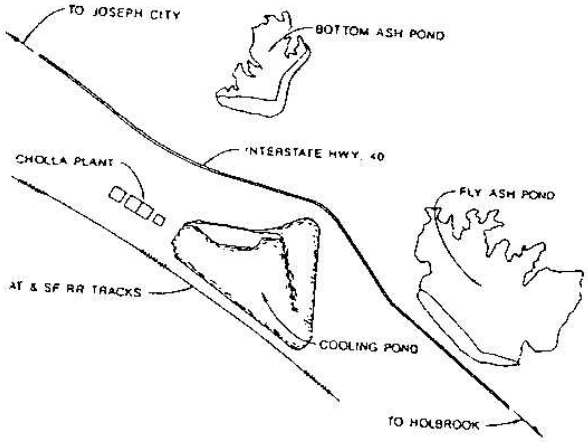
CHOLLA POWER PLANT
Fly Ash Dam, Bottom Ash Dam, Sedimentation Pond, and Bottom Ash Monofill

Annual CCR Impoundment and Landfill Inspection Report

2017



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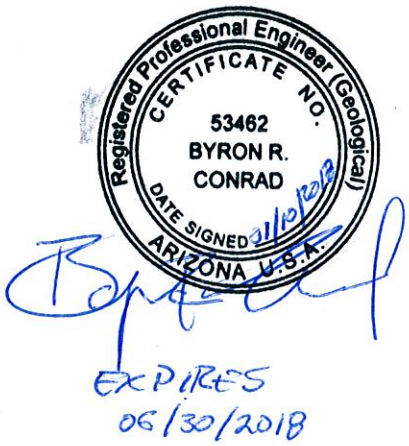
1.0 INTRODUCTION

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*" (CFR 257.83(b)(1) for CCR surface impoundments and 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

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Design Engineering
Generation Engineering
Arizona Public Service Company

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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. Three operational units (Units 1, 3, and 4) currently burn sub-bituminous coal to provide a total net generating capacity of 767 megawatts (MW). Units 1, 3, and 4 are operated based on load and economic factors.

The coal combustion process produces bottom ash (silty sand, Unified Soil Classification System SM) and fly ash (low plasticity silt, Unified Soil Classification System ML). The Plant has four CCR units: the Bottom Ash Pond, the Fly Ash Pond, the Bottom Ash Monofill, and the Sedimentation Pond. The Bottom Ash Pond and the Fly Ash Pond are used for ash 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 Sedimentation Pond collects water from drains located on the plant site and receives CCR in storm water, process water, and Plant washdown from the west side of the Plant. CCR material is also unloaded from vacuum trucks into this unit at an unloading station with a water spray system for dust suppression. These coal combustion waste facilities are the subject of this inspection report.

The field inspection was conducted on Thursday, November 16, 2017. Conditions were mild (37-75 degrees Fahrenheit) with clear skies. Winds were light. Approximately 4.27 inches of precipitation had fallen since the start of the year based on data recorded at the Winslow airport (Weather Underground 2017). Units 1, 3, and 4 were running at the time of the inspection.

Instrumentation at the dams generally 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 Survey System (GPS). Water levels in the piezometers are 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 set at the edge of the water based on NGVD29. The impounded water level in the Fly Ash Pond is measured on a monthly basis using a GPS survey.

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 NAVD88 datum. The NGS lists the elevation of the monument as 5088.09 feet (NAVD88).

3.0 IMPOUNDMENT DESCRIPTIONS

3.1 FLY ASH DAM

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

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 operating water level is elevation (EL) 5114 feet and the water level was measured most recently by survey to be at EL 5090.807 feet on November 20, 2017. 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 taken 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.

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 and the water level was observed to be at EL 5110.33 feet on November 17, 2017.

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 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.

The Sedimentation Pond is a holding pond that was placed into service in 1976 by constructing an embankment along the southeast and northwest sides. The area surrounding the Sedimentation Pond was subsequently mass-filled such that the crest appears to be at ground level. It has two cells with a maximum depth of 10 feet, a surface area of approximately 1.6 acres, and a total capacity of approximately 10.7 acre-feet. The crest is at EL 5019 feet and the water level was observed to be at approximate EL 5010.5 feet in the south cell and approximate EL 5012.5 feet in the north cell during the inspection.

3.4 BOTTOM ASH MONOFILL

The Bottom Ash Monofill is represented on Figure 4 – Bottom Ash Monofill Site Map.

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 feet above mean sea level, 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 2017 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), the Sedimentation Pond (Section 4.3), and the Bottom Ash Monofill (Section 4.4). The results are reprinted and formatted to fit this report.

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 12, 2018</td></tr>
<tr><td colspan="2">Inspected by: Byron Conrad, P.E. (APS), Lee Wright, P.E. (AECOM)</td><td colspan="2">Inspection Date: November 17, 2017</td></tr>
<tr><td colspan="2">Reviewed by: Byron Conrad, P.E. (APS)</td><td colspan="2">Review Date: December 29, 2017</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): N/A</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): 5090.807 feet (Nov. 20)</td><td rowspan="2">Photos: Yes</td><td rowspan="2">Page: 1 of 4</td></tr>
<tr><td colspan="2">Estimated Solids Level (ft): 5095 feet (based on visual observation at the staff gage and inlet 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? **See comment vi.**		**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:	**November 2017**							

			MONITORING CHECKLIST						
2	***INSTRUMENTATION AND MONITORING***								
a	Describe:	**1) A review of the file indicates 37 piezometers and wells in and around the embankment. 2) Sixteen 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 monitoring report:	**January 2017**	Should new readings be taken and new report provided? **Annual reporting is required.**			**X**			

			DAM EMBANKMENT CHECKLIST						
3	***DAM CREST***								
a	Settlements, slides, depressions?	**Elevation differences between the monitoring well collars and the crest surface. See also item 3f.**			**X**		**X**		
b	Misalignment?				**X**				
c	Longitudinal/Transverse cracking?				**X**				
d	Animal burrows?	**Ant hills were observed (photo IMG_5955). Continue to monitor.**				**X**	**X**		
e	Adverse vegetation?				**X**				
f	Erosion?	**Minor erosion observed around monitoring well collars. Continue to monitor and repair the areas if erosion worsens.**				**X**	**X**		
4	***UPSTREAM SLOPE***								
a	Erosion?	**Minor erosion observed. See photo IMG_5954.**				**X**	**X**		
b	Inadequate ground cover?				**X**				
c	Adverse vegetation?	**Shrubs and other vegetation observed.**				**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**		

Fly Ash Dam		SID: **09.28**	N/A	No	Yes	Mon	Rep	Inv
5	***DOWNSTREAM SLOPE***							
a	Erosion?	**None observed. The area along the access road near the Geronimo sump is repaired periodically.**		**X**		**X**		
b	Inadequate ground cover?			**X**				
c	Adverse vegetation?	**See comment ii.**		**X**		**X**		
d	Longitudinal/Transverse cracking?			**X**				
e	Inadequate riprap?			**X**				
f	Stone deterioration?	**The 2016 inspection noted that some of the riprap along the toe is beginning to deteriorate. See comment iii.**			**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?	**See comment iv.**		**X**		**X**		
b	Differential movement?			**X**				
c	Cracks?			**X**				
d	Settlements, slides, depressions, bulges?			**X**				
e	Seepage?	**Historic seepage near the downstream East Abutment area (I-40 seep) indicated by evaporates and soft ground. Continue to monitor.**			**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.** **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?	**Yes.**			**X**	**X**		
d	If so, does seepage contain fines?	**APS measures turbidity of seep water.**		**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?	**Suspended FGD solids and fly ash are designed to settle in the reservoir.**			**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 covered with sediment in 2015. The water level in the pond is currently measured by GPS survey along with the monthly monument readings (photo IMG_6017). This method is sufficient so long as the water level continues to remain low.

