage or performance of landfill itself (2015, 2016, and 2017 inspections).	The headcutting was repaired.
4) Evidence of sediment from side channel blocking run-on channel adjacent to NW corner of landfill. Recommend excavation of in-filled sediment and placement of riprap or other erosion control measures to control side channel and prevent compromise to function of run-on diversion channel (2015, 2016, and 2017 inspections).	The headcutting was repaired.

7.0 REFERENCES

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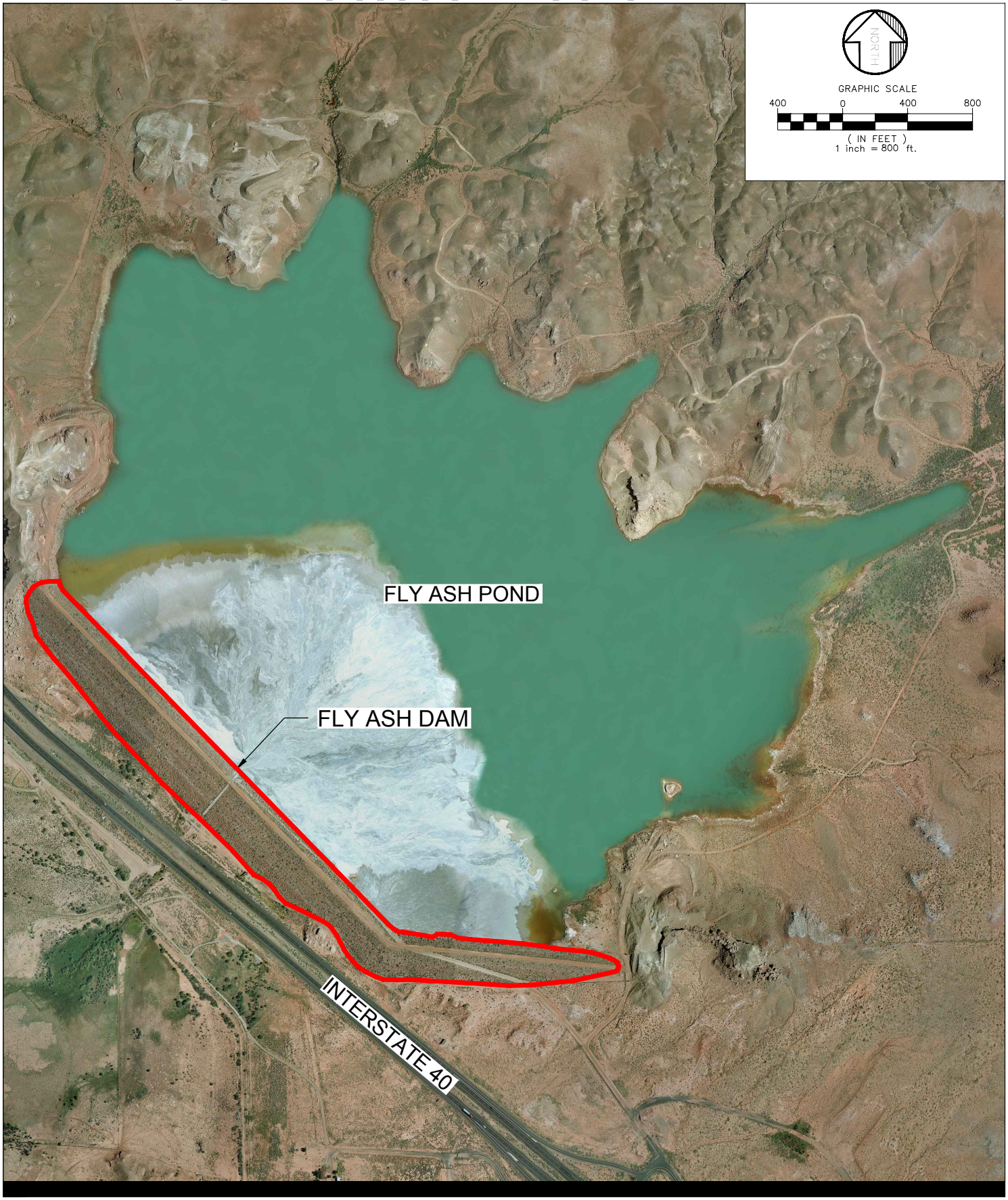
FIGURES

Last saved by: LEE.WRIGHT(2018-11-27) Last Plotted: 2018-11-27
Filename: P:\PROJECTS\ARIZONA_PUBLIC_SERVICE\60589229_2018_FC_CH_MD_CCR_INSPECTIONS\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 1 - FLY ASH POND.DWG
ANSI A 8.5" x 11"



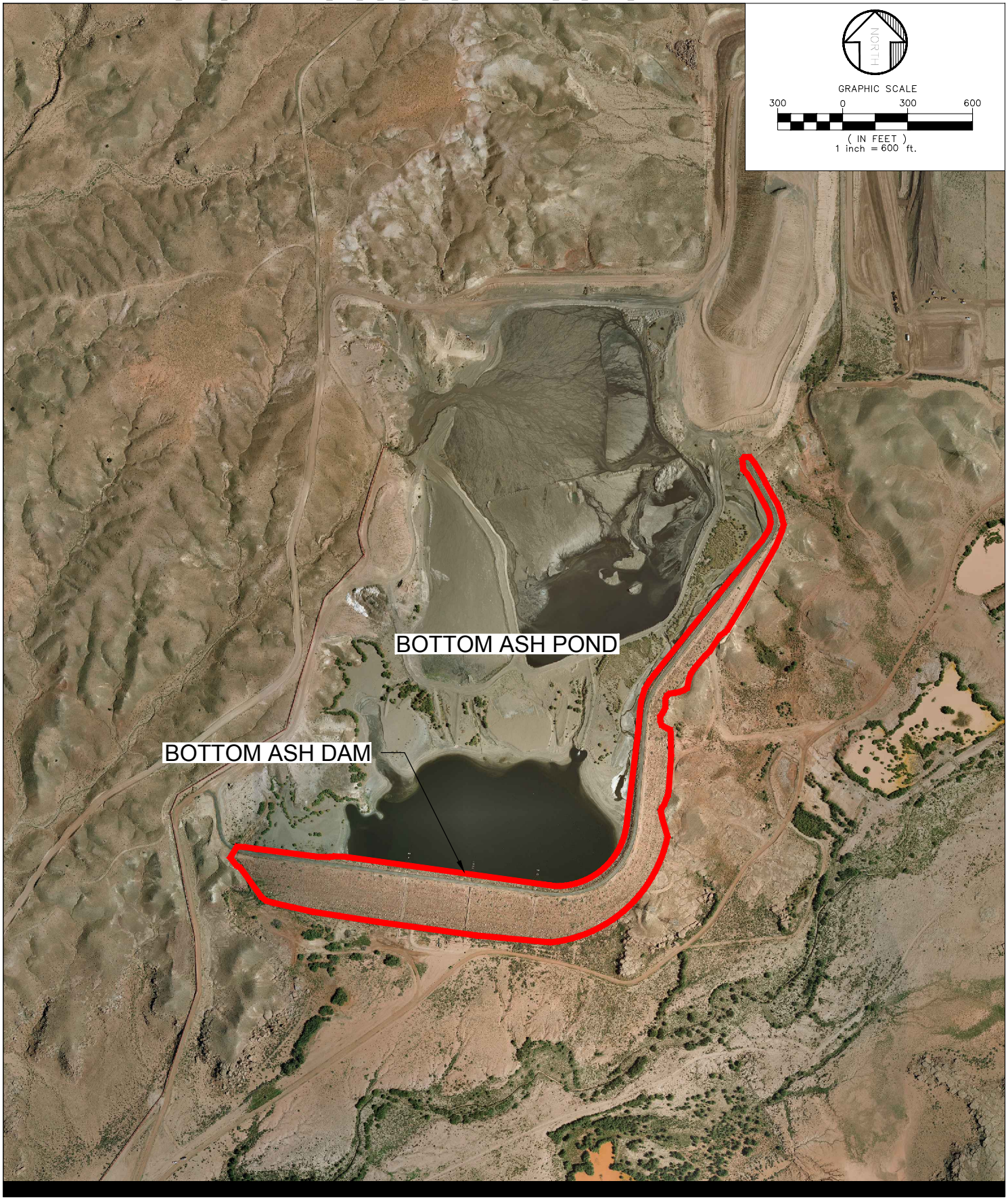
CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

