

Amchitka Annual Site Inspection Trip Report Amchitka, Alaska, Site

August 2017

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| Charlie Runway | Cannikin South |
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| Rifle Range | MM4 Stream Crossing |
| Long Shot | MM18 Road Damage |
| Site D | MM5 Road Damage |
| Site F | MM8 Borrow Pit Area |
| Cannikin Ground Zero | |

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1.0 Introduction

1.1 Purpose

The June 2014, 7.9 Magnitude earthquake off the northwest coast of Amchitka Island slightly damaged two mud pit caps, moderately damaged a third mud pit cap and caused foundation soils beneath two other mud pit caps to become unstable. Due to the June 2014 earthquake damage the U.S. Department of Energy Office of Legacy Management (LM) is performing annual inspections of the mud pit caps beginning in 2017 until a corrective action is implemented. This trip report summarizes the site visit to Amchitka Island in 2017 with personnel from LM and the Legacy Management Support contractor, Navarro Research and Engineering, Inc. (Navarro), from June 15 through June 22, 2017.

The scope of the 2017 annual inspection is similar to that performed in 2006, 2011, 2014, 2015, and 2016 with an emphasis on the earthquake damage. Visual observations of the mud pit caps were compared to the visual observations performed in 2016 to determine whether or not additional damage has occurred since the last inspection. Vegetation inspections of the caps were not part of this annual site inspection. To support the future corrective action, additional observations were made and recorded regarding site conditions and access that would affect any future corrective action.

1.1.1 Site

Amchitka, Alaska, Site

1.1.2 Project

Annual Mud Pit Cap Site Inspection

1.1.3 Inspection Team

- Stephen Pitton (Site Lead)
- Dan Brennecke (Engineering)
- Dan Nordeen (Engineering)
- Jason Nguyen (LM Site Manager)

2.0 Basic Itinerary

- Sunday, June 11, 2017, through Wednesday, June 14, 2017
 - Inspection team arrived on Adak Island.
 - Inspection team reviewed existing documents and continued planning and logistics for the mud pit cap inspections.

- Thursday, June 15, 2017
 - U.S. Fish and Wildlife Service (USFWS) vessel Tiglax arrived and the inspection team boarded with gear.
 - Ship left for Amchitka Island.
- Friday, June 16, 2017
 - Inspection team arrived at Amchitka Island at approximately 8:30 a.m.
 - Unloaded equipment onto pier and set up for inspections.
 - Reviewed scope for the day, reviewed coordination and logistics with ship crew, reviewed and signed Job Safety Analysis.
 - Began inspections at Charlie runway and Baker runway.
 - Inspected the Rifle Range site.
- Saturday, June 17, 2017
 - Inspection team reviewed scope for the day, reviewed coordination and logistics with ship crew, performed the daily safety inspection of equipment, and held the daily safety discussion.
 - Inspected Site E.
 - Inspected Site F.
 - Inspected Cannikin Ground Zero.
 - Inspected Cannikin South.
- Sunday, June 18, 2017
 - Inspection team reviewed scope for the day, reviewed coordination and logistics with ship crew, performed the daily safety inspection of equipment, and held the daily safety discussion.
 - Inspected Site D.
 - Inspected mile marker (MM) 8 borrow area.
 - Inspected MM 8 stream crossing.
 - Inspected MM 4 stream crossing.
 - Inspected MM 18 road damage.
- Monday, June 19, 2017
 - Inspection team reviewed scope for the day, reviewed coordination and logistics with ship crew, performed the daily safety inspection of equipment, and held the daily safety discussion.
 - Inspected the Long Shot site.
 - Traveled to approximately MM 36 to look for and inspect a well that was part of the Plowshare program (did not find any evidence of the well).
 - Completed inspections and began trip back to Adak on Tiglax.

- Tuesday, June 20, 2017
 - Tiglax anchored at Gareloi Island to inspect a U.S. Geological Survey (USGS) seismic station.
 - Tiglax sailed to and anchored at Kavalga Island to inspect a USGS seismic station.
 - Tiglax sailed for Adak.
- Wednesday, June 21, 2017
 - Inspection team arrived at Adak Island.
 - Unloaded equipment and gear. Cleaned equipment and placed it in storage on Adak.
- Thursday, June 22, 2017
 - Inspection team traveled home.

3.0 Observations

In general, each of the seven mud pits were visually inspected by walking the perimeter of the cap toe and then walking across the top of each mud pit in a direction perpendicular to the longest pit dimension at approximately 50-foot (ft) intervals. The mud pit caps and the surrounding areas were inspected for evidence of subsidence, cracking, animal burrowing, and other types of erosion. All of the cracks and damaged areas that were identified were inspected, physical coordinates verified, and photographed to document any changes from the 2016 inspection (see Appendix A: Mud Pit Figures, Appendix B: Mud Pit Inspection Checklists and Photos). The extent of current cracks and damage was noted and compared to GPS coordinates collected on previously noted cracks. New GPS coordinates were collected to document any change in conditions. Two existing runways were inspected to determine potential air support capability for future construction activities.

3.1 Charlie Runway

In general, the center of the runway appears to be usable and suited for use of small to medium-sized aircraft. The majority of damage observed was on the edges of the runway. The asphalt in failure areas was measured to be approximately 6 inches thick. Numerous cracks, depressions, and sink holes were found. Cracks ranged from a couple inches (approximately 2 inches) up to 32 inches wide and ranged from approximately 1 inch up to 10 inches deep. Depression and ponded areas ranged from 1 inch up to approximately 4 inches deep, with a size ranging from approximately 50 ft up to 90 ft in diameter. Several sink holes were observed in the asphalt and ranged from 6 ft to 17 ft in diameter and 3 ft to 7 ft deep. Several corrugated metal pipes were observed running under the runway and all appeared to be heavily deteriorated and contributing to depressions in the runway surface. Water was flowing through some while others appeared to be dry. Several wood pipes (4 inches in diameter) were observed running under the runway and all were heavily deteriorated with no running water observed. See Appendix B for photos.