ii. Excessive natural vegetation has been removed from the toe of the dam (see photos IMG_6025, IMG_6039, and IMG_6041). Continue clearing along the toe of the dam in accordance with the NMOSE "*Vegetation Management on Dams*" (2011) document.

iii. Minor stone deterioration was observed during the 2016 inspection. The stone along the downstream slope was not significantly worse during this inspection, but should be monitored as the dam ages.

iv. Erosion has historically been observed in the downstream groin of the North Abutment. This area has been repaired. Continue to monitor and repair as needed.

v. The weekly inspection reports for the period between October 1, 2016 and September 30, 2017 indicate the following:

   a. There was vegetation on both the upstream and downstream slopes impeding the visual inspection of the CCR unit in late 2016. Corrective Action Requests were in place for vegetation removal and the vegetation was removed prior to the January 5, 2017 inspection. APS currently has a vegetation removal program in place to prevent the growth of adverse vegetation in the future.

   b. Signs of seepage around the dam were 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.

   c. 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.

vi. APS updated the Emergency Action Plan in March 2017. The plan has been posted to the publicly accessible website to comply with the requirement in CFR 257.73.

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="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: 09.27</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): Byron Conrad, P.E. (APS)</td><td colspan="2">Report Date: January 12, 2018</td></tr>
<tr><td colspan="2">Inspected by: Byron Conrad, P.E. (APS), Lee Wright, P.E. (AECOM)</td><td colspan="2">Inspection Date: November 17, 2017</td></tr>
<tr><td colspan="2">Reviewed by: Byron Conrad, P.E. (APS)</td><td colspan="2">Review Date: December 29, 2017</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): N/A</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): 5110.33</td><td rowspan="2">Photos: Yes</td><td rowspan="2">Page: 1 of 4</td></tr>
<tr><td colspan="2">Estimated Solids Level (ft): 5118 feet (based on visual observation at the divider dike)</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: **03/2017**		Should EAP be revised? **See comment vii.**		**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: **November 2017**								

MONITORING CHECKLIST									
2	***INSTRUMENTATION AND MONITORING***								
a	Describe:	**1) 19 piezometers and wells in and around the embankment.** **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:		**X**				
c	Date of last monitoring report:	**January 2017**	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?			**X**				
d	Animal burrows?	**Animal burrows were primarily in the windrow along the downstream side.**			**X**	**X**		
e	Adverse vegetation?			**X**		**X**		
f	Erosion?	**See comment i.**			**X**	**X**		
4	***UPSTREAM SLOPE***							
a	Erosion?	**There is vegetation along the upstream slope.**		**X**				
b	Inadequate ground cover?			**X**				
c	Adverse vegetation?	**There is vegetation on and near the abutments.**			**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?			**X**		**X**		
b	Inadequate ground cover?			**X**				
c	Adverse vegetation?	**See comments ii and iii.**		**X**		**X**		
d	Longitudinal/Transverse cracking?			**X**				
e	Inadequate riprap?			**X**				
f	Stone deterioration?	**Some of the riprap along the toe is beginning to deteriorate. See comment iv.**			**X**	**X**		
g	Settlements, slides, depressions, bulges?			**X**				
h	Soft spots or boggy areas?	**Historic seepage at the toe and active seepage (measured 1.5 gpm during the inspection) at the right groin area. Continue to monitor.**			**X**	**X**		
i	Movement at or beyond toe?	**Minor evidence of soil wasting from areas below the riprap adjacent to the downstream toe.**			**X**	**X**		
j	Animal burrows?	**Yes. Continue to monitor.**			**X**	**X**		
6	***ABUTMENT CONTACTS***							
a	Erosion?	**Shallow erosion rills were observed near the top of the West Abutment.**		**X**		**X**		
b	Differential movement?			**X**				
c	Cracks?			**X**				
d	Settlements, slides, depressions, bulges?			**X**				
e	Seepage?	**Yes.**			**X**	**X**		
f	Animal burrows?	**None observed. Continue to monitor.**		**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**	**X**		
c	Seepage at or beyond toe?				**X**	**X**		
d	If so, does seepage contain fines?			**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 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. Several erosion holes were observed in the crest and near the edge of the crest (example photos IMG_5841 and IMG_5859). The erosion holes in the crest were generally clustered and were only observed within a few feet of the edge.

ii. The adverse vegetation along the toe of the embankment has been cleared, but the stumps of several trees and large bushes remain (photo IMG_5922). These should also be removed with the rest of the plant and the void should be filled with compacted soil in accordance with the NMOSE "*Vegetation Management on Dams*" (2011) document.

iii. Excessive natural vegetation has recently been removed from the crest and toe of the dam (see photos IMG_5916, IMG_5923, and IMG_5927). Continue clearing along the toe of the dam in accordance with the NMOSE "*Vegetation Management on Dams*" (2011) document.

iv. The riprap in several areas of the downstream slope shows potential deterioration. The deterioration does not appear to affect the safety of the dam, nor does it appear to have become significantly worse since the 2016 inspection. Continue to monitor the condition of the riprap and replace as necessary.

v. Animal burrows appeared to be infrequent and were primarily encountered in the upper portion of the downstream slope near the crest (photos IMG_5793, IMG_5794, and IMG_5825).

vi. The weekly inspection reports for the period between January 3, 2017 and September 30, 2017 indicate the following:

    a. There was vegetation on both the upstream and downstream slopes impeding the visual inspection of the CCR unit on January 3, 2017. Corrective Action Requests were in place for vegetation removal and the vegetation was removed prior to the January 5, 2017 inspection. APS currently has a vegetation removal program in place to prevent the growth of adverse vegetation in the future.

    b. Erosion at the abutment contacts was noted as requiring monitoring throughout 2017. Shallow erosion rills were observed near the top of the West Abutment during the inspection. Previous annual inspections did not indicate erosion rills in this area. Continue to monitor.

    c. Signs of seepage around the dam were noted as requiring monitoring throughout 2017. APS monitors seepage on a regular basis and did not record adverse seepage conditions during the period between October 1, 2016 and September 30, 2017.

    d. 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.

vii. APS updated the Emergency Action Plan in March 2017. The plan has been posted to the publicly accessible website to comply with the requirement in CFR 257.73.

