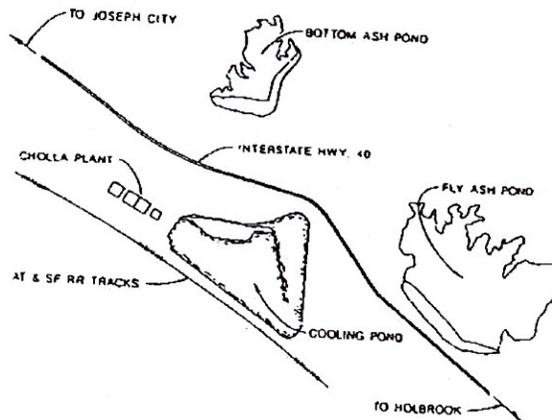


CHOLLA POWER PLANT Fly Ash Dam, Bottom Ash Dam, Sedimentation Pond, and Bottom Ash Monofill

Annual CCR Impoundment and Landfill Inspection Report

2018



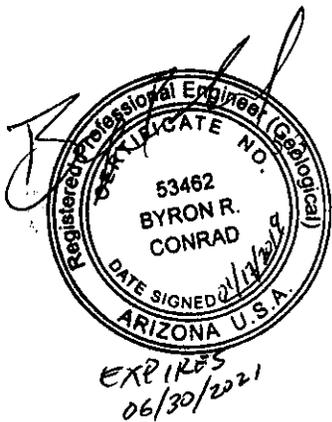
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EXPIRES
06/30/2021

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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

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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 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 sludge (FGD). 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 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 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 Monday, October 22 and Tuesday, October 23, 2018. Conditions were mild (54-74 degrees Fahrenheit). The sky was mostly clear on Monday and overcast on Tuesday. Winds were light both days. Light rain fell on Tuesday morning and approximately 10.35 inches of precipitation had fallen since the start of the year based on data recorded near Holbrook, Arizona (Weather Underground 2018). Units 1 and 4 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 Survey System (GPS). 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 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 UNIT 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 normal operating water level is elevation (EL) 5114 feet and the water level was measured most recently by survey to be at EL 5088.835 feet on October 23, 2018. 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.

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 5111.0 feet during the inspection on October 22, 2018.

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 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. 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 5019.0 feet (NGVD29) and the water level was observed to be at approximate EL 5012.3 feet in the south cell and approximate EL 5014.0 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 5,261.0 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 2018 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

Fly Ash Dam		State Identification Number (SID): 09.28								
SID: 09.28	Dam Name: Fly Ash Dam	Type: Earth	Purpose: Fly ash disposal		Not Applicable	No	Yes	Monitor	Repair	Investigate
Contact(s): Byron Conrad, P.E. (APS)		Report Date: January 11, 2019								
Inspected by: Byron Conrad, P.E. (APS) Lee Wright, P.E. (AECOM)		Inspection Date: October 22, 2018								
Reviewed by: Byron Conrad, P.E. (APS)		Review Date: January 7, 2019								
Design Dam Crest Elevation (ft): 5,120		Design Spillway Crest Elevation: None								
Design Total Freeboard (ft): 6		Measured Total Freeboard (ft): ~31								
Statutory Dam Height (ft): 80		Structural Height (ft): 80								
Dam Crest Length (ft): 4,583		Upstream Slope: 3:1	Downstream Slope: 3:1							
Dam Crest Width (ft): 24		Lat: 34° 56' 10.0" N	Water Rights: N/A							
		Long: 110° 16' 06.0" W								
Reservoir Area (acres): 420		Reservoir Storage (ac-ft): 18,000								
Inflow Design Flood/Safe Flood-Passing Capacity: PMF – fully contained										
Reservoir Level During Inspection (ft): EL 5088.835 (October 23, 2018)		Photos: Yes	Pages: 4							
Estimated Solids Level (ft): ~ EL 5094.8 at the discharge pipe										

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 2019										

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 report: January 2018 (for 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?										
b	Misalignment?										
c	Longitudinal/Transverse cracking?										
d	Animal burrows? Ant hills were observed at various locations across the crest (Photo IMG_0453).				X	X	X				
e	Adverse vegetation?										
f	Erosion?										
4	UPSTREAM SLOPE										
a	Erosion? Minor erosion and soil wasting observed along the upstream slope. See comment ii.				X	X					
b	Inadequate ground cover?										
c	Adverse vegetation? Continue removing adverse vegetation.				X		X				
d	Longitudinal/Transverse cracking?										
e	Inadequate riprap?										
f	Stone deterioration? Minor wasting observed. See comment iii.				X	X					
g	Settlements, slides, depressions, bulges?										
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?	Major erosion previously observed along the downstream toe was not observed during this inspection.		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 wasting observed. 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	X		
b	Differential movement?			X						
c	Cracks?			X						
d	Settlements, slides, depressions, bulges?			X						
e	Seepage?	Historic seepage has been observed downstream of the Northwest 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. 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?			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?	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 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_0439). This method is sufficient so long as the water level continues to remain low.
- ii. Minor erosion was observed along the upstream slope of the southern 1/8th of the West Embankment (Photo IMG_0463). The erosion observed during this inspection is in the same vicinity as erosion observed during the 2017 inspection. The erosion does not appear to be significantly worse since the 2017 inspection, but should be monitored. Additionally, minor soil wasting was observed along the upstream slope near the Northwest Abutment (Photo IMG_0499). The soil wasting should be monitored and repaired if it continues.
- iii. Minor stone deterioration was also observed during previous inspections.
- iv. Minor erosion was observed at the Northwest Abutment contact (Photos IMG_0502 and IMG_0542). The erosion should be monitored and repaired if the depth exceeds 1 foot.
- 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; however, the I-40 seep and historic seepage areas downstream of the West Embankment were dry. The I-40 seep was drier during this inspection than it had been during previous inspections (Photo IMG_0553).
- vi. Continue removing excessive natural vegetation in accordance with APS's preferred protocol, APS's preferred protocol, the NMOSE "*Vegetation Management on Dams*" (2011) document.
- vii. The weekly inspection reports for the period between October 1, 2017 and September 30, 2018 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 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 11, 2019								
Inspected by: Byron Conrad, P.E. (APS), Lee Wright, P.E. (AECOM)		Inspection Date: October 22, 2018								
Reviewed by: Byron Conrad, P.E. (APS)		Review Date: January 7, 2019								
Design Dam Crest Elevation (ft): 5,123.3		Design Spillway Crest Elevation: None								
Design Total Freeboard (ft): 5.5		Measured Total Freeboard (ft): 12.3								
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): 5111.0		Photos: Yes	Pages: 4							
Estimated Solids Level (ft): Varies – approximate EL 5115 feet (based on visual observations of ash removal activities)										

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 2019										

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 report: January 2018 (for 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?										
b	Misalignment?										
c	Longitudinal/Transverse cracking?										
d	Animal burrows? Scattered ant hills were observed (Photo IMG_0362). Monitor and remove.										
e	Adverse vegetation?										
f	Erosion? See comment i.										
4	UPSTREAM SLOPE										
a	Erosion? Minor erosion near the crest observed. See comment ii.										
b	Inadequate ground cover?										
c	Adverse vegetation? There is vegetation in the pond near the West Abutment (Photo IMG_0275).										
d	Longitudinal/Transverse cracking?										
e	Inadequate riprap?										
f	Stone deterioration?										
g	Settlements, slides, depressions, bulges?										
h	Animal burrows? None observed. Continue to monitor.										