3.2 Baker Runway

As a whole, the Baker runway was in excellent condition with no repairs necessary and only minimal repairs recommended- no major cracks or sink holes were observed. One depression area with ponded water was observed on the edge of the runway measuring approximately 180 ft by 30 ft by 2 inches deep. The primary concern observed that could impact aircraft landing is accumulated vegetation, primarily moss. If the vegetation is cleared, then the runway surface appears to be in a fully functioning condition. The distance from the edge of the runway to the longitudinal light pads was measured to approximately 50 ft on the south side and 55 ft on the north side, and the effective runway width was approximately 173 ft (in between light pads). See Appendix B for photos.

3.3 Rifle Range

In general, no new earthquake damage was seen on the Rifle Range site and it appeared to be in better condition than observed in previous inspections. The previously observed crack on the north side of the pit (see photographs) was still visible. Transverse cracks were estimated at approximately 20 ft long and were similar to those observed in 2016 (Figure A-1 of the Amchitka Mud Pit Sites 2016 Post-Closure Monitoring and Inspection Report Amchitka Island, Alaska dated November 2016). This crack appeared to be continually self-healing and was in better condition than when observed during the 2014, 2015, and 2016 inspections. No exposed liner was visible. Surface water was collecting and ponded at the edge of the cap in the designed toe drain (north side). The existing pond at the southeast side of the cap (approximately 5 ft off the edge of the cap toe) contained water but did not show signs of impacting the cap. The hillside off the east edge of the cap showed signs of erosion but did not appear to be impacting the cap. The new cracks and features collected as shown in Appendix A, Figure 1 did not appear to be new damage but are areas that may not have been observed due to being covered by vegetation.

A visual inspection of the Rifle Range borrow area determined that additional material could be removed for future construction activities. A geotechnical analysis of the soil is recommended to determine the characteristics and suitability. Drill rig access is acceptable. See Appendix B for photos and the inspection checklist.

3.4 Long Shot

Overall the Long Shot site seemed to be in the same to slightly better condition as observed in 2016. The previously observed crack/scarps, depression area, and burrowing holes noted in Figure A-2 of the Amchitka Mud Pit Sites 2016 Post-Closure Monitoring and Inspection Report Amchitka Island, Alaska dated November 2016 were inspected. Most of the crack/scarps remained visible but did not show a change in condition. The small cracks along the north side appeared to be self-healing and were almost invisible through the vegetation. Longitudinal and transverse cracking ranged from approximately 1 inch to approximately 6 inches wide and 4 inches to 10 inches deep.

No new scarps or cracks were observed; existing scarps are healing (no continued or fresh damage). The geomembrane liner was not visible. One new observation is that the small animal burrowing holes increased in number on both the east and north sides. In the 2016 site inspection, approximately three animal holes were observed on the east side near the toe and no

other holes were found on the cap. These holes were filled in and compacted by stomping on them by foot in 2016. Now three to five holes are visible on the east side in the same area and approximately nine new holes are visible on the north face. The south face has visible undulation across the entire side. It is unknown if this is left over from the original construction or if settlement is occurring. The new features collected are areas that may not have been observed in previous inspection due to being covered by vegetation (see Appendix A, Figure 2). See Appendix B for photos and the inspection checklist.

3.5 Site D

Additional items that were added to the base inspection at Site D:

- Existing borrow area
- Proposed new location for materials from Sites E and F, size, surrounding area, material
- Slide area on south side
- Drill rig access (to top of cap, slide area, proposed area for materials from Sites E and F)
- Integrity of exposed liner
- Surface moisture content of slide area
- Localized borrow material
- Dig/investigate exposed liner
- Look at actual slopes on south side with GPS and inclinometer
- Look for control points shown on original construction drawings

In general, the Site D mud pit cap did not show any new damage and appeared to be in slightly better condition along the north side and in the same condition as described in the 2016 inspection report along the south side (Figure A-5 of the Amchitka Mud Pit Sites 2016 Post-Closure Monitoring and Inspection Report Amchitka Island, Alaska dated November 2016). All previously noted damage areas were inspected. Damage along the north side is no longer visible. The mud pit marker sign located at the north end of the east cap and four signs along the east side of the east cap have been damaged and are no longer attached to the metal T-posts. It is recommended that they be replaced. The loose signs were placed at the base of the posts. The drainage channel between the east and west cap had ponded water in it, located at both the north and south ends. The small depression/seep where exposed water has an oily or biogenic sheen is near the top of the southwest side slope of the west mud pit cap. This feature, which is not related to a linear crack, as noted in past inspections, is probably not a result of the earthquake and the slump may increase in size if the seepage persists. It currently has not changed from past inspections. Cracks labeled “D1” and “D5” from the 2016 inspection were no longer visible and appeared to be self-healed. Crack “D6” from the 2016 inspection is still visible with 0 to 8 inches of displacement, no gaps, and showing signs of self-healing. The terracing slump area (labeled D3 in the 2016 inspection) did not show visible signs of any changes. An investigation hole was dug approximately 2 ft to 2.5 ft below the existing grade. The liner was not encountered. The cap material was extremely saturated and water below the surface was flowing readily into the hole. Photos and a GPS coordinate were taken prior to backfilling the hole. The damage along the entire south side remained in the same condition as previously observed. Slopes along the south side of the east cap were measured to be approximately 1.25:1 (horizontal to vertical) up to 1.6:1

(32–38 degrees). The slope along the south side of the west cap was measured to be approximately 1.5:1 (horizontal to vertical, 34 degrees). The two locations of exposed liner were inspected and appeared to be in acceptable condition. Material was dug out adjacent to the vertical face of the exposed liner to confirm that the exposed liner was within the anchor trench. The vertical dimension from the liner crest to the bottom edge of the liner within the anchor trench is approximately 3.5 feet. The liner did not extend horizontally across the bottom of the anchor trench. The material at the bottom of the liner was wet. It was unclear if the material was saturated from water under the liner or from water above the liner. As noted in the 2016 inspection report, the breach in the sediment trap southwest of the west mud pit cap did not show any new signs of erosion nor did the rocky slope along the southwest edge of the west mud pit cap.