4.3 APS FIELD INSPECTION – SEDIMENTATION POND

<table>
<tr><td colspan="2">Sedimentation Pond</td><td colspan="2">State Identification Number (SID): N/A</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: N/A</td><td>Dam Name: Sedimentation Pond</td><td>Type: Earth</td><td>Purpose: CCR-Impacted Surface Water Collection</td></tr>
<tr><td colspan="2">Contact(s): Byron Conrad, P.E. (APS)</td><td colspan="2">Report Date: January 12, 2018</td></tr>
<tr><td colspan="2">Inspected by: Byron Conrad, P.E. (APS), Lee Wright, P.E. (AECOM)</td><td colspan="2">Inspection Date: November 17, 2017</td></tr>
<tr><td colspan="2">Reviewed by: Byron Conrad, P.E. (APS)</td><td colspan="2">Review Date: December 29, 2017</td></tr>
<tr><td colspan="2">Design Dam Crest Elevation (ft): 5019</td><td colspan="2">Design Spillway Crest Elevation: Twin 16-inch corrugated polyethylene pipes, ungated, with trash rack</td></tr>
<tr><td colspan="2">Design Total Freeboard (ft): 2</td><td colspan="2">Measured Total Freeboard (ft): Not measured</td></tr>
<tr><td colspan="2">Statutory Dam Height (ft): 11</td><td colspan="2">Structural Height (ft): East embankment: 11 ft
West embankment: 0 ft (areal fill around the Pond raised the surrounding ground surface to the elevation of the dam crest)</td></tr>
<tr><td colspan="2">Dam Crest Length (ft): 1,100</td><td>Upstream Slope: 1.5:1 (by inspection)</td><td>Downstream Slope: 1.5:1 (by inspection)</td></tr>
<tr><td colspan="2" rowspan="2">Dam Crest Width (ft): 24</td><td>Lat: 34° 56′ 29.9″N</td><td rowspan="2">Water Rights: N/A</td></tr>
<tr><td>Long: 110° 18′ 14.9″W</td></tr>
<tr><td colspan="2">Reservoir Area (acres): 1.6</td><td colspan="2">Reservoir Storage (ac-ft): 10.7</td></tr>
<tr><td colspan="4">Inflow Design Flood/Safe Flood-Passing Capacity: Not Calculated</td></tr>
<tr><td colspan="2">Reservoir Level During Inspection (ft): 5010.5 (south cell), 5012.5 (north cell)</td><td rowspan="2">Photos: Yes</td><td rowspan="2">Page: 1 of 3</td></tr>
<tr><td colspan="2">Estimated Solids Level (ft): Below EL 5010.5 (south cell), Below EL 5012.5 (north cell)</td></tr>
</table>

Sedimentation Pond			SID: **N/A**	N/A	No	Yes	Mon	Rep	Inv
COMPLIANCE CHECKLIST									
1	***CONDITION SUMMARY/LICENSE/EAP/NEXT INSPECTION***								
a	Recorded downstream hazard:	**Very Low**	Should hazard be revised?		**X**				
b	If high hazard, estimate downstream persons-at-risk (PAR): **N/A**		Is there a significant increase since the last inspection?		**X**				
c	Recorded size:	**Small**	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:	**N/A**	Should level be revised:		**X**				
g	Any License violations?	**No**	Describe and list required action:		**X**				
h	Date of current License:	**N/A**	Should new License be issued?		**X**				
i	Date of last Emergency Action Plan revision: **N/A**		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: **November 2018**								

MONITORING CHECKLIST									
2	***INSTRUMENTATION AND MONITORING***								
a	Describe:	**There are no instruments or other monitoring devices for this structure due to its small size.**							
b	Any repair or replacement required? **No.**		Describe: **N/A**	**X**					
c	Date of last monitoring report:	**January 2017**	Should new readings be taken and new report provided? **N/A**		**X**				

DAM EMBANKMENT CHECKLIST								
3	***DAM CREST***							
a	Settlements, slides, depressions?			**X**				
b	Misalignment?			**X**				
c	Longitudinal/Transverse cracking?			**X**				
d	Animal burrows?	**None observed. Continue to monitor.**		**X**		**X**		
e	Adverse vegetation?			**X**				
f	Erosion?			**X**				
4	***UPSTREAM SLOPE***							
a	Erosion?				**X**			
b	Inadequate ground cover?			**X**				
c	Adverse vegetation?			**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**		

Sedimentation Pond		SID: **N/A**	N/A	No	Yes	Mon	Rep	Inv
5	***DOWNSTREAM SLOPE***							
a	Erosion?	**See comment i.**			**X**	**X**		
b	Inadequate ground cover?	**Mostly gravel-faced.**		**X**				
c	Adverse vegetation?			**X**				
d	Longitudinal/Transverse cracking?			**X**				
e	Inadequate riprap?			**X**				
f	Stone deterioration?			**X**				
g	Settlements, slides, depressions, bulges?			**X**				
h	Soft spots or boggy areas?			**X**				
i	Movement at or beyond toe?			**X**				
j	Animal burrows?	**None observed. Continue to monitor.**		**X**		**X**		
6	***ABUTMENT CONTACTS***							
a	Erosion?	**Abutments not defined due to general plant grading.**	**X**					
b	Differential movement?		**X**					
c	Cracks?		**X**					
d	Settlements, slides, depressions, bulges?		**X**					
e	Seepage?		**X**					
f	Animal burrows?		**X**					
7	***SEEPAGE/PIPING CONTROL DESIGN FEATURE(S)***							
a	Describe:	**None.**						
b	Internal drains flowing?		**X**					
c	Seepage at or beyond toe?		**X**					
d	If so, does seepage contain fines?		**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?	**Suspended sediment and CCR are designed to settle in the two chambers of the impoundment.**			**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?	**Yes, two 16-inch corrugated polyethylene pipe outlets in the south chamber (see photo IMG_6060).**			**X**			

Additional comments and recommendations for the Sedimentation Pond:

i. Minor erosion was observed along the edges of the concrete outfall structure (photos IMG_6068, IMG_6070, and IMG_6071).

ii. The weekly inspection reports for the period between November 8, 2016 and September 30, 2017 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.

4.4 APS FIELD INSPECTION – BOTTOM ASH MONOFILL

<table>
<tr><td colspan="2">Bottom Ash Monofill</td><td colspan="3">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): Byron Conrad, P.E. (APS)</td><td colspan="2">Report Date: January 12, 2018</td></tr>
<tr><td colspan="2">Inspected by: Byron Conrad, P.E. (APS), Lee Wright, P.E. (AECOM)</td><td colspan="2">Inspection Date: November 17, 2017</td></tr>
<tr><td colspan="2">Reviewed by: Byron Conrad, P.E. (APS)</td><td colspan="2">Review Date: December 29, 2017</td></tr>
<tr><td colspan="2">Design Maximum Ash Elevation (ft): 5261</td><td colspan="2">Current Ash Elevation: 5204 feet for capped west portion, 5124 feet for newly-prepared 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</td><td colspan="2">Page: 1 of 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 monitoring report: **January 2017**	Should new readings be taken and new report provided? **N/A**		**X**				
2	***CONDITION SUMMARY***							
a	Waste placed in good practices? **Yes. See comment i.**				**X**			
3	***LANDFILL CONFIGURATION***							
a	Settlements, slides, slope stability? **No, none apparent.**			**X**				
b	Cracking? **No, none apparent.**			**X**				
c	Run on control?				**X**	**X**		
d	Run off control?				**X**			
e	Erosion? **Minor erosion rills and an erosion channel along the western side. See comment ii.**				**X**		**X**	
f	Dust control issues? **No dust control issues evident during inspection.**			**X**				

Additional comments and recommendations for the Bottom Ash Monofill:

i. Waste is placed in the Bottom Ash Monofill on an annual basis after being dredged from the Bottom Ash Pond. The waste appeared to have been placed in accordance with good practice.

ii. Erosion rills were observed along the western slope of the CCR unit and a shallow erosion channel was observed in the northwest corner of the CCR unit (photos IMG_5722 and IMG_5725). Monitor these areas and repair them if the erosion depth exceeds 1 foot.

iii. There is evidence of headcutting in the inlet to the Stormwater Detention Basin (photos IMG_5738 and IMG_5741). The headcutting appears to be slightly deeper compared to a similar observation in the 2016 Annual Inspection. Based on the state and location of the erosion during the inspection, the degree of the erosion does not seem to compromise storage or performance of the landfill.

iv. The weekly inspection reports for the period between October 1, 2016 and September 30, 2017 indicate the following:

   a. Signs of erosion on the landfill were observed through July 11, 2017. The erosion was repaired prior to the July 13, 2017 inspection.

   b. 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 BASIC DATA REPORT 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 2016.