FLY ASH POND
SITE MAP

AECOM

FIGURE 1

Last saved by: LEE.WRIGHT(2018-11-27) Last Plotted: 2018-11-27 ANSI A 8.5" x 11"
Filename: P:\PROJECTS\ARIZONA_PUBLIC_SERVICE\60589229_2018_FC_CH_MD_CCR_INSPECTIONS\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 2 - BOTTOM ASH POND.DWG



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(2018-11-27) Last Plotted: 2018-11-27 ANSI A 8.5" x 11"
Filename: P:\PROJECTS\ARIZONA_PUBLIC_SERVICE\60589229_2018_FC_CH_MD_CCR_INSPECTIONS\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 3 - SEDIMENTATION POND.DWG

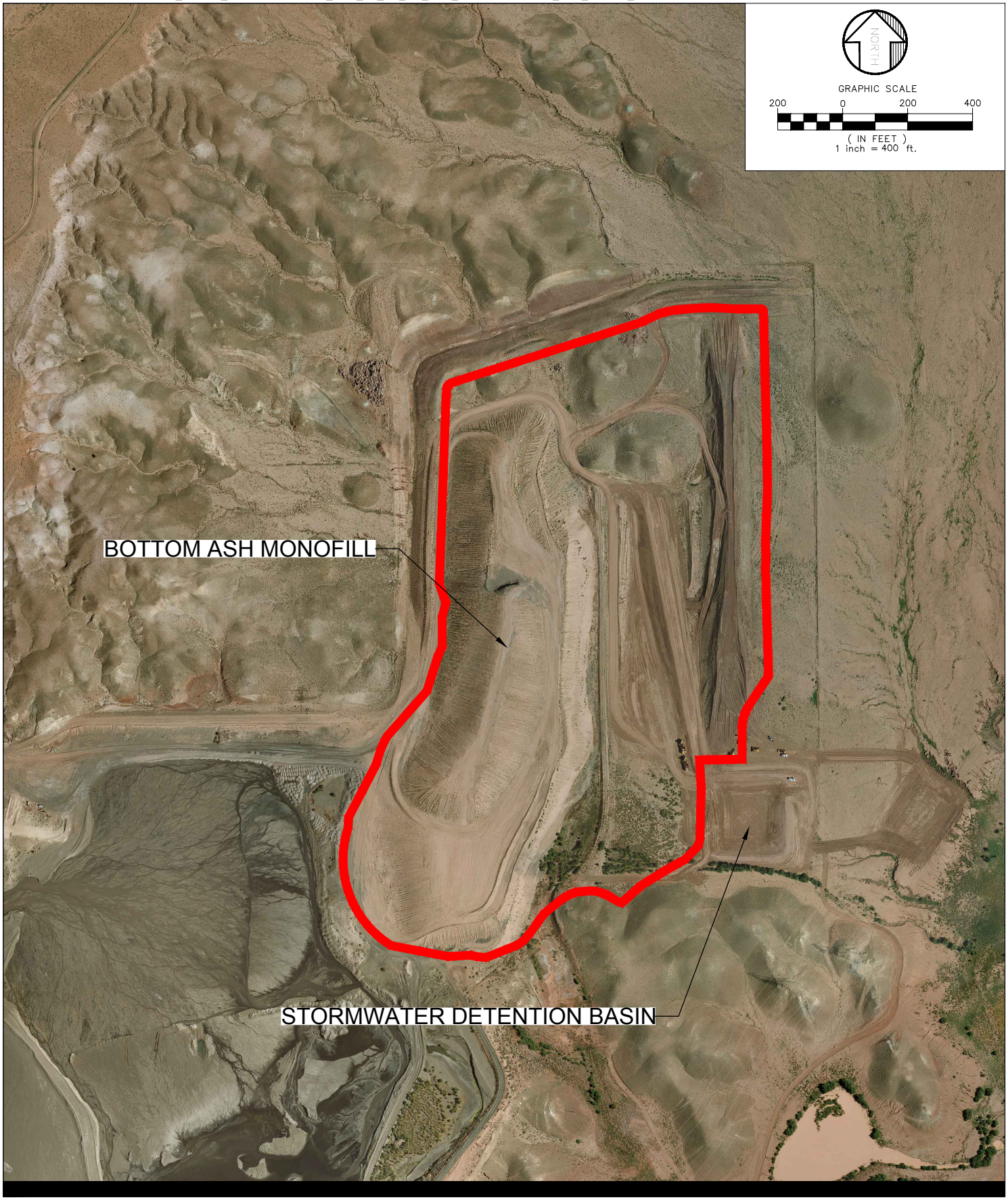
CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