The existing borrow pit at Site D was evaluated and was determined to only be useable for gravel and rock material. The surrounding area near the concrete drill pads appeared to have available borrow material but would require a subsurface investigation and a geotechnical analysis to determine volumes and soil characteristics. Drill rig access is best from the north end and possible to all locations but may be difficult depending on the weather and field conditions at the time of construction. Drill rig and equipment access to the south side may require soil stabilization or the use of load dissipation mats. The proposed area north of the Site D mud pit was evaluated for the future repository of the combined Site E and Site F material. The area appeared to be flat and the size could easily accommodate the new material (see Appendix A, Figure 3). A geotechnical analysis of the area is recommended to determine the suitability prior to any design. The existing survey control points were not found. See Appendix B for photos and the inspection checklist.

3.6 Site F

In general, the Site F mud pit cap did not show any new damage and appeared to be in the same condition as described in the 2016 inspection report. The earthquake damage along the south side that was observed in 2016 (Figure A-6 of the Amchitka Mud Pit Sites 2016 Post-Closure Monitoring and Inspection Report Amchitka Island, Alaska dated November 2016) was still visible. No geomembrane was exposed. The south side damage showed approximately three terraces of scarp; the upper ranged from 6-inch to 12-inch vertical displacement, and the middle and bottom ranged from 6-inch to 18-inch vertical displacement. Slopes were estimated at 1.4:1 (horizontal to vertical) on the south side (approximately 35 degrees). Slopes on the north side are approximately 4:1; slopes on the east and west sides are approximately 3:1 to 4:1. The depression in the southwest side of the cap from previous inspections remains in the same condition. Ponded water continues to accumulate at the east end of the mud pit cap in Channel F1 and in a trench to the south. Minor trenching and filling should be done to allow the water to drain away from the mud pit cap, as designed. Site access for a drill rig is acceptable. The drill rig will have to cross the small drainage channel along the toe at the north side of the cap. After further review of the original construction drawings, it was noted that the actual edge of the cap on the south side is not in the failure area. The distance from where the geomembrane is placed in the anchor trench is estimated to be approximately 10 ft from the shoulder of the slope where the scarp is located. Therefore, the cap integrity is still in an undamaged state. In addition, a further review of the general area outside of the mud pit cap indicated that the lateral scarp on the north side of the mud pit that was noted in the 2016 inspection was still visible but it has not changed in size or length and shows signs of self-healing. New GPS coordinates of the

lateral scarp were collected to support future inspections (see Appendix A, Figure 4). See Appendix B for photos and the inspection checklist.

3.7 Cannikin North and South

No distress or changes were observed at these sites. See Appendix B for photos and the inspection checklist.

3.8 Site E

In general, the Site E mud pit cap did not show any new damage and appeared to be in the same condition as described in the 2016 inspection report. The earthquake damage along the south side (approximately 30 ft from the toe of the cap) and the scarp on the north side that were observed in 2016 are still visible (Figure A-7 of the Amchitka Mud Pit Sites 2016 Post-Closure Monitoring and Inspection Report Amchitka Island, Alaska dated November 2016). No geomembrane was exposed. The south side damage did not show any signs of expanding or migrating toward the mud pit. The cap soils were wet and soft. Two drain channels on the east side (minor drain channel) and west side (major or dominant drain channel) of the pit converge on the south side at the slump area. Several minor scarps and cracks on the south side were found to be covered with vegetation and new GPS coordinates were collected for future inspections (see Appendix A, Figure 5). A 0.5-inch-diameter black electrical cable was found on the southeast side of the cap and appeared to be partially buried in the cover material. Drill rig access is passable but mats may be needed to minimize damage due to soft soils. Access from the gravel road is not clearly defined and is soft in areas but is useable. The reddish brown seeps noted in the previous inspection are still visible and remain in the same condition. See Appendix B for photos and the inspection checklist.

3.9 Mile Marker 4 and 8 Stream Crossings

Stream crossings are in the same condition as observed in the 2016 inspection. Existing conduit is buried at crossings approximately 4 ft below grade and 5 ft from the edge of road. The contents and condition of the material inside the conduits was not investigated. The road width was approximately 24 ft at mile marker (MM) 4 and 30 ft at MM 8. The depth to creek flow line from road centerline was approximate 10 ft at both locations. The distance across the washout at MM 4 and MM 8 was approximately 24 ft and 28 ft respectively. Neither crossings are currently passable by equipment and will require repair. See Appendix B for photos.

3.10 Mile Marker 18 Road Damage

MM 18 road damage was in better condition than that observed in the 2016 inspection. Cracks and scarps appeared to be self-healing. The transverse cracks (north end of damage area) measured approximately 21 ft long and 1 ft to 2.5 ft deep and 2 ft to 4 ft wide. The longitudinal cracks ranged from approximately 40 ft long and 1 ft wide and up to 10 inches deep, to 60 ft long and up to 4 ft wide and 18 inches deep. This area is currently not passable by equipment and will require repair. See Appendix B for photos.

3.11 Mile Marker 5.5 Road Damage

The road at approximately MM 5.5 has several large cracks along one side of the road that range from 6 ft to 10 ft wide and 1 ft to 2.5 ft deep. The road is currently accessible by ATV but will require repairs for access by standard-sized vehicles and equipment. Grading of the existing road material will likely fix the problem. See Appendix B for photos and the inspection checklist.