Bottom Ash Dam		SID: 09.27		N/A	No	Yes	Mon	Rep	Inv
5	DOWNSTREAM SLOPE								
a	Erosion?	See comment iii.			X	X			X
b	Inadequate ground cover?			X					
c	Adverse vegetation?	Several large bushes were observed on the downstream slope (Photo IMG_0318).			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 iv.			X	X			
i	Movement at or beyond toe?			X					
j	Animal burrows?	None observed. Continue to monitor.		X		X			
6	ABUTMENT CONTACTS								
a	Erosion?			X					
b	Differential movement?			X					
c	Cracks?			X					
d	Settlements, slides, depressions, bulges?			X					
e	Seepage?	Yes. Measured approximately 2 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 iv.			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 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. Several erosion holes were observed in the crest of both the South and East Embankments. Erosion holes in the South Embankment and southeast corner crest are scattered (Photos IMG_0281, IMG_0294, IMG_0304, and IMG_0325) while erosion holes in the East Embankment crest (Photos IMG_0341 and IMG_0343) are clustered near settlement monument M-16. However, settlement monuments M-15, M-16, and PI do not indicate abnormal or sudden movement over the previous 12 months. The erosion holes should be repaired and the area should be monitored for additional erosion.
- ii. Shallow erosion rills were observed in isolated locations along the South Embankment crest (Photos IMG_0280 and IMG_0283). These areas should be monitored and repaired if they are observed to exceed a depth of 1 foot.
- iii. Minor erosion, soil wasting, and erosion gullies were observed:
 - a. Minor erosion was observed on the downstream slope around the concrete encasement for the central siphon lines (Photo IMG_0296).
 - b. Soil erosion was observed along the downstream slope of the East Embankment, near piezometer B-215 and settlement monument M-18 (Photo IMG_0373). The sediment is collecting in a diversion ditch between the access road and the embankment. The source of the sediment (crest, slope, riprap decomposition) should be investigated and repaired if it is determined that the erosion would affect the integrity of the embankment.
 - c. Two erosion gullies were observed on the downstream slope along the northern half of the East Embankment. The northern erosion gully (Photo IMG_0376) did not appear to be significantly deeper or more extensive compared to previous inspections. The southern erosion gully (Photo IMG_0381) had not been observed during previous inspections. Both locations should be repaired.
- iv. Soft spots and boggy areas were observed along the downstream toe in locations of known and active seepage (e.g. the Petroglyph seep, the Bottom Ash Weir, and the P-232 seepage intercept area). Water in the Bottom Ash Toe Drain sump appeared to be turbid during the inspection. Water in the Petroglyph sump appeared to be relatively clearer than the water in the Bottom Ash Toe Drain sump during the inspection.
- v. The weekly inspection reports for the period between October 1, 2017 and September 30, 2018 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.
- vi. 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.

4.3 APS FIELD INSPECTION – SEDIMENTATION POND

Sedimentation Pond		State Identification Number (SID): N/A				
SID: N/A	Dam Name: Sedimentation Pond	Type: Earth	Purpose: CCR-Impacted Surface Water Collection			Not Applicable No Yes Monitor Repair Investigate
Contact(s): Byron Conrad, P.E. (APS)		Report Date: January 11, 2019				
Inspected by: Byron Conrad, P.E. (APS), Lee Wright, P.E. (AECOM)		Inspection Date: October 23, 2018				
Reviewed by: Byron Conrad, P.E. (APS)		Review Date: January 7, 2019				
Design Dam Crest Elevation (ft): 5019		Design Spillway Crest Elevation: Twin 16-inch corrugated polyethylene pipes, ungated, with trash rack				
Design Total Freeboard (ft): 2		Measured Total Freeboard (ft): 6.7 (south cell) 5.0 (north cell)				
Statutory Dam Height (ft): 11		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)				
Dam Crest Length (ft): 1,100		Upstream Slope: 1.5:1 (by inspection)	Downstream Slope: 1.5:1 (by inspection)			
Dam Crest Width (ft): 24		Lat: 34° 56' 29.9"N	Water Rights: N/A			
		Long: 110° 18' 14.9"W				
Reservoir Area (acres): 1.6		Reservoir Storage (ac-ft): 10.7				
Inflow Design Flood/Safe Flood-Passing Capacity: Not Calculated						
Reservoir Level During Inspection (ft): 5012.3 (south cell) 5014.0 (north cell)		Photos: Yes	Pages: 4			
Estimated Solids Level (ft): Below EL 5012.3 (south cell) ~5014.5 (north cell)						

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: October 2019										

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 report: January 2018 (for 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?										
				X							
e	Adverse vegetation?										
				X							
f	Erosion?										
				X							
4	UPSTREAM SLOPE										
a	Erosion? The upstream slope appears to be steeper than the 3H:1V design slope.										
				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?										
				X							

Sedimentation Pond		SID: N/A		N/A	No	Yes	Mon	Rep	Inv
5	DOWNSTREAM SLOPE								
a	Erosion?	Minor erosion around the outlet structure.							
b	Inadequate ground cover?		X			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?		X						
6	ABUTMENT CONTACTS								
Abutments are not defined due to general grading in the area.									
a	Erosion?		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.							
d	Floating debris present?	Trash and debris were observed in the north cell.							
e	Depressions, sinkholes, or vortices?			X					
f	Low ridges/saddles allowing overflow?	There is a concrete weir separating the north cell from the south cell.							
g	Structures below dam crest elevation?	Yes, two 16-inch corrugated polyethylene pipe outlets in the south chamber (see Photo IMG 0656).							

Additional comments and recommendations for the Sedimentation Pond:

- i. The upstream slopes appear to be steeper than the design slope; however, this may be due to previous excavation activities and is not necessarily an indication of slope instability.
- ii. Minor erosion was observed along the edges of the concrete outfall structure (Photos IMG_0656 and IMG_0659). The erosion did not appear to be worse compared to previous inspections. Continue monitoring.
- iii. The weekly inspection reports for the period between October 1, 2017 and September 30, 2018 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

Bottom Ash Monofill		State Identification Number (SID): N/A							
SID: N/A	Landfill Name: Bottom Ash Monofill	Type: Landfill	Purpose: Permanent Storage of Dry Bottom Ash Dredged from Bottom Ash Pond	Not Applicable	No	Yes	Monitor	Repair	Investigate
Contact(s): Byron Conrad, P.E. (APS)		Report Date: January 11, 2019							
Inspected by: Byron Conrad, P.E. (APS), Lee Wright, P.E. (AECOM)		Inspection Date: October 22, 2018							
Reviewed by: Byron Conrad, P.E. (APS)		Review Date: January 7, 2019							
Design Maximum Ash Elevation (ft): 5261		Current Ash Elevation: 5184 feet for capped west portion, 5116 feet for east portion.							
Dam Crest Length (ft): Not a dam, not applicable.		Design Side Slope: 4:1 (Final)	Observed Side Slope: 3:1, steeper (2:1) towards the south end of the west side.						
Dam Crest Width (ft): Not a dam, not applicable.		Lat: 34° 57' 35.4"N	Water Rights: N/A						
		Long: 110° 17' 06.3"W							
Landfill Area (acres): 43 (maximum permitted area)		Landfill Capacity (ac-ft): 2,417							
Inflow Design Flood/Safe Flood-Passing Capacity: Diversion of 100-year, 24-hour run-on storm									
Photos: Yes		Pages: 2							

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 2018 (for 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?			X				
b	Cracking?			X				
c	Run on control?				X			
d	Run off control?				X			
e	Erosion? Yes. See comments ii and iii.				X	X	X	
f	Dust control issues?			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. An erosion gully approximately 2.5 feet deep was observed on the eastern side of the top of the CCR unit (Photo IMG_0565). The erosion gully was observed to extend into the bottom ash underlying the cover soil. This location did not immediately appear to be an area where precipitation runoff concentrates; however, the gully should be repaired and the area should be monitored for instances of future erosion. Additional minor erosion rills were observed across the CCR unit (Photos IMG_0575, IMG_0595, and IMG_0628). The minor erosion rills should be monitored and repaired if they exceed 1 foot in depth.
- iii. Significant erosion was observed in the northwest corner and east side of the Stormwater Detention Basin (Photos IMG_0607, IMG_0620, and IMG_0626). The erosion in both locations was observed to extend deeper and further upslope compared to previous inspections. These areas should be repaired.
- iv. The weekly inspection reports for the period between October 1, 2017 and September 30, 2018 indicate the following:
 - a. Signs of erosion on the landfill were observed to require repair on December 19, 2017. The erosion was repaired prior to the December 21, 2017 inspection.
- v. The weekly inspection reports do not indicate that there were any appearances of actual or potential structural weakness or other conditions that have the potential to disrupt the operation or safety of the CCR unit.