5.1.2 Instrumentation

The location of geotechnical and other related instrumentation in the vicinity of the Fly Ash Pond are shown on Figure 5 - Fly Ash Pond Instrumentation Map.

The minimum and maximum recorded readings for each instrument over the October 1, 2016 – September 30, 2017 (current) review period are reported in the following table:

Instrument Name	Minimum	Maximum	Unit
Open Standpipe Piezometers (10/1/16 to 9/30/17)			
F-81	5058.93	5059.61	EL (ft)
F-88	4999.96	5002.97	EL (ft)
F-89	5057.31	5059.32	EL (ft)
F-90	4992.33	4995.08	EL (ft)
F-91	5003.98	5006.75	EL (ft)
F-92	5010.95	5012.90	EL (ft)
F-93	5017.42	5018.00	EL (ft)
F-100	5079.96	5081.82	EL (ft)
F-101	5049.84	5051.12	EL (ft)
F-102	5025.62	5026.59	EL (ft)
F-103	5017.37	5017.95	EL (ft)
F-104	5065.01	5067.19	EL (ft)
F-105	5086.10	5089.19	EL (ft)
F-106	5015.27	5016.24	EL (ft)
F-107	5025.23	5026.40	EL (ft)
F-108	5058.24	5060.08	EL (ft)
F-109	5035.30	5036.23	EL (ft)
F-110	5090.68	5093.00	EL (ft)
F-111	5030.44	5031.30	EL (ft)
F-112	5026.85	5027.35	EL (ft)
F-113	5039.59	5040.34	EL (ft)
F-114	Dry	Dry	EL (ft)
F-115	5030.75	5031.25	EL (ft)

Instrument Name	Minimum	Maximum	Unit
F-117	5086.59	5087.78	EL (ft)
F-123	5087.49	5088.79	EL (ft)
F-124	5087.53	5087.85	EL (ft)
F-125	Dry	Dry	EL (ft)
F-126	5081.86	5083.81	EL (ft)
F-127	5074.84	5076.58	EL (ft)
F-128	5091.75	5092.19	EL (ft)
F-129	5086.54	5095.74	EL (ft)
F-130	5079.90	5081.52	EL (ft)
F-131	5059.90	5061.18	EL (ft)
F-132	5088.58	5089.28	EL (ft)
F-133	5083.34	5087.08	EL (ft)
F-134	5065.66	5067.10	EL (ft)
W-123	5036.57	5038.18	EL (ft)
Settlement Monuments (10/1/16 to 9/30/17)			
M-1	5120.920	5120.971	EL (ft)
M-2	5120.438	5120.497	EL (ft)
M-3	5119.794	5119.872	EL (ft)
M-4	5118.991	5119.065	EL (ft)
M-5	5117.981	5118.039	EL (ft)
M-5A	5117.752	5117.811	EL (ft)
M-5B	5117.600	5117.647	EL (ft)
M-5C	5117.917	5117.981	EL (ft)
M-6	5119.040	5119.112	EL (ft)
M-6A	5118.688	5118.738	EL (ft)
M-6B	5119.088	5119.741	EL (ft)
M-6C	5120.037	5120.075	EL (ft)
M-7	5119.482	5119.556	EL (ft)
M-8	5119.585	5119.667	EL (ft)
M-9	5120.011	5120.073	EL (ft)
M-10	5119.929	5119.988	EL (ft)
Totalizers (10/1/16 to 9/30/17)			
Geronimo	17.35	39.77	gpm
Hunt	1.14	12.11	gpm

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

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 settlement surveys use a base point near the dam (fly ash base point 2000) that had originally been calibrated to the NGS Randell 2 monument in Joseph City, Arizona prior to 1990. In June 2010, fly ash base point 2000 was recalibrated to the Randell 2 monument and the resulting raw data from the 2010 survey include all differential movement between these two survey points over a time frame of more than 20 years. Settlement surveys conducted since 2010 indicate little to no movement at the survey monuments.

The data for the totalizers during the current review period indicates that the seepage flow rates have decreased slightly when compared to the October 1, 2016 – September 30, 2017 review period. This is likely due to the reduced ponded water level in the impoundment.

5.1.3 CCR and Water Elevations

The CCR and water elevations in the CCR unit at the time of the inspection are recorded on the Field Inspection form presented in Section 4.1.

The approximate minimum water level in the Fly Ash Pond during the October 1, 2016 – September 30, 2017 review period is EL 5091.116 feet. The approximate maximum water level in the Fly Ash Pond during the October 1, 2016 – September 30, 2017 review period is EL 5093.959 feet.

The minimum CCR level in the Fly Ash Pond during the October 1, 2016 – September 30, 2017 review period is below EL 5091.116 feet. CCR is deposited to form a beach against the dam and flow away from the impoundment. As a result, the lowest CCR elevation is below the water surface. The approximate maximum CCR level in the Fly Ash Pond during the October 1, 2016 – September 30, 2017 review period is EL 5095 feet.

5.1.4 Storage Capacity

The estimated remaining storage capacity of the CCR unit at the time of the inspection was 11,000 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 7,000 ac-ft.

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 impoundment since the 2016 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 2016.

5.2.2 Instrumentation

The location of geotechnical and other related instrumentation in the vicinity of the Bottom Ash Pond are shown on Figure 6 - Bottom Ash Pond Instrumentation Map.

The minimum and maximum recorded readings for each instrument over the October 1, 2016 – September 30, 2017 (current) review period are reported in the following table:

Instrument Name	Minimum	Maximum	Unit
Open Standpipe Piezometers (10/1/16 to 9/30/17)			
B-200	5045.98	5048.39	EL (ft)
B-201	5043.68	5045.43	EL (ft)
B-202	5040.25	5041.92	EL (ft)
B-204	5097.77	5099.32	EL (ft)
B-206	5028.13	5029.81	EL (ft)
B-207	5030.76	5032.54	EL (ft)
B-208B	Dry	Dry	EL (ft)
B-209	5072.27	5072.75	EL (ft)
B-210	5066.24	5066.87	EL (ft)
B-211	Dry	Dry	EL (ft)
B-212	5090.68	5091.76	EL (ft)
B-213	5079.68	5080.28	EL (ft)
B-214	5078.74	5079.65	EL (ft)
B-215	5078.86	5079.41	EL (ft)
B-216	5072.43	5073.13	EL (ft)
B-217	5100.75	5102.48	EL (ft)
B-218	5092.97	5094.90	EL (ft)
B-225	5058.79	5059.57	EL (ft)
W-227	5090.49	5091.75	EL (ft)
Settlement Monuments (10/1/16 to 9/30/17)			
M-11	5123.270	5123.355	EL (ft)
M-12	5122.861	5122.906	EL (ft)
M-13	5122.774	5122.831	EL (ft)
M-14	5119.389	5119.452	EL (ft)
M-15	5123.008	5123.077	EL (ft)

Instrument Name	Minimum	Maximum	Unit
M-16	5123.543	5123.609	EL (ft)
M-17	5122.960	5123.022	EL (ft)
M-18	5123.223	5123.285	EL (ft)
M-19	5123.354	5123.429	EL (ft)
PI	5123.408	5123.475	EL (ft)
Totalizers (10/1/16 to 9/30/17)			
West Abutment Totalizer	4.09	5.91	gpm
West Abutment Weir	0.75	1.50	gpm
P-226	6.49[1]		gpm
Tanner Wash Totalizer[2]	3.07	8.55	gpm
Petroglyph	6.38	8.22	gpm

[1]The P-226 totalizer meter was out of service during the December 2016 and March 2017 reading periods before being replaced on June 29, 2017. The 6.49 gpm value represents the September 22, 2017 reading and is the only available reading during the current review period.