SEDIMENTATION POND
SITE MAP

AECOM

FIGURE 3

Last saved by: LEE.WRIGHT(2018-11-27) Last Plotted: 2018-11-27 ANSI A 8.5" x 11"
Filename: P:\PROJECTS\ARIZONA_PUBLIC_SERVICE\60589229_2018_FC_CH_MD_CCR_INSPECTIONS\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 4 - BOTTOM ASH MONOFILL.DWG



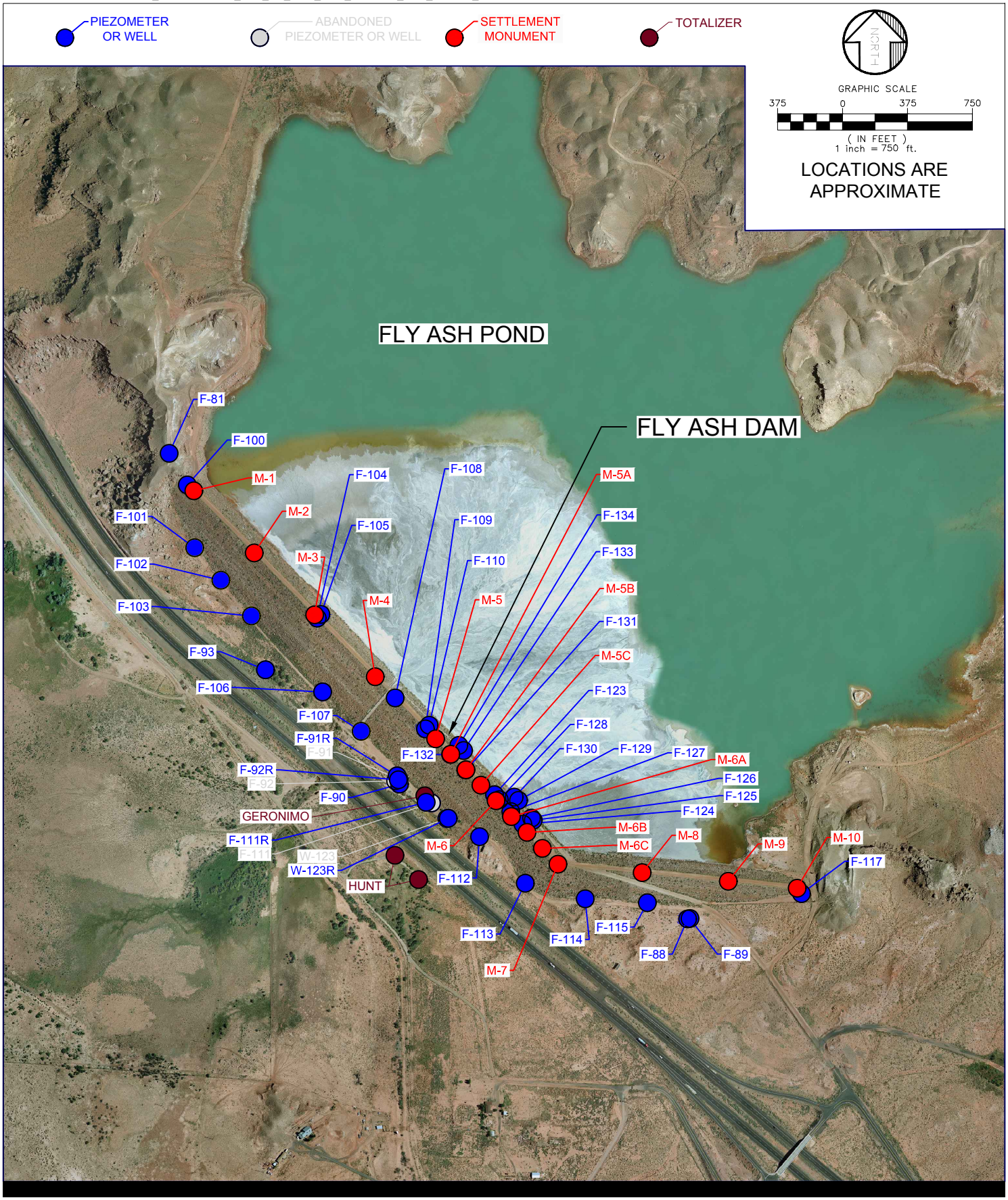
CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

BOTTOM ASH MONOFILL
SITE MAP

AECOM

FIGURE 4

Last saved by: LEE.WRIGHT(2021-12-29) Last Plotted: 2021-12-29
Filename: L:\DCS\PROJECTS_WTR\60670431_APS_CH_2021_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 5 - FLY ASH DAM INSTRUMENTS.DWG
ANSI A 8.5" x 11"



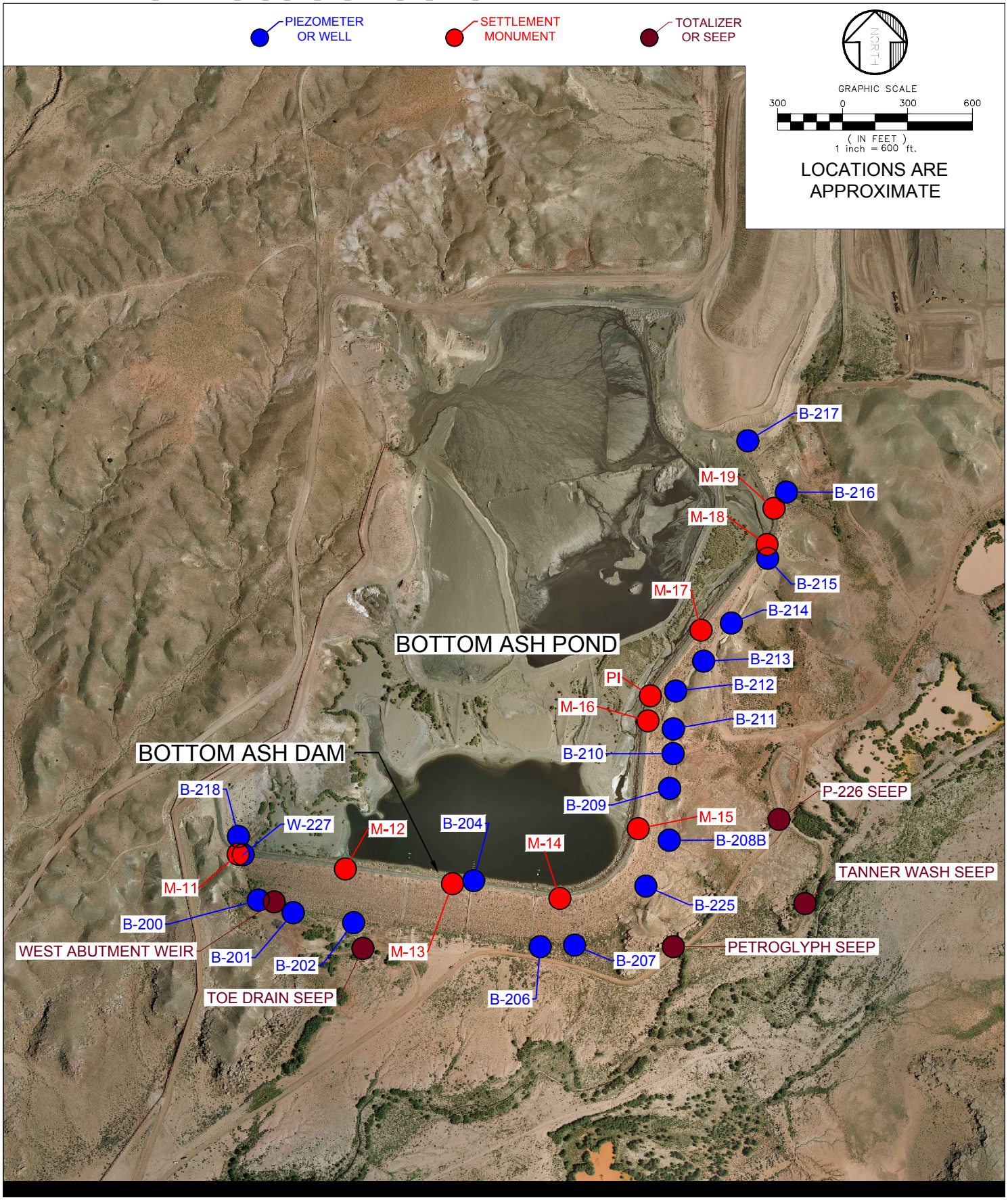
CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