5.0 DATA REVIEW

5.1 FLY ASH DAM

5.1.1 Geometry Changes Since Last Inspection

There have not been any significant changes to the geometry of the unit since the last inspection in 2017.

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, 2017 – September 30, 2018 (current) review period are reported in the following table:

Instrument Name	Minimum	Maximum	Unit
Open Standpipe Piezometers (10/1/17 to 9/30/18)			
F-81	5058.76	5059.56	EL (ft)
F-88	4999.88	5003.20	EL (ft)
F-89	5057.39	5059.02	EL (ft)
F-90	4992.81	4994.97	EL (ft)
F-91	5002.47	5006.83	EL (ft)
F-92	5010.37	5012.59	EL (ft)
F-93	5017.19	5017.82	EL (ft)
F-100	5079.47	5081.37	EL (ft)
F-101	5049.34	5050.65	EL (ft)
F-102	5025.46	5026.23	EL (ft)
F-103	5017.58	5018.07	EL (ft)
F-104	5064.64	5066.77	EL (ft)
F-105	5085.60	5091.35	EL (ft)
F-106	5015.06	5016.71	EL (ft)
F-107	5024.42	5025.58	EL (ft)
F-108	5056.74	5058.44	EL (ft)
F-109	5034.69	5035.63	EL (ft)
F-110	5087.18	5090.01	EL (ft)
F-111	5030.06	5030.70	EL (ft)
F-112	5026.85	5027.33	EL (ft)
F-113	5040.34	5041.23	EL (ft)
F-114	Dry	Dry	EL (ft)
F-115	5031.24	5031.83	EL (ft)

Instrument Name	Minimum	Maximum	Unit
F-117	5084.18	5086.62	EL (ft)
F-123	5085.89	5087.15	EL (ft)
F-124	5087.09	5087.58	EL (ft)
F-125	Dry	Dry	EL (ft)
F-126	5078.06	5081.28	EL (ft)
F-127	5071.63	5074.32	EL (ft)
F-128	5090.98	5092.58	EL (ft)
F-129	5084.56	5087.69	EL (ft)
F-130	5075.92	5079.24	EL (ft)
F-131	5056.70	5059.51	EL (ft)
F-132	5087.66	5088.52	EL (ft)
F-133	5081.63	5085.43	EL (ft)
F-134	5062.71	5064.79	EL (ft)
W-123	5036.09	5037.72	EL (ft)
Settlement Monuments (10/1/17 to 9/30/18)			
M-1	5120.923	5120.978	EL (ft)
M-2	5120.422	5120.491	EL (ft)
M-3	5119.810	5119.861	EL (ft)
M-4	5118.853	5119.043	EL (ft)
M-5	5117.959	5118.026	EL (ft)
M-5A	5117.745	5117.797	EL (ft)
M-5B	5117.577	5117.646	EL (ft)
M-5C	5117.918	5117.963	EL (ft)
M-6	5119.015	5119.086	EL (ft)
M-6A	5118.681	5118.726	EL (ft)
M-6B	5119.664	5119.721	EL (ft)
M-6C	5120.030	5120.075	EL (ft)
M-7	5119.505	5119.531	EL (ft)
M-8	5119.594	5119.643	EL (ft)
M-9	5120.013	5120.053	EL (ft)
M-10	5119.930	5120.001	EL (ft)
Totalizers (10/1/17 to 9/30/18)			
Gerónimo	10.40	27.61	gpm
Hunt	0.47	10.22	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 data for the totalizers during the current review period indicates that the seepage flow rates have decreased slightly 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 approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection (the October 1, 2017 – September 30, 2018 timeframe) is presented in the following table:

Water	Depth of Water (ft)	Water Elevation (ft)	Measurement Location
Minimum	18.565	5088.565	Northeast Area of Pond
Maximum	20.807	5090.807	Northeast Area of Pond
Present (this inspection)	18.835	5088.835	Lathe in Northwest Area of Pond
CCR	Depth of CCR (ft)	CCR Elevation (ft)	Measurement Location
Minimum	54.8	~5094.8 (2018 inspection)	Inlet Pipe
Maximum	55.0	5095 (2017 inspection)	Inlet Pipe
Present (this inspection)	54.8	~5094.8	Inlet Pipe

Water depths are based on a minimum ash/ground elevation in the Fly Ash Pond equal to EL 5070 feet approximated using 2015 bathymetry.

5.1.4 Storage Capacity

The estimated remaining storage capacity of the CCR unit at the time of the inspection was 10,250 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 7,750 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 2017 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 2017.

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, 2017 – September 30, 2018 (current) review period are reported in the following table:

Instrument Name	Minimum	Maximum	Unit
Open Standpipe Piezometers (10/1/17 to 9/30/18)			
B-200	5045.86	5048.62	EL (ft)
B-201	5043.28	5045.42	EL (ft)
B-202	5040.39	5041.86	EL (ft)
B-204	5097.45	5099.84	EL (ft)
B-206	5028.41	5029.54	EL (ft)
B-207	5031.07	5032.21	EL (ft)
B-208B	Dry	Dry	EL (ft)
B-209	5072.23	5072.64	EL (ft)
B-210	5066.40	5067.04	EL (ft)
B-211	Dry	Dry	EL (ft)
B-212	5090.56	5091.43	EL (ft)
B-213	5079.81	5080.50	EL (ft)
B-214	5078.97	5079.89	EL (ft)
B-215	5077.86	5079.53	EL (ft)
B-216	5072.18	5072.86	EL (ft)
B-217	5100.98	5102.57	EL (ft)
B-218	5093.44	5094.48	EL (ft)
B-225	5058.71	5059.54	EL (ft)
W-227	5090.18	5091.64	EL (ft)
Settlement Monuments (10/1/17 to 9/30/18)			
M-11	5123.281	5123.358	EL (ft)
M-12	5122.820	5122.906	EL (ft)
M-13	5122.752	5122.811	EL (ft)
M-14	5119.385	5119.437	EL (ft)
M-15	5122.998	5123.058	EL (ft)

Instrument Name	Minimum	Maximum	Unit
M-16	5123.519	5123.565	EL (ft)
M-17	5122.956	5123.022	EL (ft)
M-18	5123.229	5123.296	EL (ft)
M-19	5123.368	5123.440	EL (ft)
PI	5123.423	5123.480	EL (ft)
Totalizers (10/1/17 to 9/30/18)			
West Abutment Totalizer	3.79	6.28	gpm
West Abutment Weir	1.00	2.00	gpm
P-226	8.00	11.41	gpm
Tanner Wash Totalizer	1.91	5.57	gpm
Petroglyph	6.21	9.18	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 data for the totalizers and seeps during the current review period indicates that the seepage flow rates have not significantly increased compared to the October 1, 2016 – September 30, 2017 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)	Water Elevation (ft)	Measurement Location
Minimum	8.3	5108.3 (NGVD29)	Upstream slope at the staff gauge
Maximum	11.6	5111.6 (NGVD29)	Upstream slope at the staff gauge
Present (this inspection)	11.0	5111.0 (NGVD29)	Upstream slope at the staff gauge
CCR	Depth of CCR (ft)	CCR Elevation (ft)	Measurement Location
Minimum	~30	~5130 (NGVD29)	Visual observation in the north end of the impoundment
Maximum	45	~5100 (NGVD29)	Upstream slope at the staff gauge
Present (this inspection)	~45	~5115 (NGVD29)	Visual observation in the East Cell

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).