[2]The Tanner Wash totalizer meter was replaced on June 28, 2017.

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

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 settlement surveys use a base point near the dam (bottom ash base point 1000) that had originally been calibrated to the NGS Randell 2 monument in Joseph City, Arizona prior to 1990. In June 2010, bottom ash base point 1000 was recalibrated to the Randell 2 monument and the resulting raw data from the 2010 survey include all differential movement between these two survey points over a time frame of more than 10 years. Settlement surveys conducted since 2010 indicate little to no movement at the survey monuments.

The data for the totalizers and seeps during the current review period indicates that the seepage flow rates have not significantly increased since the totalizers were last reset/replaced.

5.2.3 CCR and Water Elevations

The CCR and water elevations of the CCR unit at the time of the inspection are recorded on the Field Inspection form presented in Section 4.2.

The approximate minimum water level in the Bottom Ash Pond during the October 1, 2016 – September 30, 2017 review period is EL 5108.00 feet. The approximate maximum water level in the Bottom Ash Pond during the October 1, 2016 – September 30, 2017 review period is EL 5111.58 feet.

The minimum CCR level in the Bottom Ash Pond during the October 1, 2016 – September 30, 2017 review period is below EL 5108.00 feet. The approximate maximum CCR level in the Bottom Ash Pond during the October 1, 2016 – September 30, 2017 review period is EL 5122

feet (based on visual inspection near the divider dike). The CCR in the Bottom Ash Pond is removed from selected areas within the impoundment and placed in the Bottom Ash Monofill, resulting in variable CCR and water elevations throughout the year.

5.2.4 Storage Capacity

The estimated remaining storage capacity of the CCR unit at the time of the inspection was 675 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 1,625 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 2016 inspection.

5.3 SEDIMENTATION POND

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 2016. The CCR in the pond was cleaned out and taken to the Bottom Ash Monofill in 2017. This cleaning changed the internal geometry, thus increasing the available storage. The Sedimentation Pond is occasionally cleaned for operational use.

5.3.2 Instrumentation

There are no instruments associated with the Sedimentation Pond.

5.3.3 CCR and Water Elevations

The depth of water in the Sedimentation Pond at the time of the inspection was approximately 3.5 feet in the south cell, which corresponds to an elevation of 5010.5 feet, and 5.5 feet in the north cell, which corresponds to an elevation of 5012.5 feet.

Since the CCR unit is periodically emptied, the impounded CCR elevation varies throughout the year.

5.3.4 Storage Capacity

The estimated remaining storage capacity of the Sedimentation Pond at the time of the inspection was 6.59 ac-ft.

5.3.5 Approximate Impounded Volume at Time of Inspection

The approximate volume of impounded CCR in the Sedimentation Pond at the time of the inspection was 3.98 ac-ft. Since the CCR unit is periodically emptied, the impounded CCR volume varies throughout the year.

5.3.6 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 2016 inspection.

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 unit since the last inspection in 2016.

5.4.2 Instrumentation

There are no instruments associated with the Bottom Ash Monofill.

5.4.3 CCR Volume

The CCR elevations at the time of the inspection are recorded on the Field Inspection form presented in Section 4. Based on the planned fill rate, the CCR unit contained between 1,180 and 1,330 ac-ft at the time of inspection (survey data is not available). 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.

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 2016 inspection.

6.0 OPERATION AND MAINTENANCE RECOMMENDATIONS

The following items were noted during inspections as requiring attention.

6.1 FLY ASH DAM

Action Item	Action Status
1) Identify and remediate scattered animal burrows.	1) Mark animal burrows identified during weekly inspections. 2) Establish regular schedule (e.g. semi-annually) to remediate identified burrows. NOTE: This will always be an ongoing maintenance activity.
2) Continue monitoring the groin of the North Abutment and the access road near the Geronimo sumps for erosion.	Repair as needed.
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.

6.2 BOTTOM ASH DAM

Action Item	Action Status
1) Monitor the existing erosion holes in the crest and record when/if new erosion holes are observed.	Repair as needed.
2) Identify and remediate scattered animal burrows.	1) Mark animal burrows identified during weekly inspections. 2) Establish regular schedule (e.g. semi-annually) to remediate identified burrows. NOTE: This will always be an ongoing maintenance activity.
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) Remove vegetation and debris from the V-notch weir at the West Abutment.	Location is currently obscured and access restricted. Location should be cleared so that it can be accessed and measured during regular inspections. Add to maintenance work list and repair as needed.

6.3 SEDIMENTATION POND

Action Item	Action Status
1) Monitor the erosion around the outfall structure and the surface of the CCR unit.	Repair as needed.

6.4 BOTTOM ASH MONOFILL

Action Item	Action Status
1) There is evidence of head cutting in the inlet to the Stormwater Detention Basin, erosion along the west slope, and an erosion channel forming in the northwest corner of the structure.	Monitor and repair erosion as needed. NOTE: This will always be an ongoing maintenance activity.

7.0 REFERENCES

United States Environmental Protection Agency (EPA), 2015. *40 CFR Parts 257 and 261 – Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*. Federal Register Vol. 80, No. 74. April 17.

Federal Emergency Management Agency. 2005. *Technical Manual for Dam Owners, Impacts of Plants on Earthen Dams, FEMA Manual 534*. September.