FLY ASH DAM
INSTRUMENTATION MAP

AECOM

FIGURE 5

Last saved by: LEE.WRIGHT(2021-12-29) Last Plotted: 2021-12-29
Filename: L:\DCS\PROJECTS_WTR\60670431_APS_CH_2021_DAM_INSP\900_CAD_GIS\910_CAD\25-SKETCHES\FIGURE 6 - 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 6

APPENDIX A

FLY ASH DAM PHOTO LOG

20211025 – IMG_6757
Sign identifying allowed and disallowed materials in the Fly Ash Pond.

20211025 – IMG_6765
The crest of the Fly Ash Dam, facing northwest from the South Embankment.

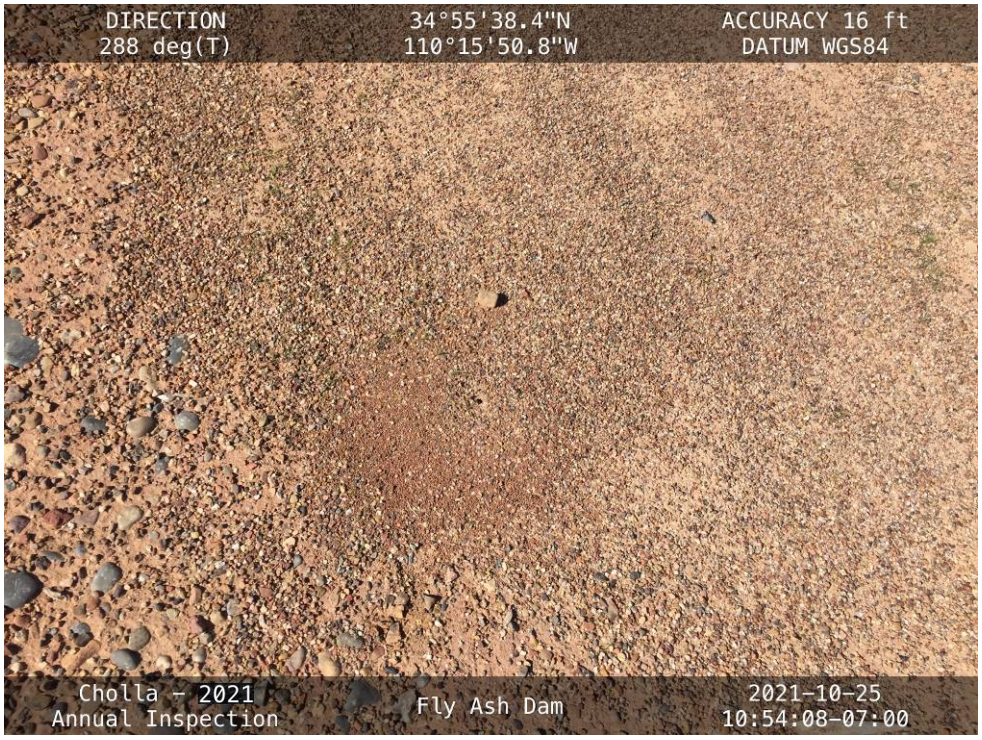
20211025 – IMG_6772
The downstream slope of the Fly Ash Dam, facing northwest from the South Embankment.

20211025 – IMG_6773
The upstream slope of the Fly Ash Dam, facing northwest from the South Embankment.

20211025 – IMG_6774
The upstream slope of the South Embankment, facing east.

20211025 – IMG_6777
The downstream slope of the South Embankment, facing west from the Left Abutment.

20211025 – IMG_6780
The upstream slope of the South Embankment, facing west from the Left Abutment.



20211025 – IMG_6783
An ant hill on the crest of the South Embankment.

20211025 – IMG_6784
The upstream slope of the West Embankment, facing northwest.

20211025 – IMG_6786
Minor erosion on the upstream side of the crest in an area where the crest is wider.

20211025 – IMG_6787

Two instances of minor erosion on the upstream side of the crest. No crack observed on the crest.

20211025 – IMG_6792

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

20211025 – IMG_6793
Minor erosion on the upstream side of the crest in an area where the crest is wider (compare to 2020 Photo IMG_2344).

20211025 – IMG_6794
Minor erosion on the upstream side of the crest in an area where the crest is wider.

20211025 – IMG_6795
The piezometers along the crest of the West Embankment, facing southeast.

20211025 – IMG_6796
Location where part of a 20-foot-long discontinuous crack was observed during the 2020 inspection. Not observed during this inspection.

20211025 – IMG_6798
The upstream slope of the West Embankment, facing northwest (south of the discharge lines).

20211025 – IMG_6799
The inlet pipe depositing CCR into the impoundment.

20211025 – IMG_6800
The inlet pipes along the upstream slope.

20211025 – IMG_6801
The upstream slope along the southern half of the West Embankment, facing southeast.

20211025 – IMG_6802
The crest along the southern half of the West Embankment, facing southeast.