APS excavates bottom ash from the Bottom Ash Pond at various times throughout the year and places it in the Bottom Ash Monofill. Therefore, the maximum depth of CCR varies across the

Bottom Ash Pond throughout the year. The CCR depth in the table is based on visual observations of CCR at approximate EL 5115 feet in the reservoir downstream of the East Decant Cell berm.

5.2.4 Storage Capacity

The estimated remaining storage capacity of the CCR unit at the time of the inspection was 550 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 1,750 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 2017 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 2017. 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 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)	Water Elevation (ft)	Measurement Location
Minimum	N/A	N/A	APS does not regularly record the water elevation.
Maximum	N/A	N/A	
Present (this inspection)	5.3	5012.3 (south cell)	Southwest Edge
	7.0	5014.0 (north cell)	Center of North Embankment
CCR	Depth of CCR (ft)	CCR Elevation (ft)	Measurement Location
Minimum	N/A	N/A	N/A
Maximum	N/A	N/A	N/A
Present (this inspection)	< 5.3	Below EL 5012.3 (south cell)	Southwest Edge
	~7.5	~5014.5 (north cell)	Southwest Edge

Present water and CCR depths are based on original topography presented on APS Drawing #G-44573.

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 4.96 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 5.74 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 2017 inspection.

5.4 BOTTOM ASH MONOFILL

5.4.1 Geometry Changes Since Last Inspection

APS continues to excavate bottom ash from the Bottom Ash Pond and place it in the Bottom Ash Monofill. APS's construction contractor was placing ash in the east expansion area at the time of the inspection.

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, the CCR unit contained approximately 1,014.6 ac-ft in November 2018. 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.

The erosion observed on the eastern side of the top of the Bottom Ash Monofill extended through the soil cover and into the underlying bottom ash. The erosion is localized and does not appear to affect the stability of the CCR unit at this time; however, if the erosion becomes more widespread, it could have the potential to disrupt the operation of the CCR unit. 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 2017 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) Continue identifying and remediating scattered animal burrows and ant hills.	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 Northwest Abutment and the access road near the Geronimo sumps for erosion.	Repair the erosion at the Northwest Abutment and continue to repair other areas 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.
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 as needed.
6) Continue to monitor seepage through the embankment.	NOTE: This will always be an ongoing maintenance activity.

6.2 BOTTOM ASH DAM

Action Item	Action Status
1) Several erosion holes were observed along the crest. Record when/if new erosion holes are observed and when/if additional erosion worsens.	Repair the erosion holes and monitor the area around M-16 for cracking and new holes.
2) Monitor the erosion gullies on the downstream slope of the East Embankment.	Repair as needed.
3) Monitor soil wasting along the downstream slope of the East Embankment near the access road.	Investigate the source of the soil wasting.
4) Shallow erosion was identified in two places along the upstream slope.	Repair the erosion and monitor the areas.
5) Identify and remediate scattered animal burrows and ant hills.	1) Mark animal burrows and ant hills during weekly inspections. 2) Establish regular schedule (e.g. semi-annually) to remediate identified burrows. NOTE: This will always be an ongoing maintenance activity.
6) 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.
7) Continue monitoring the riprap for additional signs of deterioration.	Replace riprap as needed.
8) Continue to monitor seepage through the embankment.	NOTE: This will always be an ongoing maintenance activity.
9) Remove vegetation and debris from the V-notch weir at the West Abutment.	Location is currently obscured and access is 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.