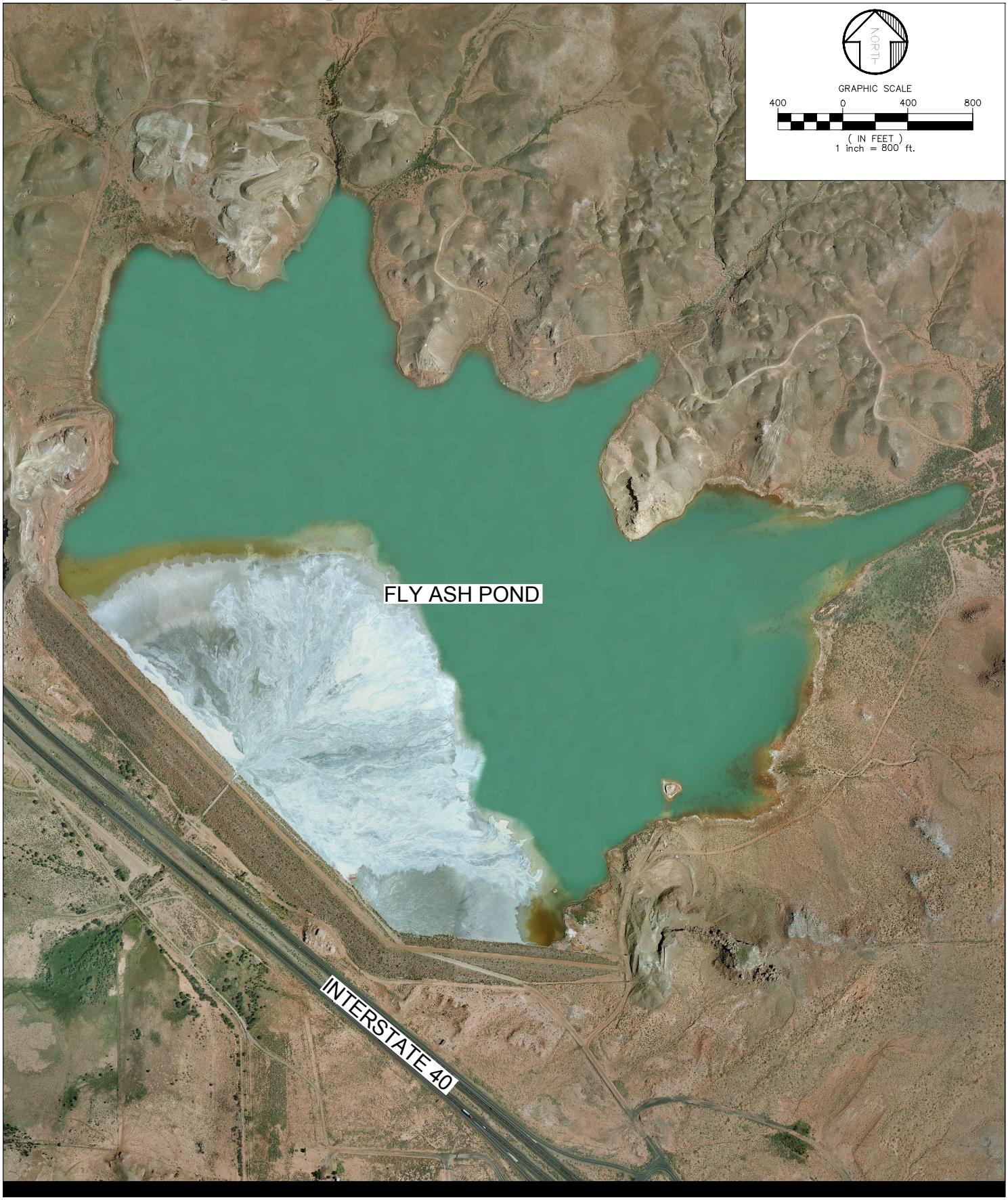
National Geodetic Survey. Web. 2017. <http://www.ngs.noaa.gov/cgi-bin/ds_desig.prl>. 27 November.

New Mexico Office of the State Engineer (NMOSE). Dam Safety Bureau. 2011. *Vegetation Management on Dams*. 3 pgs. August 15.

Weather Underground, Web. 2017. "Weather History for Winslow, AZ." <https://www.wunderground.com/history/airport/KINW/2017/11/16/DailyHistory.html?&reqdb.zip=&reqdb.magic=&reqdb.wmo=>. 28 November.

FIGURES

Last saved by: LEE.WRIGHT(2016-11-28) Last Plotted: 2016-11-28
Filename: P:\PROJECTS\ARIZONA_PUBLIC_SERVICE\60522480_FC-CH DAM INSPECTION\900-CAD-GIS\910-CAD\25-SKETCHES\A21182 - 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(2016-11-28) Last Plotted: 2016-11-28
Filename: P:\PROJECTS\ARIZONA_PUBLIC_SERVICE\60522480_FC-CH DAM INSPECTION\900-CAD-GIS\910-CAD\25-SKETCHES\A21183 - FIGURE 2 - BAP.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(2016-11-28) Last Plotted: 2016-11-28 ANSI A 8.5" x 11"
Filename: P:\PROJECTS\ARIZONA_PUBLIC_SERVICE\60522480_FC-CH DAM INSPECTION\900-CAD-GIS\910-CAD\25-SKETCHES\A21184 - 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(2016-11-28) Last Plotted: 2016-11-28
Filename: P:\PROJECTS\ARIZONA_PUBLIC_SERVICE\60522480_FC-CH DAM INSPECTION\900-CAD-GIS\910-CAD\25-SKETCHES\A21185 - FIGURE 4 - BAM.DWG
ANSI A 8.5" x 11"



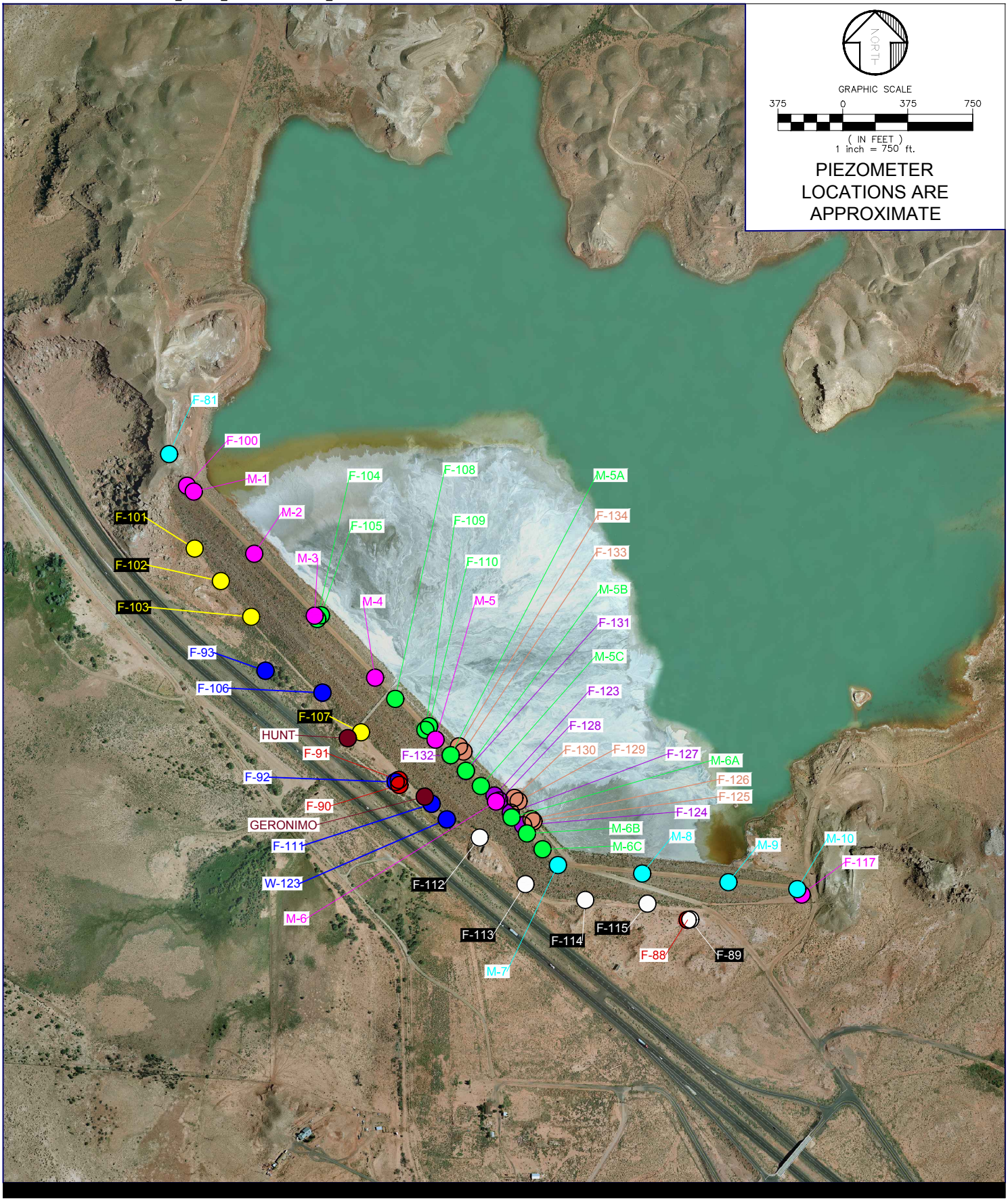
CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