3.12 Mile Marker 8 Borrow Pit

A visual inspection of the borrow area determined that additional material could be removed by extending the existing excavation area further into the hillside or by scraping the surface in the area southwest of the original borrow area. A subsurface investigation and geotechnical analysis of the soil is recommended to determine the available volumes and soil characteristics. See Appendix A for figure of the borrow pit and Appendix B for photos.

3.13 RX Site

The RX site was visually inspected for future use per the request of the Amchitka Working Group. The RX site is flat and could be used for the new Site E and Site F repository, but would require a 12-14 mile haul of the Site E and Site F mud pit material. Additionally, material could be scraped and potentially used as borrow but would require an 8-10 mile haul if the material was hauled to Site D.

3.14 Action Items

LM will continue annual inspections until corrective actions have been completed.

Appendix A

Mud Pit Figures

Figure 1. Rifle Range

Figure 2. Long Shot

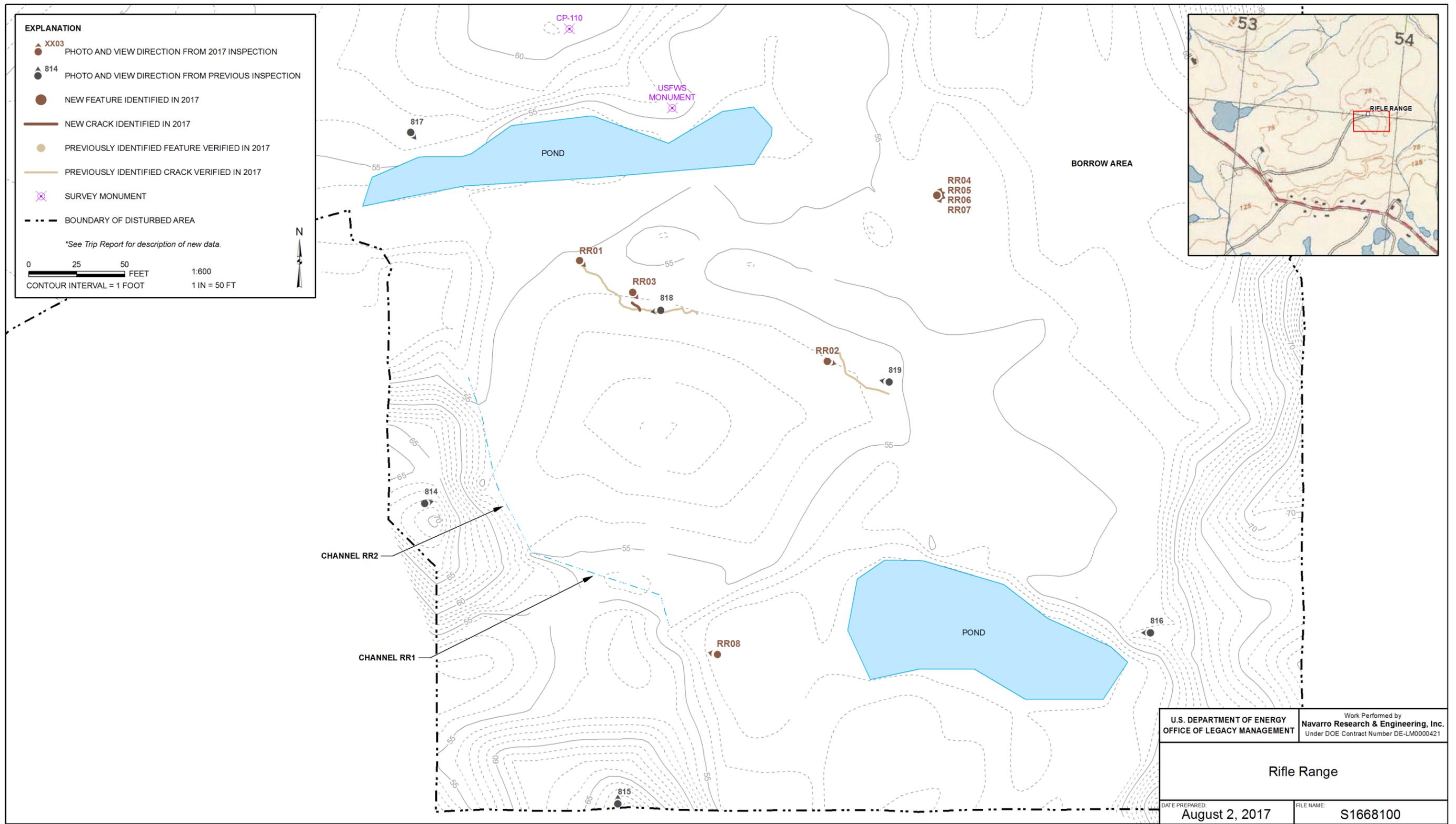
Figure 3. Site D

Figure 4. Site F

Figure 5. Site E

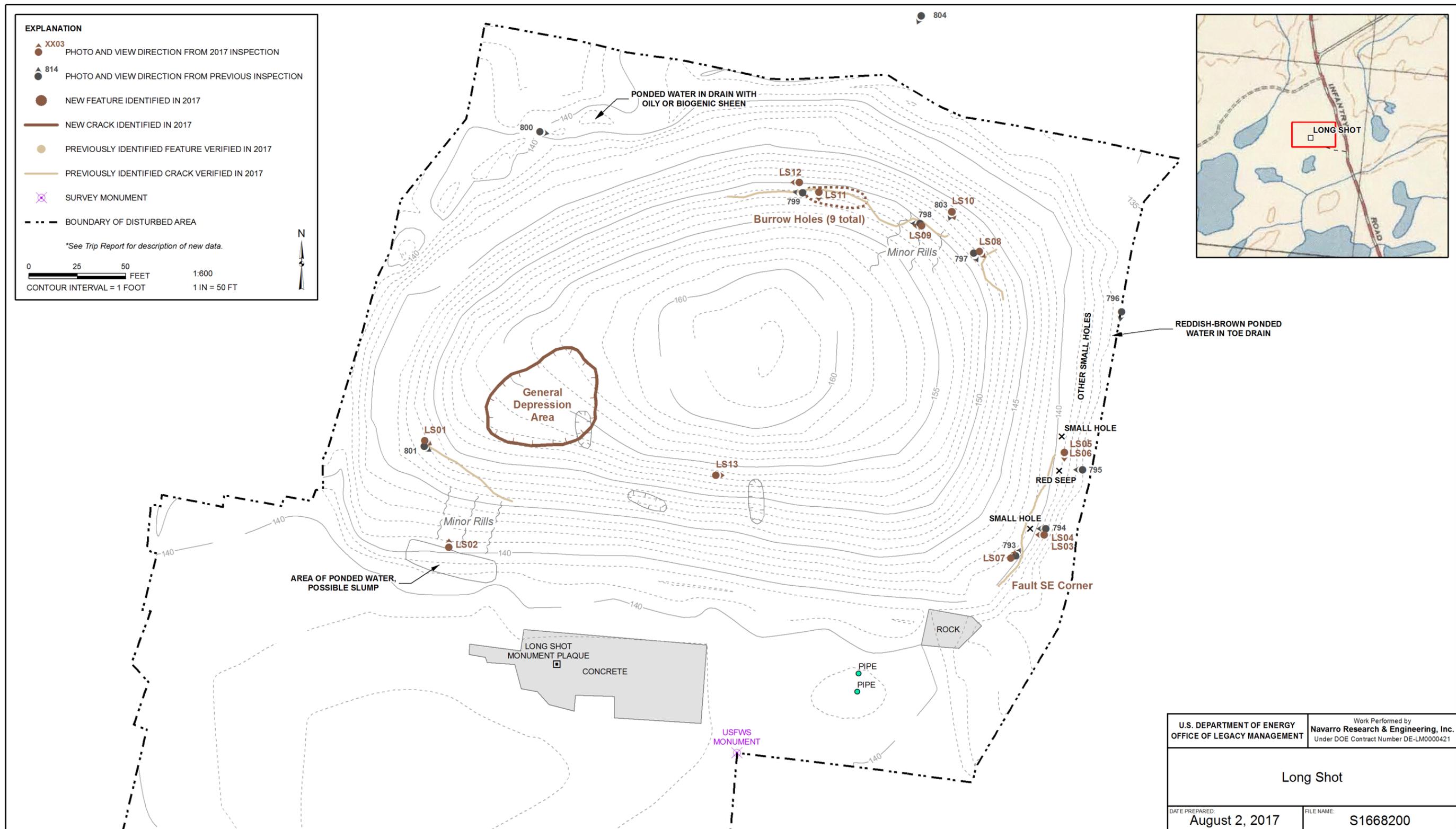
Figure 6. MM8 Borrow Pit

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Figure 1. Rifle Range



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Figure 2 Long Shot

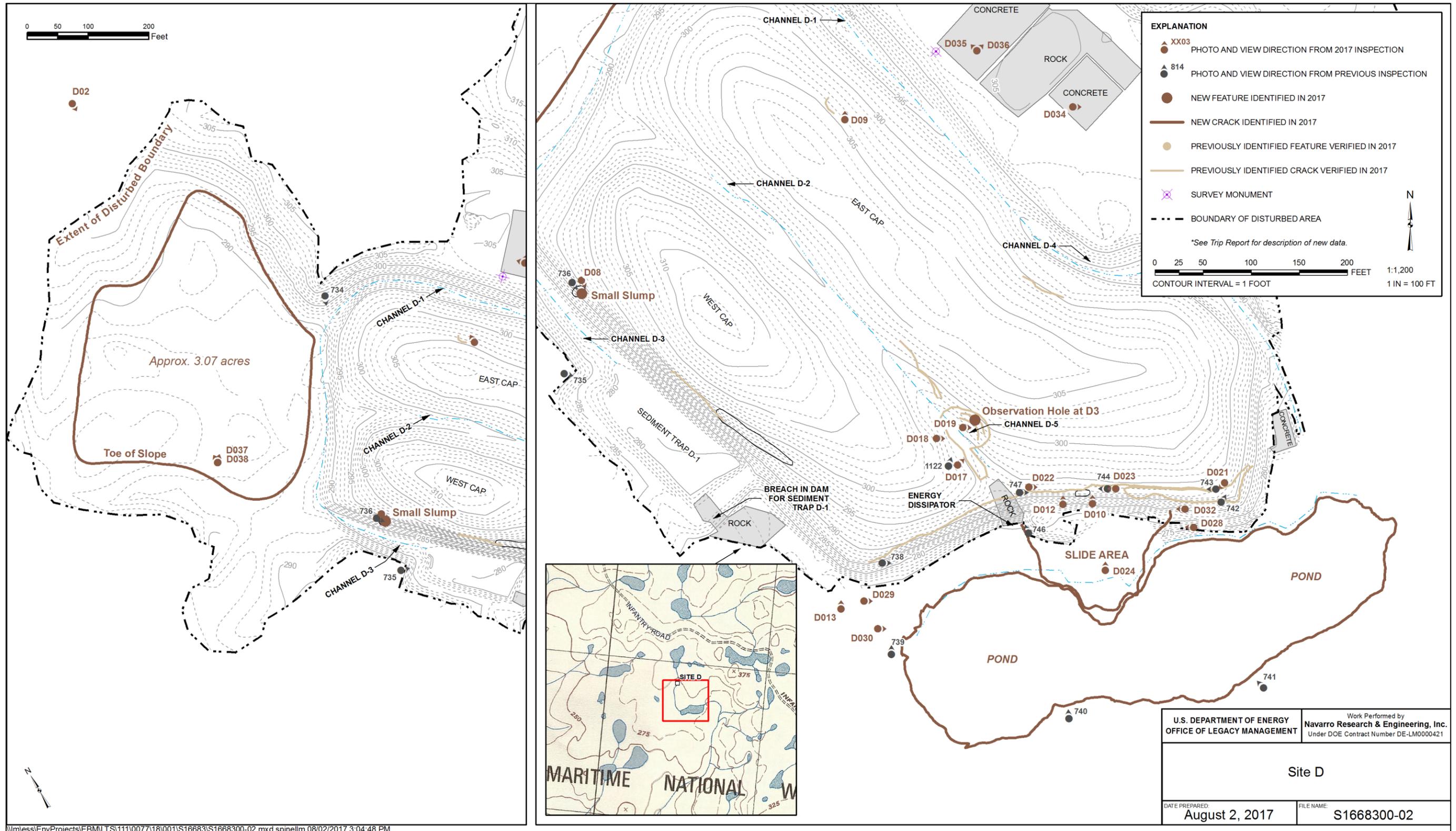
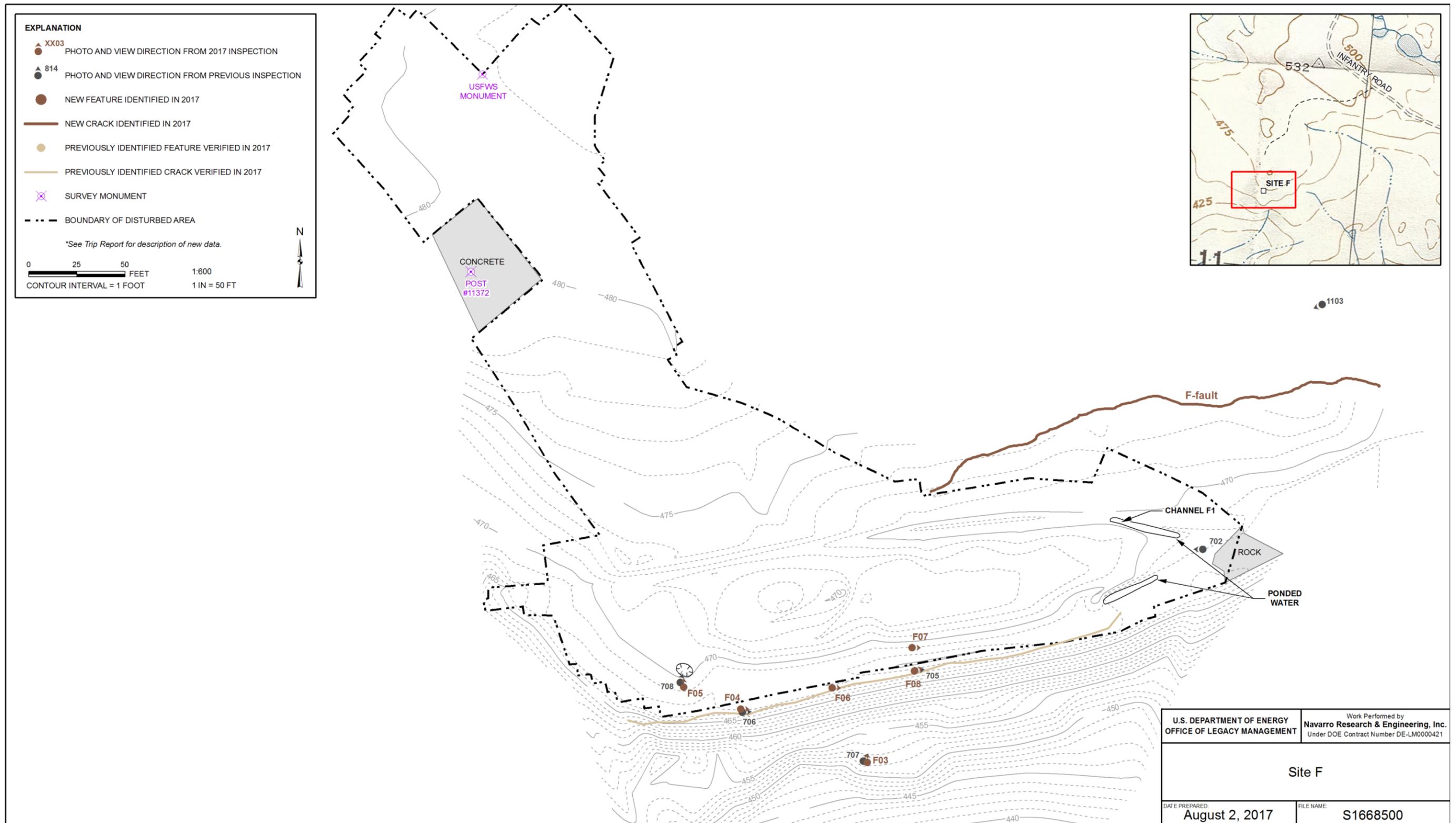
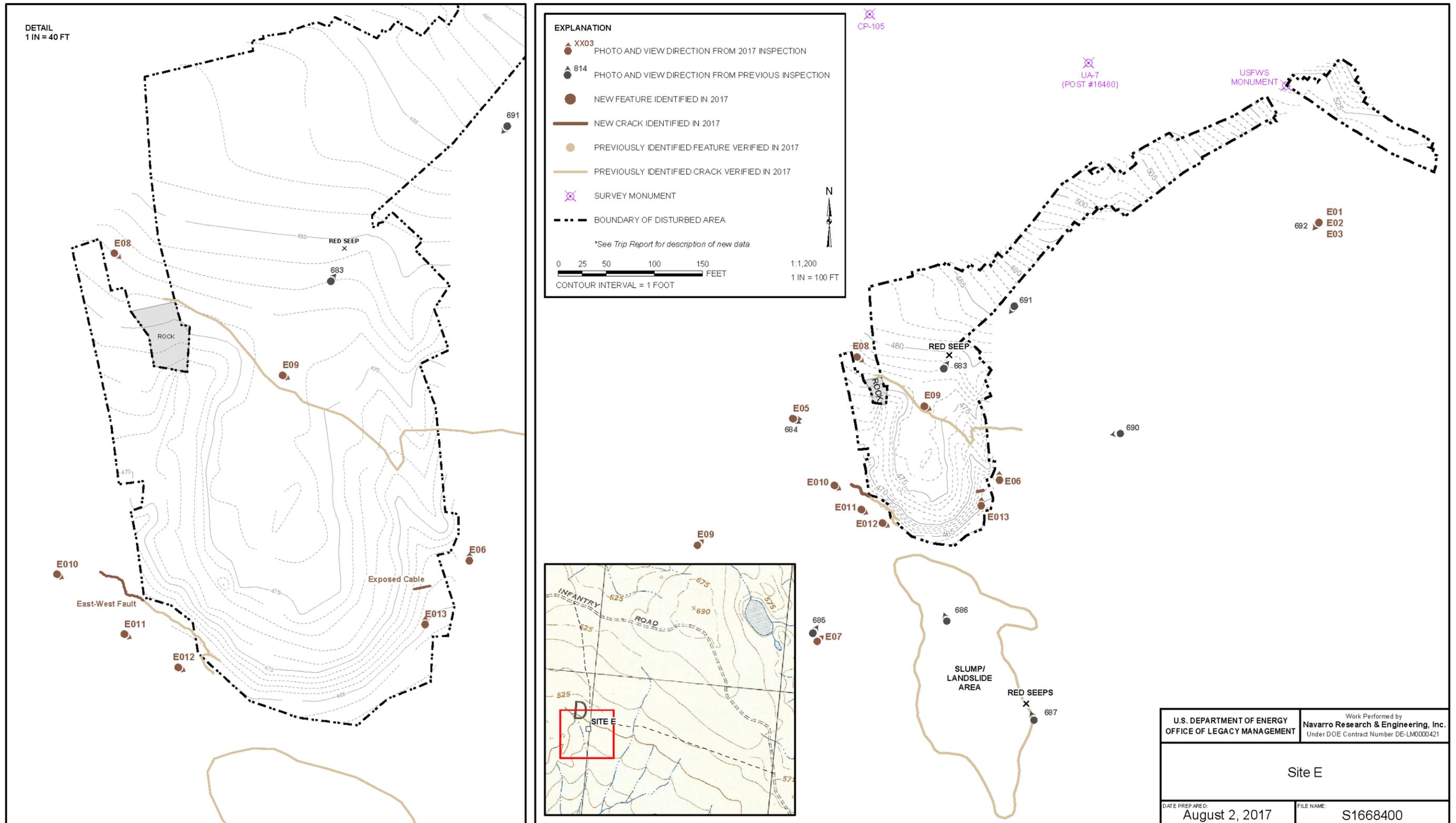