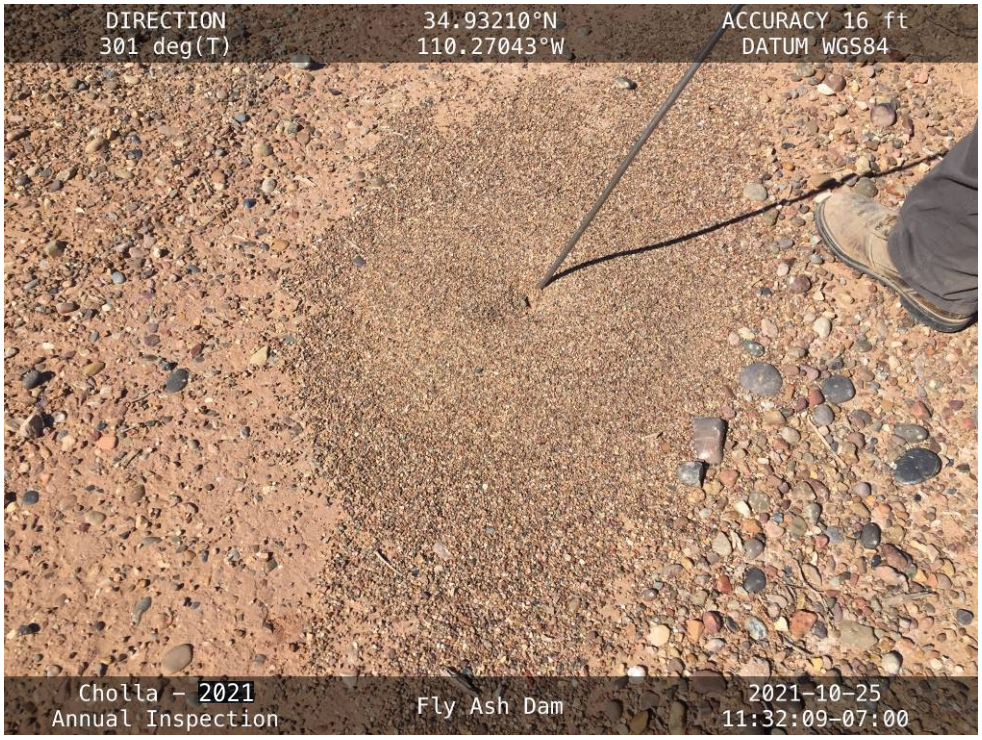
20211025 – IMG_6803
The downstream slope along the southern half of the West Embankment, facing southeast.

20211025 – IMG_6806
The inlet pipes along the downstream slope.

20211025 – IMG_6808
The upstream slope along the northern half of the West Embankment, facing northwest.

20211025 – IMG_6809
The crest along the northern half of the West Embankment, facing northwest.

20211025 – IMG_6810
The downstream slope along the northern half of the West Embankment, facing northwest.



20211025 – IMG_6815
An ant hill on the crest of the West Embankment.

20211025 – IMG_6816
Settlement monument M-2 on the crest of the West Embankment.

20211025 – IMG_6824
The downstream side of the Right Abutment contact.

20211025 – IMG_6825
The downstream slope of the Fly Ash Dam, facing southeast from the Right Abutment.

20211025 – IMG_6834
The upstream slope of the Fly Ash Dam, facing southeast from the Right Abutment.

20211025 – IMG_6853
The downstream slope of the Fly Ash Dam, facing south toward the Geronimo Seep.

20211025 – IMG_6856

The downstream slope of the South Embankment, facing east from the West Embankment.

20211025 – IMG_6869

The downstream slope and toe of the South Embankment.

20211025 – IMG_6870
Monitoring well F-113 at the toe of the West Embankment.

20211025 – IMG_6874
Area of historic erosion along the downstream toe of the West Embankment.

20211025 – IMG_6881
New piezometer F-111R installed to replace piezometer F-111 near the Geronimo Seep.

20211025 – IMG_6882
The south side of the Geronimo Seep with new wells and piezometers installed.

20211025 – IMG_6885
The well abandonment marker for piezometer F-111 set in May 2021.

20211025 – IMG_6891
The downstream toe of the West Embankment, facing northwest from the Geronimo Sump.

20211025 – IMG_6892
The downstream toe of the West Embankment and the north side of the Geronimo Seep.

20211025 – IMG_6893
The downstream toe of the West Embankment, facing northwest from the inlet pipes.

20211025 – IMG_6898
The downstream toe of the West Embankment, facing southeast from the inlet pipes.

20211025 – IMG_6900
The Geronimo totalizer.

20211025 – IMG_6901
The Hunt totalizer.

20211025 – IMG_6905
The inlet pipes along the upstream slope of the West Embankment.

20211025 – IMG_6907
The downstream slope of the West Embankment, facing north near the inlet pipes.

20211025 – IMG_6912
The lower half of the Right Abutment groin on the downstream slope, facing southeast from the abutment contact.

20211025 – IMG_6918

The upper half of the Right Abutment groin on the downstream slope, facing the abutment contact.

20211025 – IMG_6921

The lower half of the Right Abutment groin on the downstream slope, facing southeast from the abutment contact.

20211025 – IMG_6927
The I-40 seep.

20211025 – IMG_6928
The I-40 seep.