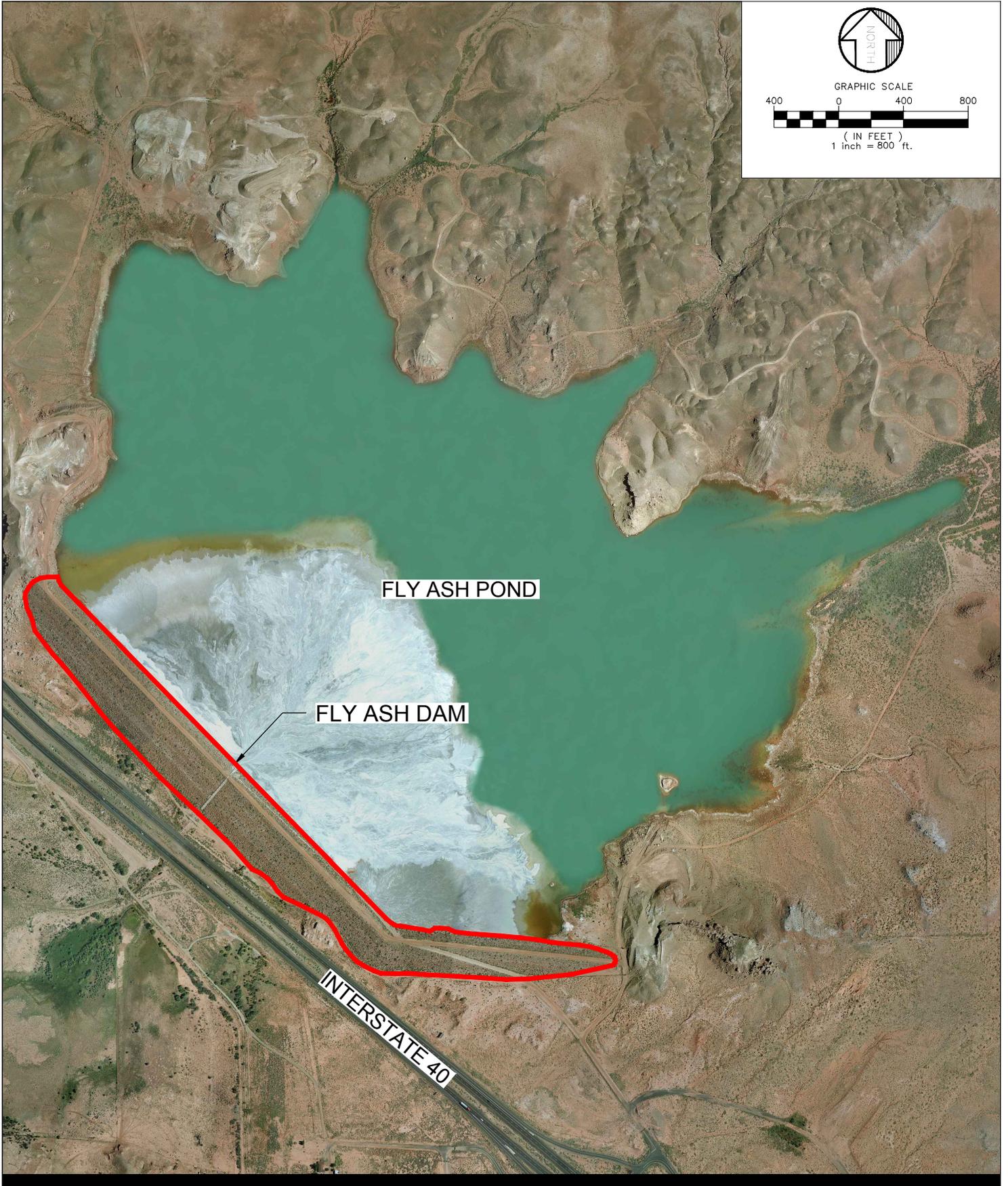
6.4 BOTTOM ASH MONOFILL

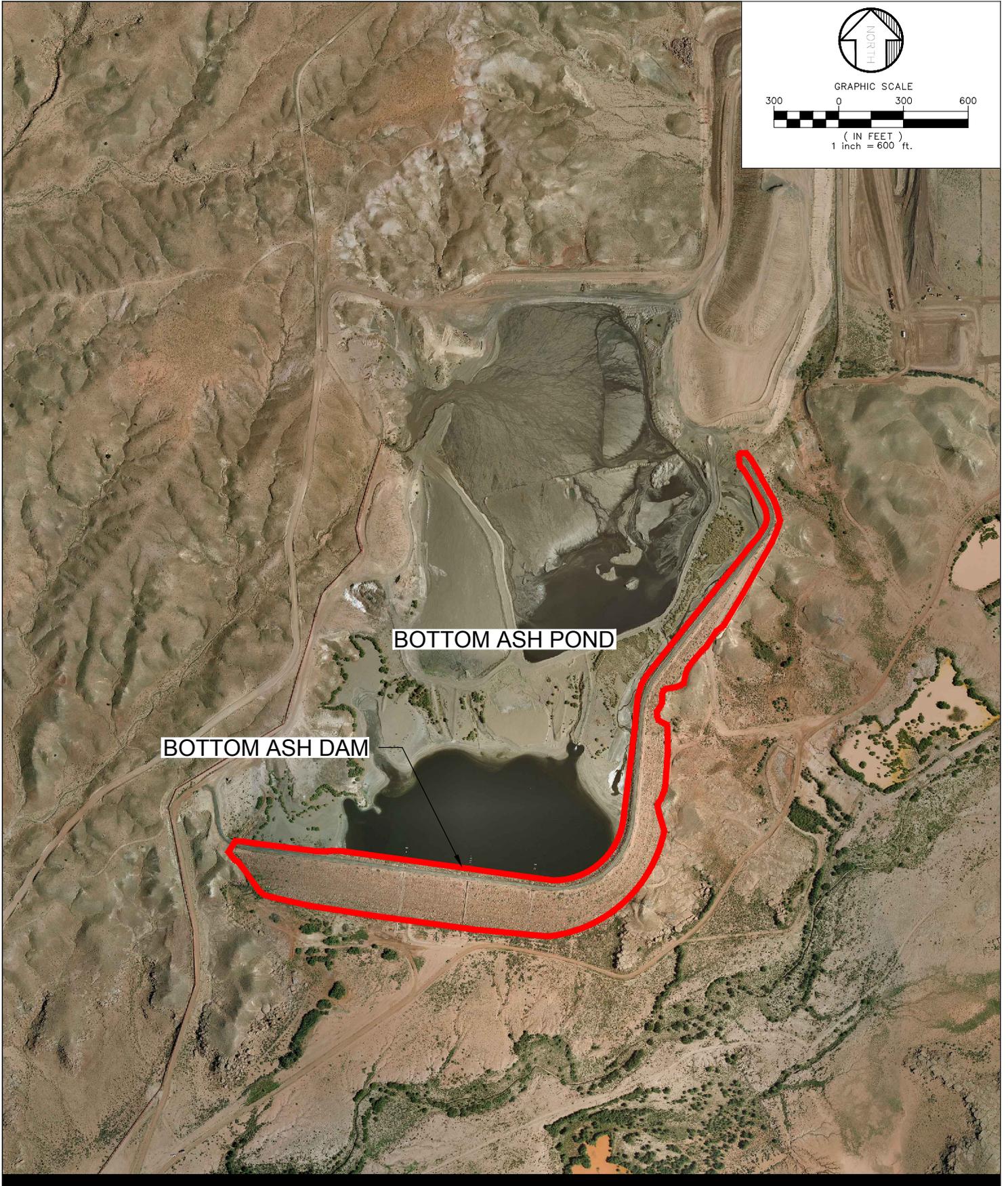
Action Item	Action Status
1) There is significant head cutting at the inlet and northwest corner of the Stormwater Detention Basin.	Repair the erosion and monitor the slopes. Consider installing riprap, grouted riprap, or other erosion protection on the basin slopes to prevent erosion.
2) There is a 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.	Repair the erosion and monitor the area.
3) Minor erosion rills throughout the CCR unit.	Monitor and repair erosion as needed. NOTE: This will always be an ongoing maintenance activity.