BOTTOM ASH MONOFILL
SITE MAP

AECOM

FIGURE 4

Last saved by: LEE.WRIGHT(2016-11-28) Last Plotted: 2016-11-28 ANSI A 8.5" x 11"
Filename: P:\PROJECTS\ARIZONA_PUBLIC_SERVICE\60522480_FC-CH DAM INSPECTION\900-CAD-GIS\910-CAD\25-SKETCHES\A21169 - FIGURE 5 - FLY ASH POND INSTRUMENTS.DWG



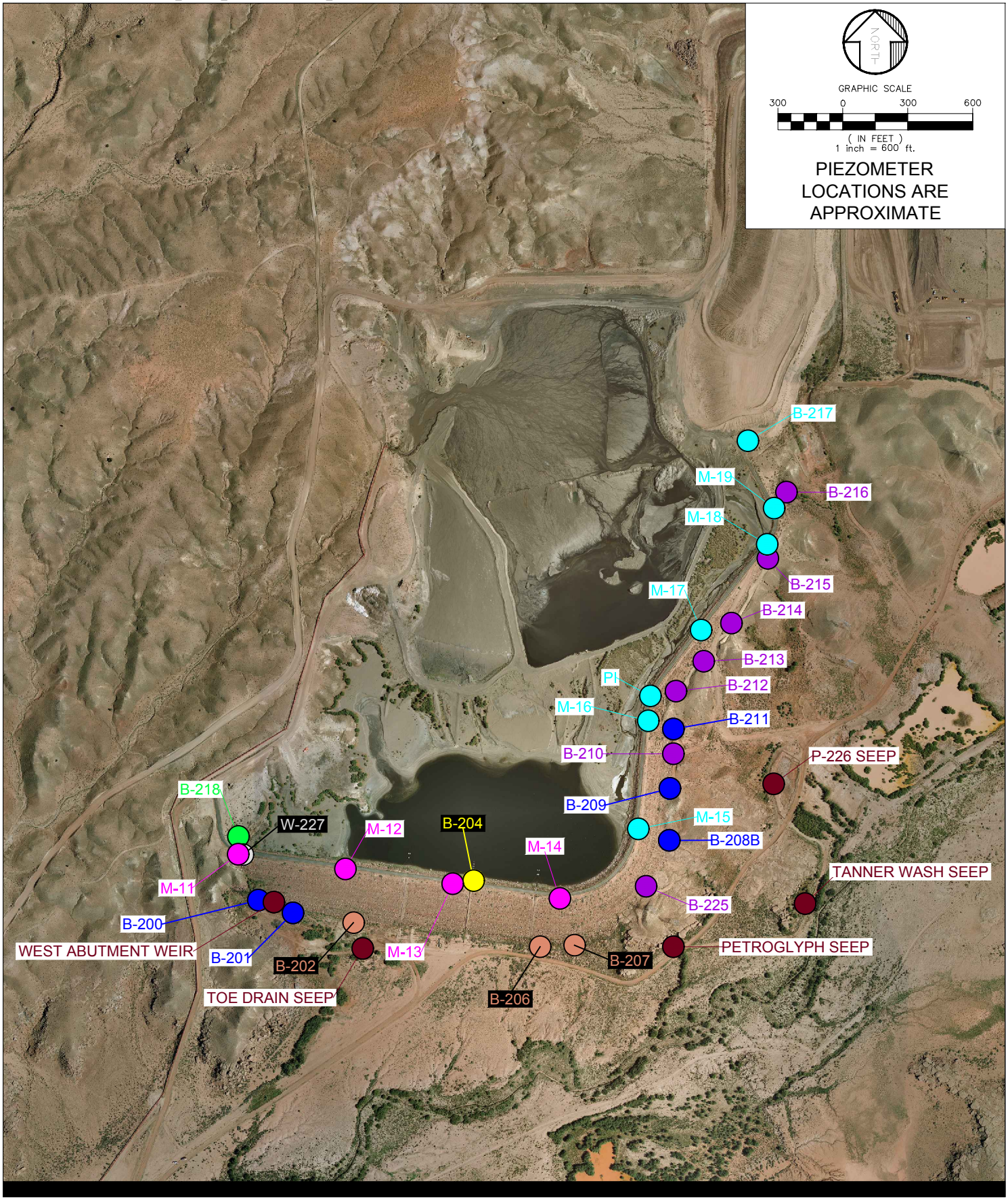
CHOLLA POWER PLANT
CCR IMPOUNDMENT AND LANDFILL INSPECTION REPORT
ARIZONA PUBLIC SERVICE

FLY ASH POND
INSTRUMENTATION MAP

AECOM

FIGURE 5

Last saved by: LEE.WRIGHT(2016-11-28) Last Plotted: 2016-11-28
Filename: P:\PROJECTS\ARIZONA_PUBLIC_SERVICE\60522480_FC-CH DAM INSPECTION\900-CAD-GIS\910-CAD\25-SKETCHES\A21170 - FIGURE 6 - BAP INSTRUMENTS.DWG
ANSI A 8.5" x 11"



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

BOTTOM ASH POND
INSTRUMENTATION MAP

AECOM

FIGURE 6

APPENDIX A

FLY ASH DAM PHOTO LOG



20171116 – IMG_5938
The crest of the Fly Ash Dam, facing west from the East Abutment.



20171116 – IMG_5939
The downstream slope of the Fly Ash Dam, facing west from the East Abutment.



20171116 – IMG_5945
The upstream slope of the Fly Ash Dam, facing northwest from the East Embankment.



20171116 – IMG_5947
The crest of the East Embankment, facing east.



20171116 – IMG_5954
Erosion along the upstream side of the Fly Ash Dam.



20171116 – IMG_5955
Ant hills in the center of the crest.



20171116 – IMG_5957
The upstream slope of the Fly Ash Dam, facing northwest.



20171116 – IMG_5958
The inlet pipe depositing CCR into the impoundment.



20171116 – IMG_5959
The crest of the Fly Ash Dam, facing northwest from the center of the embankment.



20171116 – IMG_5962
The inlet pipe system facing toward the downstream slope.



20171116 – IMG_5963
The crest and downstream slope of the Fly Ash Dam, from center, facing southwest.



20171116 – IMG_5968
The inlet pipe system with repaired pipe supports.



20171116 – IMG_5970
The upstream slope near the North Abutment, facing northwest.



20171116 – IMG_5977
The downstream toe of the Fly Ash Dam, facing south from the North Abutment.



20171116 – IMG_5980
The upstream slope of the Fly Ash Dam, facing east.



20171116 – IMG_6017
The survey location for the water level readings.



20171116 – IMG_6018
The south toe and upstream slope of the East Embankment, facing west.



20171116 – IMG_6025
The toe of the Fly Ash Dam, facing north.



20171116 – IMG_6034
The inlet pipes reconfigured to circulate water.