APPENDIX B

BOTTOM ASH DAM PHOTO LOG

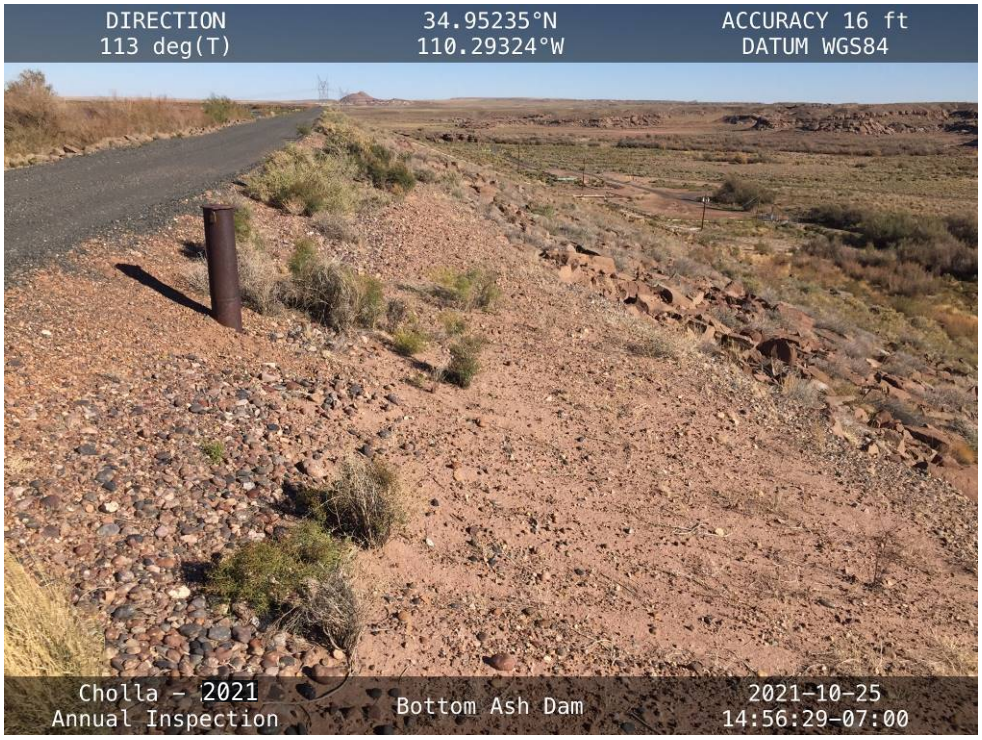
20211025 – IMG_6972

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

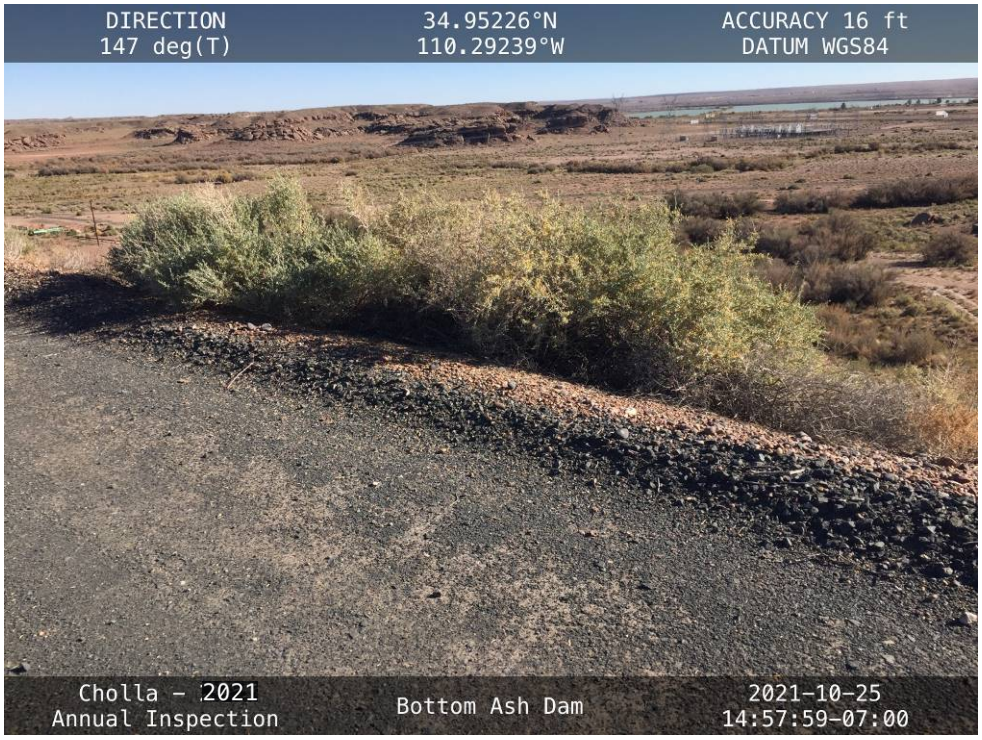
20211025 – IMG_6976

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

20211025 – IMG_6977
The South Embankment crest, facing east from the Right Abutment.



20211025 – IMG_6979
The downstream slope of the South Embankment, facing east from the Right Abutment.



20211025 – IMG_6981
Vegetation growing on the downstream slope of the South Embankment.

20211025 – IMG_6987
An ant hill on the downstream shoulder of the South Embankment crest.

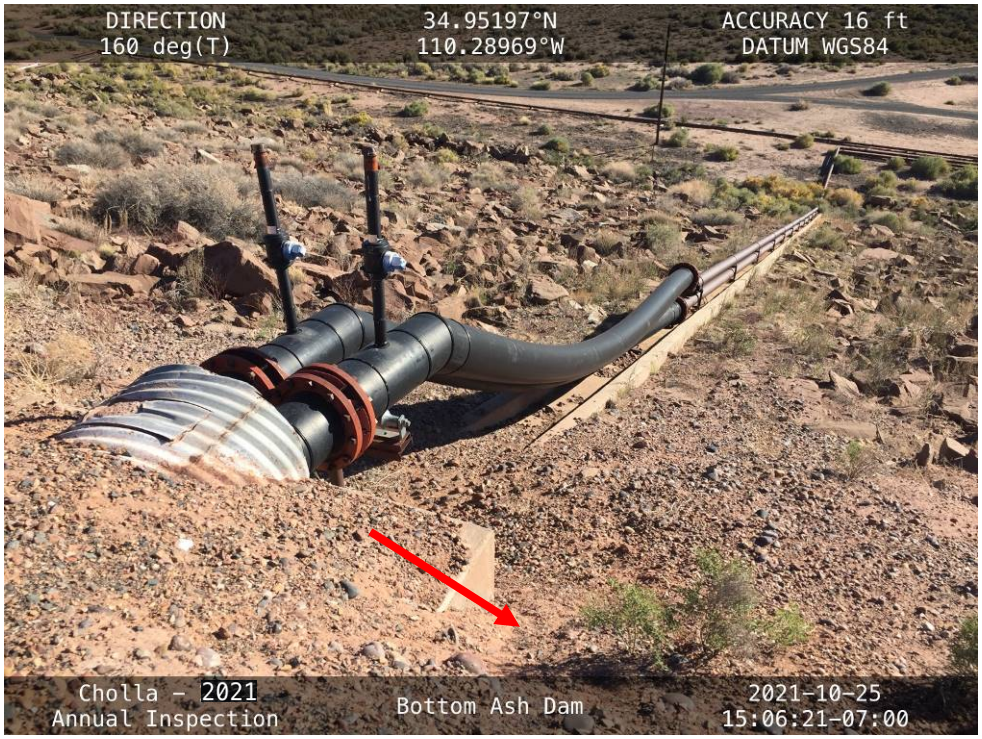
20211025 – IMG_6997
The western siphon line along the upstream slope of the South Embankment.

20211025 – IMG_6998
Minor erosion around the concrete encasement for the western siphon line, facing upstream.

20211025 – IMG_7001
The western siphon line along the downstream slope of the South Embankment.