7.0 REFERENCES

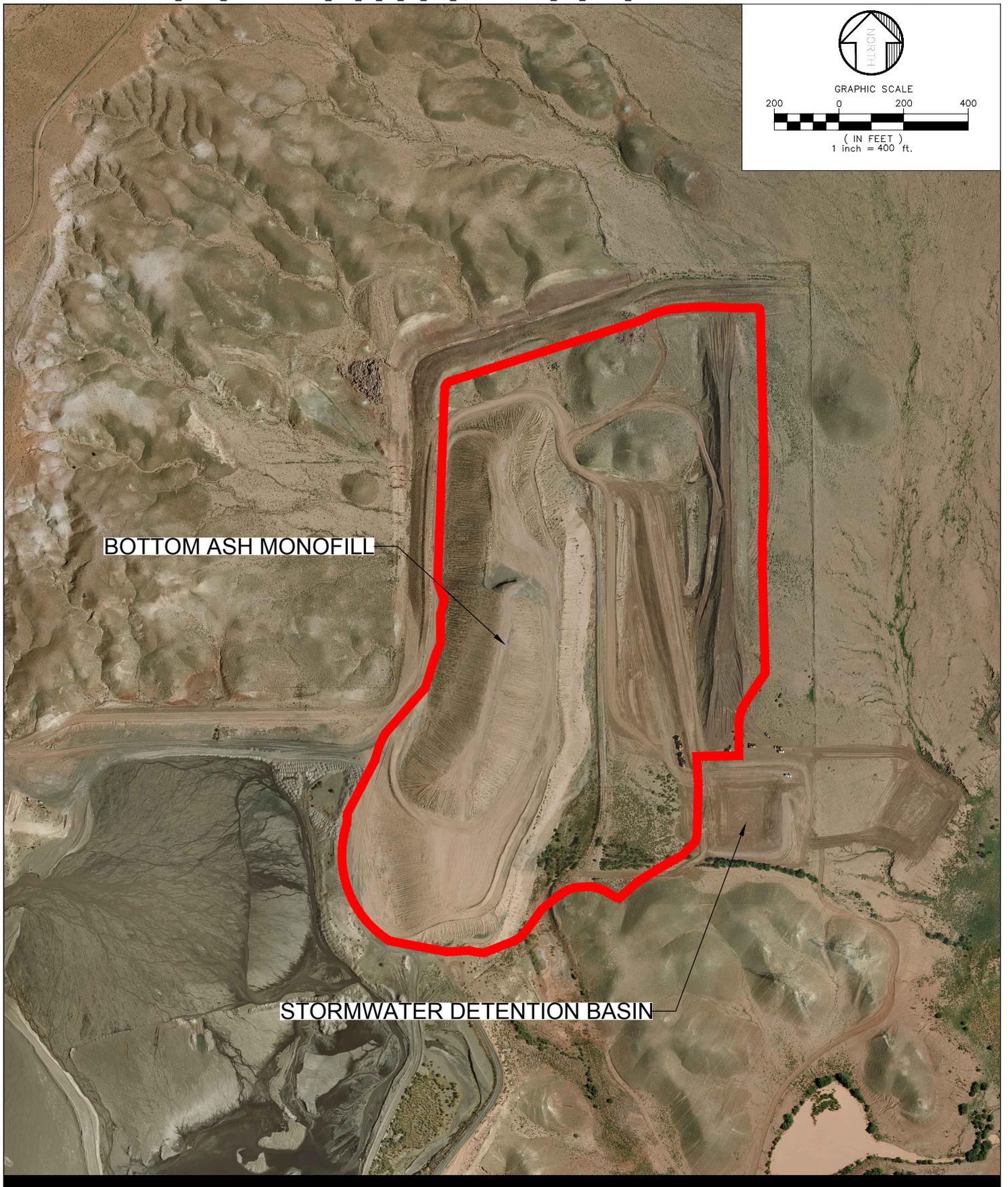
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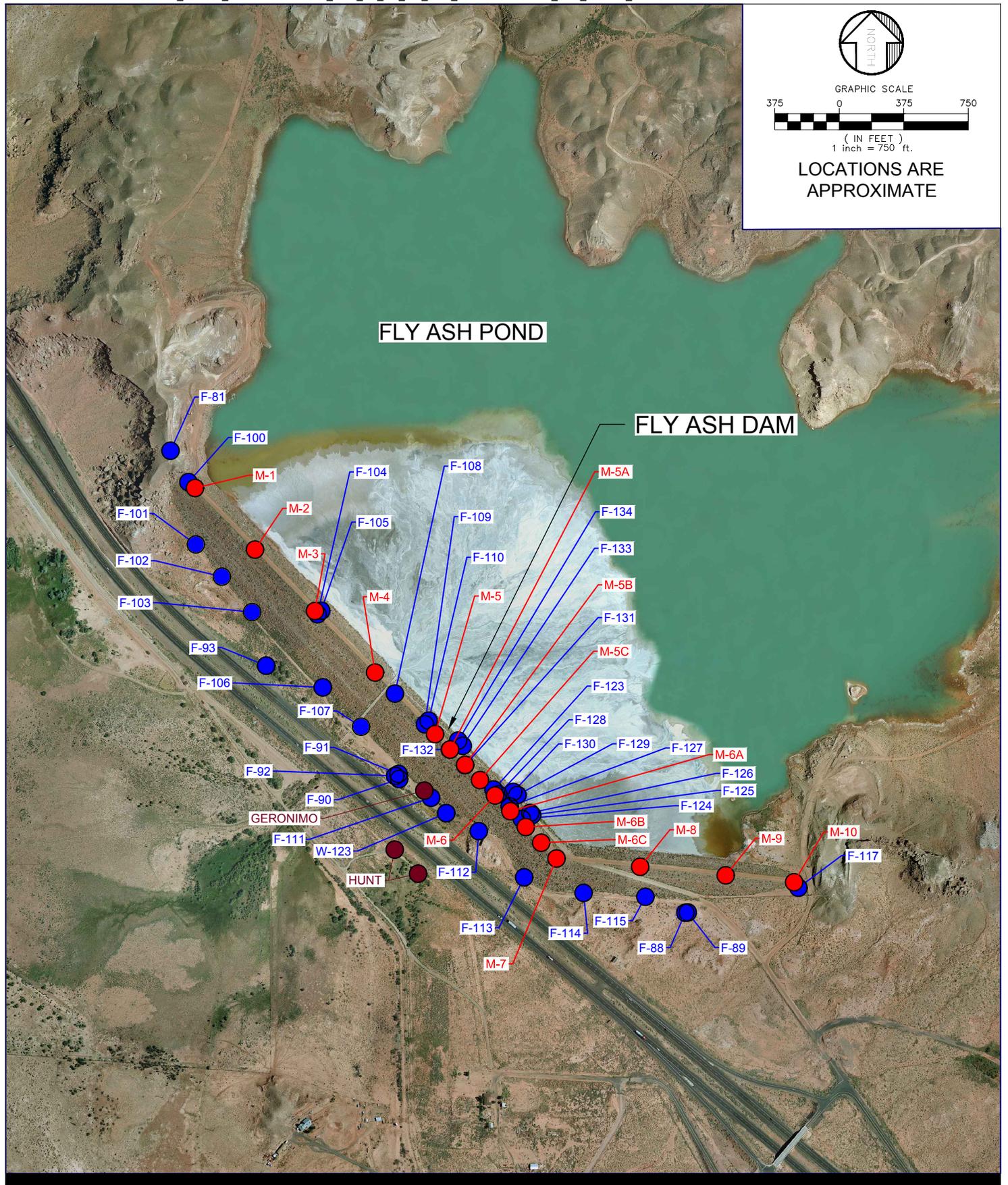
FIGURES

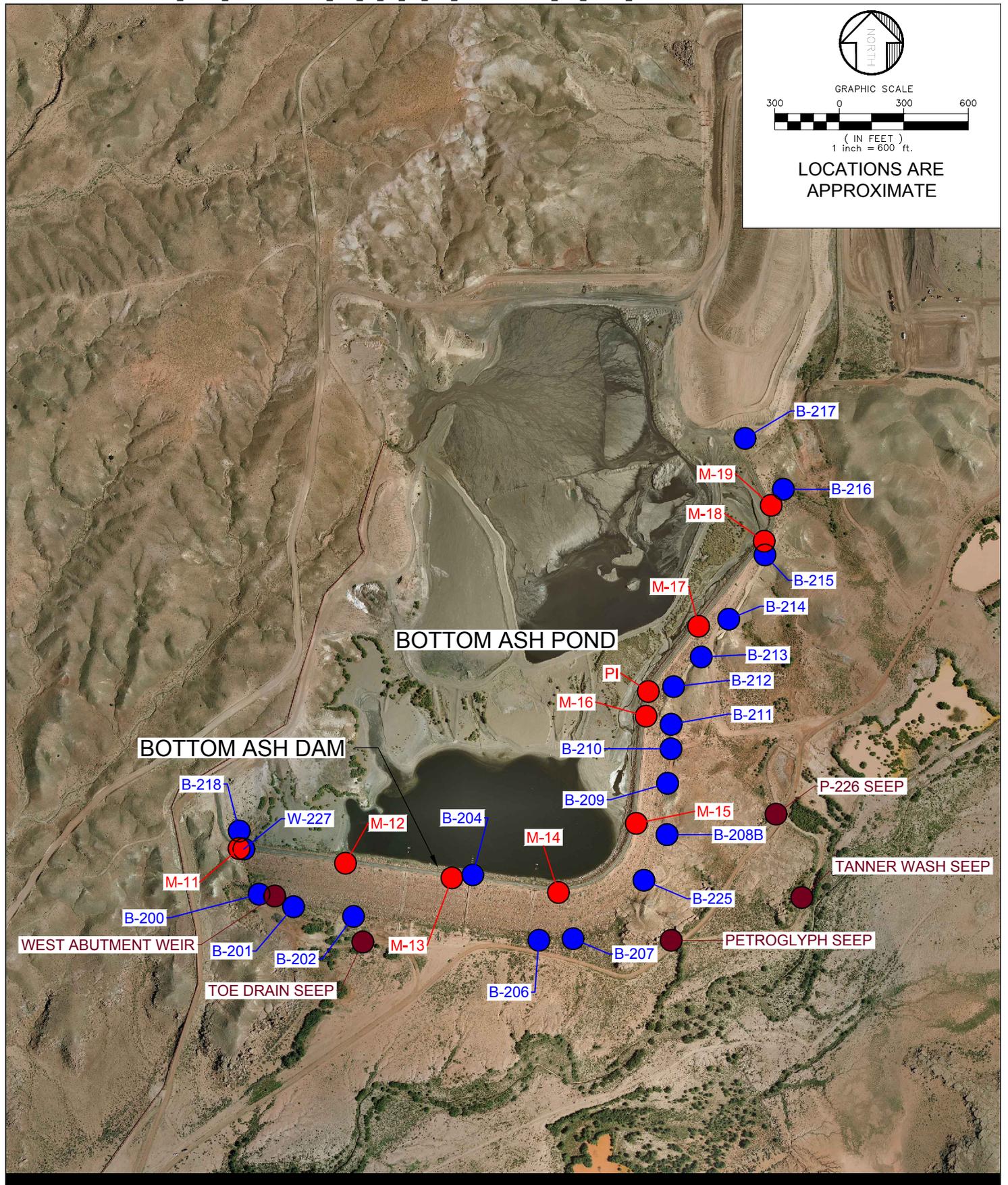












APPENDIX A
FLY ASH DAM PHOTO LOG



20181022 – IMG_0439

Lathe marking the location where the Fly Ash Pond elevation is measured.