Figure 3. Site D



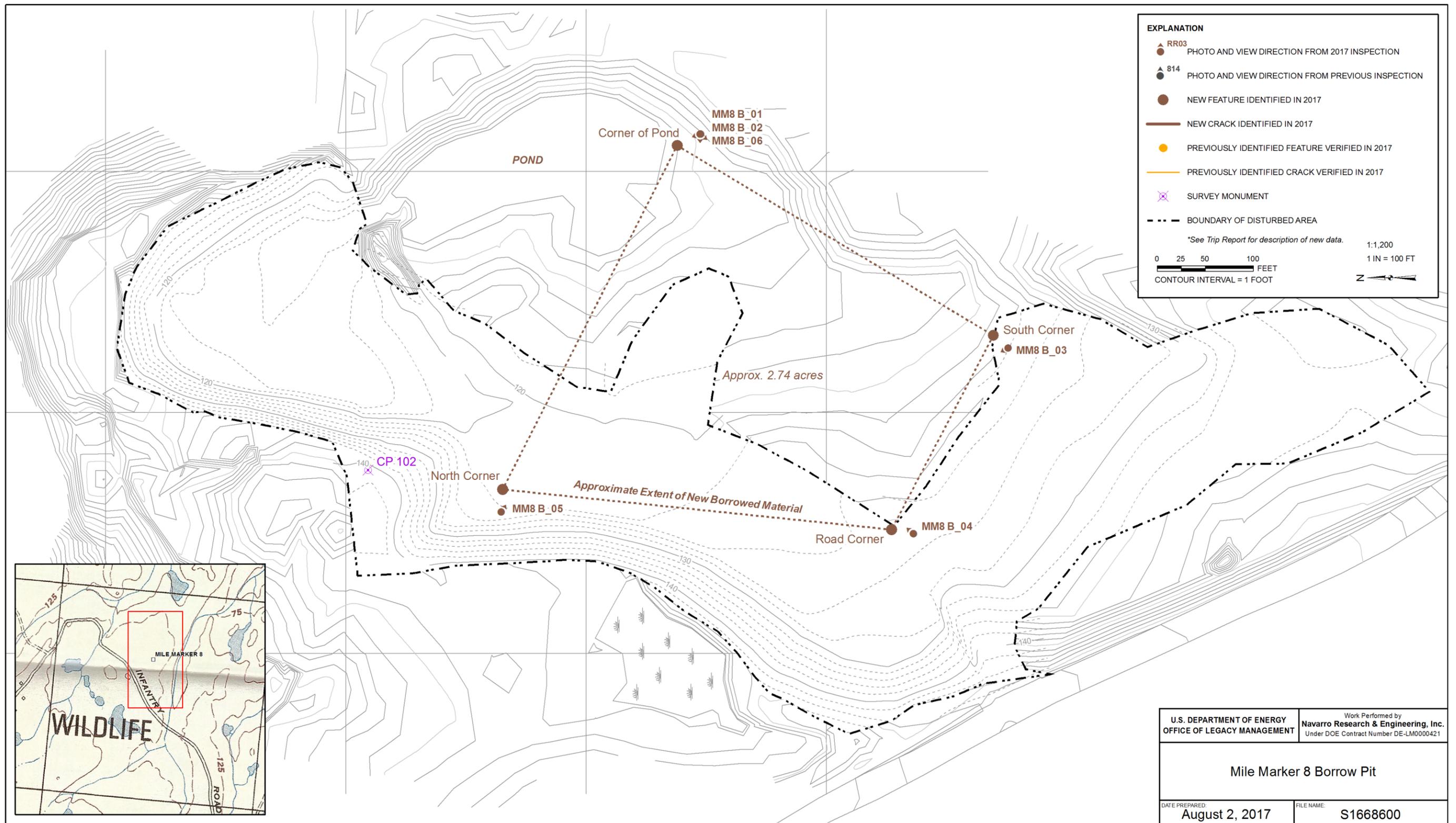
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Figure 4. Site F