20171116 – IMG_6039
The north toe of the Fly Ash Dam, facing north.



20171116 – IMG_6041
The North Abutment of the Fly Ash Dam, facing north from the toe.



20171116 – IMG_6043
The I-40 Seep in a relatively soft, but dry condition.

APPENDIX B

BOTTOM ASH DAM PHOTO LOG



20171116 – IMG_5757
Ash and water being deposited into the Bottom Ash Pond.



20171116 – IMG_5786
The crest of the Bottom Ash Dam, facing east.



20171116 – IMG_5793
An animal burrow along the crest of the South Embankment.



20171116 – IMG_5794
An animal burrow in the crest of the South Embankment.



20171116 – IMG_5795
The western siphon line in the Bottom Ash Pond, facing upstream.



20171116 – IMG_5798
The western siphon line in the Bottom Ash Pond, facing downstream.



20171116 – IMG_5801
Corrosion on the pipe from Toe Drain Seep at the western siphon line.



20171116 – IMG_5803
The downstream slope of the South Embankment, facing east.



20171116 – IMG_5804
The downstream slope of the South Embankment, facing west.



20171116 – IMG_5805
The upstream slope of the South Embankment, facing west.



20171116 – IMG_5822
The downstream slope of the South Embankment, facing west.



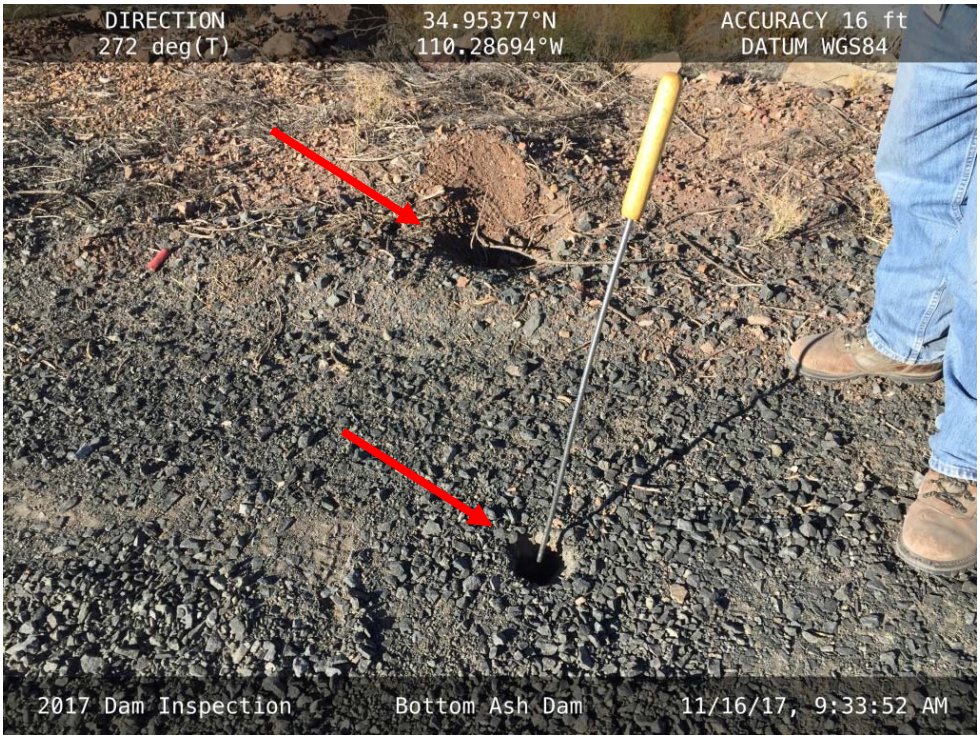
20171116 – IMG_5824
The upstream slope of the southeast corner, facing east.



20171116 – IMG_5825
An animal burrow in the downstream slope of the southwest corner.



20171116 – IMG_5839
The downstream slope of the East Embankment, facing north.



20171116 – IMG_5841
Two erosion holes in the crest of the East Embankment.



20171116 – IMG_5844
The downstream slope of the East Embankment, facing south.



20171116 – IMG_5850
The crest of the East Embankment, facing north.



20171116 – IMG_5856
A settlement monument along the East Embankment exposed after crest grading activities.



20171116 – IMG_5859
An erosion hole in the crest of the East Embankment.



20171116 – IMG_5873
Trees growing in impounded ash at the West Abutment, facing west.



20171116 – IMG_5881
The toe of the South Embankment, facing east.



20171116 – IMG_5883
Grassy vegetation growing near the West Abutment Weir, facing west.



20171116 – IMG_5896
Grassy vegetation growing near the Petroglyph Seep, facing north.



20171116 – IMG_5909
The toe of the East Embankment, facing south.



20171116 – IMG_5916
The toe of the South Embankment with most of the vegetation removed, facing west.



20171116 – IMG_5922
The stump of a tree left over after vegetation removal activities.



20171116 – IMG_5923
The toe of the South Embankment with most of the vegetation removed, facing east.



20171116 – IMG_5927
The toe of the South Embankment with most of the vegetation removed, facing west.

APPENDIX C

SEDIMENTATION POND PHOTO LOG



20171116 – IMG_6051
The southern slope of the southern cell, facing east.



20171116 – IMG_6052
The divider wall in the Sedimentation Pond, facing northeast.



20171116 – IMG_6053
The northern cell of the Sedimentation Pond, facing northeast.



20171116 – IMG_6055
The northern cell of the Sedimentation Pond, facing northeast.



20171116 – IMG_6060
The spillway along the southern cell of the Sedimentation Pond, facing southwest.



20171116 – IMG_6064
The upstream slope of the southern cell along the east side, facing north.



20171116 – IMG_6065
Canal between the railroad tracks (left) and the Sedimentation Pond (right), facing southwest.



20171116 – IMG_6068
Erosion around the concrete spillway along the south embankment.



20171116 – IMG_6070
Erosion around the concrete spillway along the south embankment.



20171116 – IMG_6071
Erosion along the concrete and an erosion hole near the spillway along the south embankment.



20171116 – IMG_6074
The north side of the divider wall in the Sedimentation Pond, facing south.



20171116 – IMG_6077
The northern cell of the Sedimentation Pond, facing west from the east embankment.



20171116 – IMG_6078
The northern portion of the Sedimentation Pond, facing west from the east embankment.



20171116 – IMG_6079
The western portion of the northern cell in the Sedimentation Pond, facing south.

APPENDIX D

BOTTOM ASH MONOFILL PHOTO LOG



20171116 – IMG_5722
Erosion rills along the western slope of the Bottom Ash Monofill, facing east.



20171116 – IMG_5725
Erosion on the north side of the western slope, facing east.



20171116 – IMG_5727
The diversion channel along the west side of the Bottom Ash Monofill, facing northeast.



20171116 – IMG_5728
The diversion channel along the west side of the Bottom Ash Monofill, facing south.



20171116 – IMG_5730
The southeast corner of the Bottom Ash Monofill, facing south.



20171116 – IMG_5738
Headcutting on the east side of the Stormwater Detention Basin, facing west.



20171116 – IMG_5741
Headcutting on the west side of the Stormwater Detention Basin, facing west.



20161019 – IMG_5748
Minor erosion rills along the eastern side of the Bottom Ash Monofill, facing west.



20171116 – IMG_5750
The south side of the Bottom Ash Monofill, facing northeast.



20171116 – IMG_5754
The top of the Bottom Ash Monofill, facing south.