20211025 – IMG_7006
The support material on the downstream side of M-13 starting to separate from the concrete.

20211025 – IMG_7008
The central siphon lines along the upstream slope of the South Embankment.



20211025 – IMG_7010
Minor erosion around the concrete encasement for the central siphon lines.

20211025 – IMG_7011
The central siphon lines along the downstream slope of the South Embankment.

20211025 – IMG_7014
The reservoir level staff gauge adjacent to the central siphon lines.

20211025 – IMG_7016
The upstream slope along the eastern half of the South Embankment, facing east.

20211025 – IMG_7017
The upstream slope along the western half of the South Embankment, facing west.

20211025 – IMG_7022
The eastern siphon line along the downstream slope of the South Embankment.

20211025 – IMG_7033
The eastern siphon line along the upstream slope of the South Embankment.

20211025 – IMG_7026

The downstream slope and crest of the South Embankment, facing west from the eastern siphon line.

20211025 – IMG_7029

The upstream slope at the southern end of the East Embankment, facing east.

20211025 – IMG_7036
Minor erosion rill forming on the upstream shoulder of the South Embankment (1 foot across).

20211025 – IMG_7037
The upstream slope at the eastern end of the South Embankment, facing west.

20211025 – IMG_7039
The upstream slope of the East Embankment, facing north from the southern end.

20211025 – IMG_7045
Repaired area where two shallow holes were observed during the 2020 inspection (IMG_2694).

20211025 – IMG_7052
A 2.5-inch-deep depression along the upstream shoulder of the East Embankment.

20211025 – IMG_7053
A hole on the downstream shoulder of the East Embankment crest.

20211025 – IMG_7054

Repaired area where a shallow hole was observed during the 2020 inspection (IMG_2695).

20211025 – IMG_7056

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

20211025 – IMG_7060
Minor erosion rill forming on the upstream shoulder of the East Embankment (7 inches across).

20211025 – IMG_7062
An ant hill on the upstream shoulder of the East Embankment crest.

20211025 – IMG_7064
A hole on the upstream shoulder of the East Embankment.

20211025 – IMG_7069
The upstream slope of the northern half of the East Embankment, facing northeast.

20211025 – IMG_7070
The downstream slope of the southern half of the East Embankment, facing south.

20211025 – IMG_7071
The downstream slope of the northern half of the East Embankment, facing northeast.

20211025 – IMG_7072
The crest of the East Embankment, facing south from the middle of the embankment.

20211025 – IMG_7073
A hole on the downstream shoulder of the East Embankment crest.

20211025 – IMG_7074
The crest of the East Embankment, facing northeast from the middle of the embankment.

20211025 – IMG_7075
Erosion rills forming on the upstream slope of the East Embankment. The ruler is 13 inches long.

20211025 – IMG_7082
A hole on the upstream half of the East Embankment crest.

20211025 – IMG_7083
Repaired area where a series of holes was observed during the 2020 inspection (IMG_2700).

20211025 – IMG_7093
A hole on the upstream shoulder of the East Embankment, also observed during the 2020 inspection (IMG_2704).

20211025 – IMG_7095
New holes observed on the upstream shoulder of the East Embankment, where a hole observed during the 2020 inspection had been repaired (IMG_2718).

20211025 – IMG_7097

A set of holes on the downstream shoulder in the northern portion of the East Embankment.

20211025 – IMG_7098

A set of holes on the downstream shoulder in the northern portion of the East Embankment.

20211025 – IMG_7099
A set of holes on the downstream shoulder in the northern portion of the East Embankment.

20211025 – IMG_7112
The crest of the East Embankment, facing south from the north end of the embankment.

20211025 – IMG_7117
An animal burrow near the access road along the downstream slope of the East Embankment.

20211025 – IMG_7118
The access road along the downstream slope of the East Embankment, facing south.

20211025 – IMG_7120
An erosion gully on the downstream slope along the northern half of the East Embankment.

20211025 – IMG_7127
An erosion gully on the downstream slope along the northern half of the East Embankment.

20211025 – IMG_7156
Sign identifying allowed and disallowed materials for the Bottom Ash Pond.

20211025 – IMG_7162
The North-South portion of the Divider Dike, facing south near the inlet.

20211025 – IMG_7173
Grassy vegetation growing in the area near the West Abutment Weir.

20211025 – IMG_7181
The downstream slope of the South Embankment, facing east from the West Abutment Weir.

20211025 – IMG_7182
The downstream slope of the South Embankment, facing north from the Toe Drain Seep.

20211025 – IMG_7185
The downstream slope and toe of the South Embankment, facing east from the Toe Drain Seep.

20211025 – IMG_7189
The downstream toe of the South Embankment, facing east toward the western siphon line.

20211025 – IMG_7191
Riprap deterioration along the South Embankment toe.

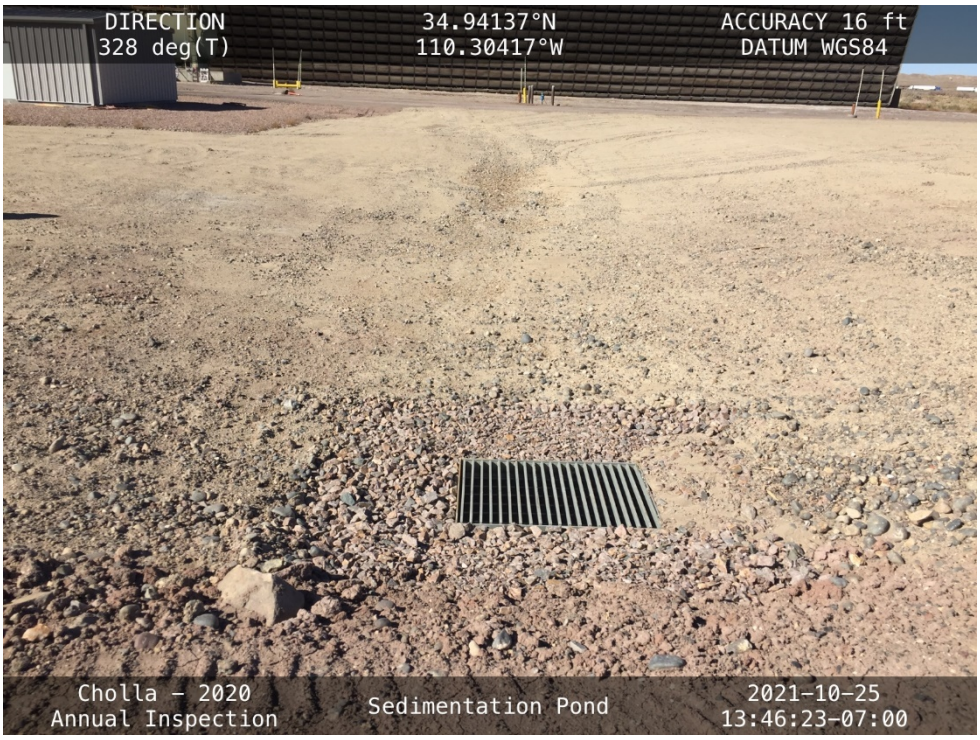
20211025 – IMG_7195
Two new monitoring wells installed near the Petroglyph Seep.