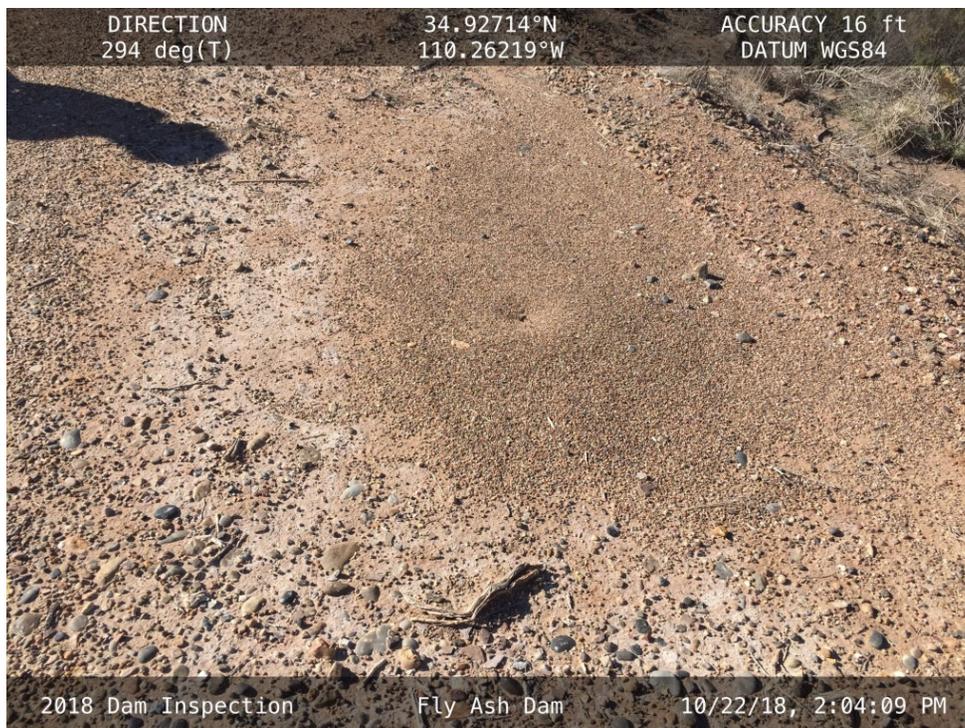
20181022 – IMG_0443

The upstream slope of the South Embankment, facing west from the East Abutment.



20181022 – IMG_0448

The downstream slope of the South Embankment, facing west from the East Abutment.



20181022 – IMG_0453

Ant hill in the crest of the South Embankment along the upstream slope.



20181022 – IMG_0454
 The crest of the South Embankment, facing west.



20181022 – IMG_0455
 The upstream slope of the West Embankment, facing northwest.



20181022 – IMG_0458
 The crest of the West Embankment, facing northwest.



20181022 – IMG_0463
 Minor erosion along the upstream slope of the West Embankment.



20181022 – IMG_0480
 The inlet pipe depositing CCR into the impoundment.



20181022 – IMG_0493
 Area of historic seepage, currently in a dry condition.



20181022 – IMG_0499
Minor soil wasting along the upstream slope.



20181022 – IMG_0502
Minor erosion at the Northwest Abutment contact.



20181022 – IMG_0507
 The upstream slope of the West Embankment, facing southeast.



20181022 – IMG_0509
 The crest and downstream slope of the West Embankment, facing southeast.



20181022 – IMG_0510
The crest of the West Embankment, facing southeast.



20181022 – IMG_0512
A piezometer and a settlement monument along the crest.



20181022 – IMG_0518

The downstream toe of the West Embankment where erosion has historically been observed.



20181022 – IMG_0521

A portion of the Geronimo Sump.



20181022 – IMG_0542
 The Northwest Abutment, facing north from the downstream toe.



20181022 – IMG_0546
 The downstream slope in the north end of the West Embankment, facing southeast.



20181022 – IMG_0553
The I-40 seep in a dry condition.

APPENDIX B
BOTTOM ASH DAM PHOTO LOG



20181022 – IMG_0264

Settlement monument M-11 on the downstream side of the crest near the West Abutment.



20181022 – IMG_0267

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



20181022 – IMG_0270
 The South Embankment crest, facing east from the West Abutment.



20181022 – IMG_0275
 The South Embankment crest and vegetation near the West Abutment, facing west.



20181022 – IMG_0280

Incipient erosion rill on the upstream side of the South Embankment crest.



20181022 – IMG_0281

Shallow erosion hole on the South Embankment crest.



20181022 – IMG_0282

The western siphon line in the Bottom Ash Pond, facing upstream (north).



20181022 – IMG_0283

Shallow erosion on the upstream slope and crest near the western siphon line.



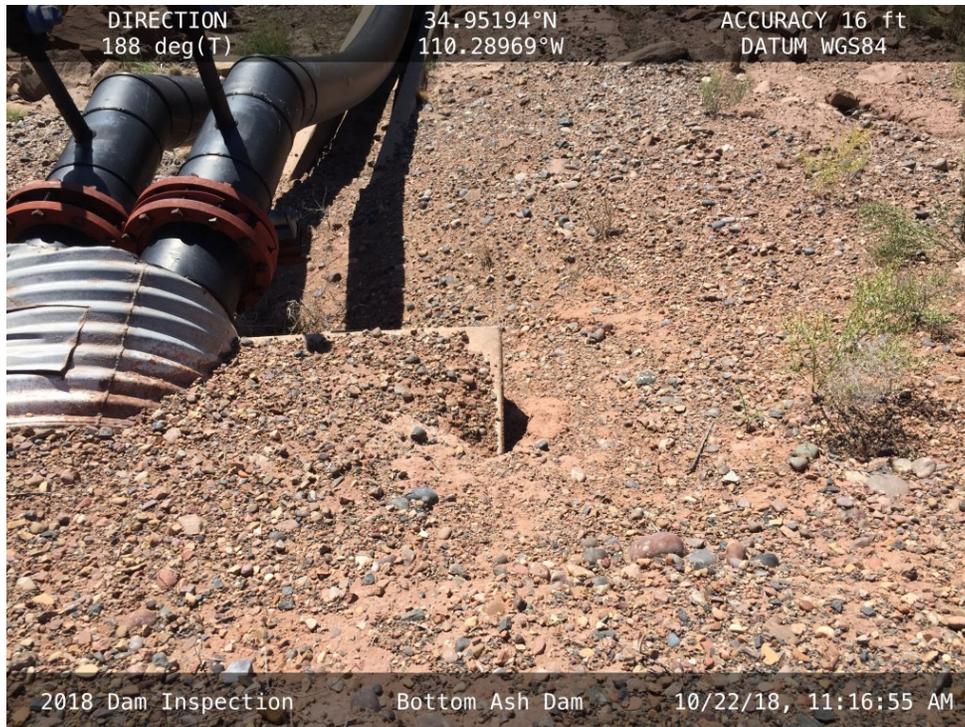
20181022 – IMG_0290

The western siphon line at the Bottom Ash Dam, facing downstream (south).



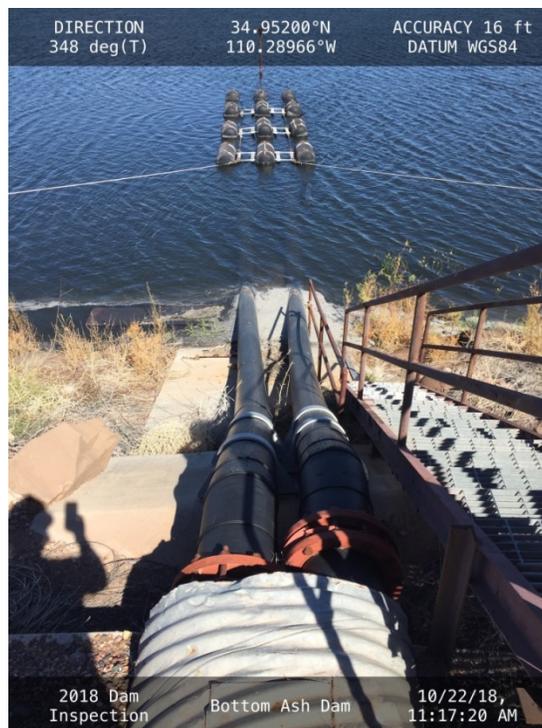
20181022 – IMG_0294

Erosion hole on the downstream side of the South Embankment crest.



20181022 – IMG_0296

Minor erosion around the concrete encasement for the central siphon lines, facing downstream.



20181022 – IMG_0298

The central siphon lines, facing upstream (north).



20181022 – IMG_0302
 The water level staff gage adjacent to the central siphon lines.



20181022 – IMG_0304
 Minor erosion hole on the downstream side of the South Embankment crest.



20181022 – IMG_0314

The crest and upstream slope of the South Embankment, facing west.



20181022 – IMG_0318

Vegetation on the downstream slope along the southeast corner of the Bottom Ash Dam.



20181022 – IMG_0323

The upstream slope of the East Embankment, facing north from the South Embankment.



20181022 – IMG_0325

An erosion hole in the crest at the southeast corner of the Bottom Ash Dam.



20181022 – IMG_0332
 The southern half of the East Embankment crest, facing north.



20181022 – IMG_0341
 A series of erosion holes on the upstream shoulder of the crest near settlement monument M-16.



20181022 – IMG_0343
 Additional erosion hole near settlement monument M-16.



20181022 – IMG_0345
 The downstream slope of the northern half of the East Embankment, facing northeast.



20181022 – IMG_0353
Vegetation on the upstream side of the East Embankment.



20181022 – IMG_0362
An ant hill along the crest in the northern half of the East Embankment.



20181022 – IMG_0364

The East Embankment crest and downstream slope, facing south from the North Abutment.



20181022 – IMG_0369

Ash removal activities in the west basin of the Bottom Ash Pond.



20181022 – IMG_0373

Soil erosion on the downstream slope of the East Embankment near the North Abutment.



20181022 – IMG_0376

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



20181022 – IMG_0381

A second erosion gully on the downstream slope of the East Embankment.



20181022 – IMG_0727

The stump of a tree left over after vegetation removal activities (to be removed).



20181022 – IMG_0395
The downstream toe of the South Embankment, facing west.



20181022 – IMG_0409
The downstream slope of the South Embankment, facing east from the West Abutment.



20181022 – IMG_0417
 The West Abutment groin, facing downstream from the crest.



20181022 – IMG_0423
 New fencing installed around the Petroglyph Seep.



20181022 – IMG_0424

The P-232 seepage intercept area, facing north from the south end.

APPENDIX C
SEDIMENTATION POND PHOTO LOG



20181023 – IMG_0631

The divider wall in the Sedimentation Pond, facing northeast.



20181023 – IMG_0632

The upstream slope on the south side of the southern cell, facing northeast.



20181023 – IMG_0634
The northern cell of the Sedimentation Pond, facing northeast.



20181023 – IMG_0636
The upstream slope on the east side of the southern cell, facing north.



20181023 – IMG_0638

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



20181023 – IMG_0641

The upstream slope on the north side of the northern cell, facing west.



20181023 – IMG_0644

The divider wall and southern cell, facing southwest from the east embankment.



20181023 – IMG_0645

The upstream slope on the east side of the northern cell, facing east.



20181023 – IMG_0650
Sediment accumulated in the west side of the northern cell.



20181023 – IMG_0653
An inlet pipe on the west side of the northern cell.



20181023 – IMG_0656

The concrete spillway on the downstream side of the south embankment.



20181023 – IMG_0659

Erosion under the concrete spillway on the downstream side of the south embankment.

APPENDIX D

BOTTOM ASH MONOFILL PHOTO LOG



20181022 – IMG_0561

Bottom ash being placed in the Bottom Ash Monofill, facing north from the top of the Monofill.



20181022 – IMG_0562

The Stormwater Detention Basin, facing southeast from the top of the Monofill.



20181022 – IMG_0564
Cover soil on the surface of the Bottom Ash Monofill.



20181022 – IMG_0565
An erosion gully on the east side of the Bottom Ash Monofill requiring repair.



20181022 – IMG_0575
 Minor erosion rills on the south side of the Bottom Ash Monofill.



20181022 – IMG_0592
 Bottom ash being placed in the Monofill.



20181022 – IMG_0593

The Stormwater Diversion Channel along the north side of the Bottom Ash Monofill.



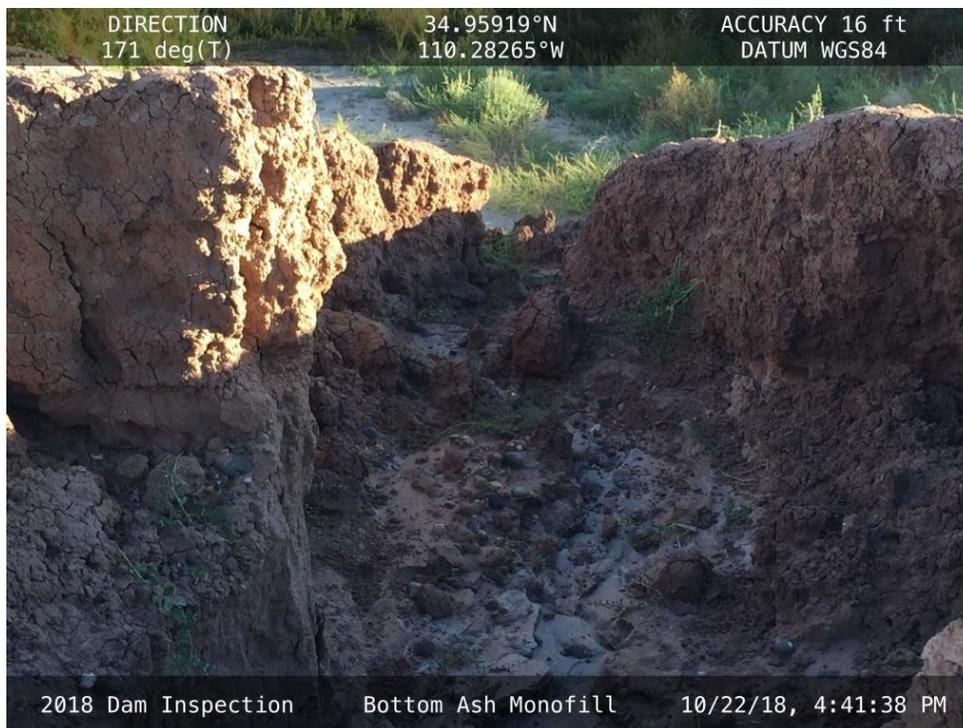
20181022 – IMG_0595

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



20181022 – IMG_0596

The western slope of the Bottom Ash Monofill, facing southeast.



20181022 – IMG_0607

Significant erosion in the northwest corner of the Stormwater Detention Basin, facing south.



20181022 – IMG_0620

Headcutting on the east side of the Stormwater Detention Basin, facing east.



20181022 – IMG_0626

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

DIRECTION
225 deg(T)

34.95945°N
110.28316°W

ACCURACY 33 ft
DATUM WGS84



20181022 – IMG_0628

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