20211025 – IMG_7206
The P-232 seepage intercept area with two new wells installed (yellow monuments).

20211025 – IMG_7208
Two new monitoring wells installed near the Tanner Wash Seep.

APPENDIX C

SEDIMENTATION POND PHOTO LOG



20211025 – IMG_6933
The earthen swale and catch basin grate installed to drain surface flows, facing northwest.

20211025 – IMG_6934
The access road and crest of the former south embankment, facing west.

20211025 – IMG_6937
The downstream side of the 18-inch HDPE drain pipe installed to drain surface flows from the catch basin.

20211025 – IMG_6938
The southern end of the closed Sedimentation Pond, facing northwest toward the Sedi Tank.

20211025 – IMG_6940
The surface of the closed Sedimentation Pond, facing north from the southern end.

20211025 – IMG_6941
The surface of the closed Sedimentation Pond, facing northeast along the crest of the former south embankment.

20211025 – IMG_6942
The sign and surface of the closed Sedimentation Pond.

20211025 – IMG_6944
The surface of the closed Sedimentation Pond, facing northeast near the Sedi Tank.

20211025 – IMG_6958
The surface of the closed Sedimentation Pond, facing northeast from the northwest side.

20211025 – IMG_6960
The earthen swale installed to drain surface flows, facing southeast.

APPENDIX D

BOTTOM ASH MONOFILL PHOTO LOG

20211025 – IMG_7107
The south end of the BAM, facing north from the Bottom Ash Dam.

20211026 – IMG_7216
Shallow erosion gullies along the eastern slope of the BAM, facing west.

20211026 – IMG_7218
The western toe of the BAM, facing north from the road near the middle of the slope.

20211026 – IMG_7223
Erosion gullies along the western toe of the BAM. The ruler is 13 inches long.

20211026 – IMG_7229
An erosion gully on the southeast side of the BAM requiring repair.

20211026 – IMG_7234
Erosion rills along the slope of the stormwater diversion ditch on the north side of the BAM.

20211026 – IMG_7236
The north side of the BAM.

20211026 – IMG_7239
The stormwater diversion ditch on the east side of the BAM, facing south from the north end.

20211026 – IMG_7241

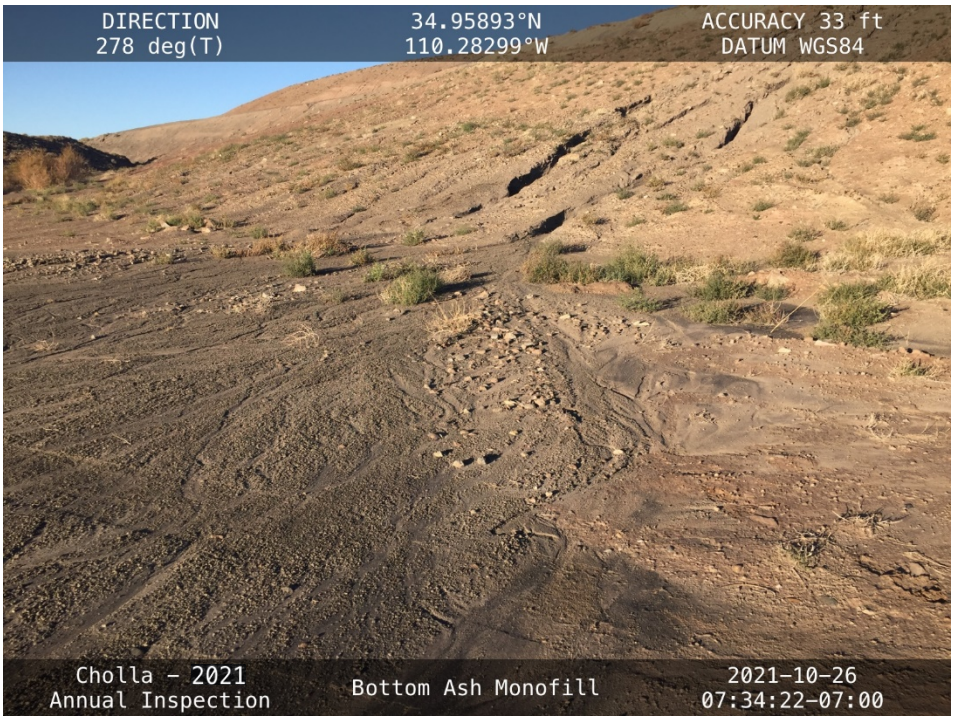
A loader placing waste coal in the BAM and generating dust. Dust generation should be minimized during material placement.

20211026 – IMG_7242

The east side of the BAM, facing west toward the northern half from the stormwater diversion ditch.

20211026 – IMG_7248
Erosion gullies forming on the north side of the Stormwater Detention Basin.

20211026 – IMG_7251
New headcutting up to 4.5 feet deep where erosion was previously repaired in the northwest corner of the Stormwater Detention Basin.



20211026 – IMG_7255
Eroded material deposited at the toe of the BAM, west of the Stormwater Detention Basin (approximately 2 feet of erosion in the slope).

20211026 – IMG_7263
Headcutting on the east side of the Stormwater Detention Basin in an area previously repaired.

20211026 – IMG_7265

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.

20211026 – IMG_7267

An erosion rill on the eastern slope near the top of the Bottom Ash Monofill, facing east from the top of the BAM toward the Stormwater Detention Pond.

20211026 – IMG_7268
The eastern portion of the Bottom Ash Monofill, facing north from the top of the Monofill.

20211026 – IMG_7272
An area of a repaired erosion gully from 2018 on the east side of the Bottom Ash Monofill.

20211026 – IMG_7275
Cover soil on the surface of the BAM, facing southwest along the top of the CCR unit.

20211026 – IMG_7275
An incipient erosion rill on the eastern slope near the top of the BAM, relatively unchanged since the 2020 inspection (IMG_2894).

20211026 – IMG_7282
An incipient erosion rill on the eastern slope near the top of the BAM.

20211026 – IMG_7283
An incipient erosion rill on the eastern slope near the top of the BAM.