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Figure 5. Site E



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Figure 6. MM8 Borrow Pit

U.S. DEPARTMENT OF ENERGY OFFICE OF LEGACY MANAGEMENT	Work Performed by Navarro Research & Engineering, Inc. Under DOE Contract Number DE-LM0000421
Mile Marker 8 Borrow Pit	
DATE PREPARED: August 2, 2017	FILE NAME: S1668600

Appendix B

Mud Pit Inspection Checklists and Photos

Charlie Runway	B-1
Baker Runway.....	B-7
Rifle Range	B-15
Long Shot.....	B-25
Site D	B-37
Site F	B-53
Cannikin Ground Zero	B-63
Cannikin South	B-69
Site E.....	B-75
MM4 Stream Crossing.....	B-89
MM18 Road Damage.....	B-95
MM5 Road Damage.....	B-101
MM8 Borrow Pit Area	B-107

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Mud Pit Inspection Checklists and Photos
Charlie Runway

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Photograph Log

Mud Pit Site: Charlie Runway			
Date	Photo #	Direction of Photo	Description
6/16/2017	CR07	Looking S	Sink hole approximately 12 ft by 16 ft., 7 ft deep, approximately 200 yards from north end on east side
6/16/2017	CR011	Looking E	24-inch-diameter CMP approximately 700 yards from north end, east side
6/16/2017	CR013	Looking W	Wood box and 4-inch wood pipe approximately 800 yards from north end, west side
6/16/2017	CR021	Looking SE	Depression/ponding area approximately 80 ft by 92 ft, 3 inches deep
6/16/2017	CR022	Looking S	Big longitudinal crack on W side, ~350 yards south of taxiway, ~450 yards from south end, ~200 ft long ranges from 4" to 32" width, asphalt is 6" THK, depth ranges from 2" to 10"
6/16/2017	CR025	Looking SE	Depression/ponding area, approximately 250 yards from south end
6/16/2017	CR031	Looking N	Looking north down runway

Note:

The Baker runway will be the primary use runway so not all of the Charlie runway photos are shown. Photos shown are a summary of conditions; additional photos are available upon request.



PL-CR07. Sink hole approximately 12 ft by 16 ft., 7 ft deep, approximately 200 yards from north end on east side



PL-CR011. 24-inch-diameter CMP approximately 700 yards from north end, east side



PL-CR013. Wood box and 4-Inch wood pipe approximately 800 yards from north end, west side



PL-CR021. Depression/ponding area approximately 80 ft by 92 ft, 3 inches deep



PL-CR022. Big longitudinal crack on W side, ~350 yards south of taxiway, ~450 yards from south end, ~200 ft long ranges from 4" to 32" width, asphalt is 6" THK, depth ranges from 2" to 10"



PL-CR025. Depression/ponding area, approximately 250 yards from south end



PL-CR031. Looking north down runway

Mud Pit Inspection Checklists and Photos
Baker Runway

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Photograph Log

Mud Pit Site: Baker Runway			
Date	Photo #	Direction of Photo	Description
6/16/2017	BR03		Old runway light housing, east end
6/16/2017	BR04		Old light housing perpendicular to runway, east end
6/16/2017	BR05		Pond on runway (slightly east of middle of runway)
6/16/2017	BR06		Vegetation rows on old lights (perpendicular to runway)
6/16/2017	BR07		Looking down vegetation on old lights, east end
6/16/2017	BR08		Vegetation on old lights, east end
6/16/2017	BR09		Vegetation looking west standing at east end
6/16/2017	BR010		Vegetation on runway
6/16/2017	BR011		Vegetation looking east, standing at west end



PL-BR03. Old runway light housing, east end



PL-BR04. Old light housing perpendicular to runway, east end



PL-BR05. Pond on runway (slightly east of middle of runway)



PL-BR06. Vegetation rows on old lights (perpendicular to runway)



PL-BR07. Looking down vegetation on old lights, east end



PL-BR08. Vegetation on old lights, east end



PL-BR09. Vegetation looking west standing at east end



PL-BR010. Vegetation on runway



PL-BR011. Vegetation looking east, standing at west end

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Mud Pit Inspection Checklists and Photos

Rifle Range

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AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Rifle Range (RR)	Date of Inspection: June 16, 2017
Responsible Agency: U.S. Department of Energy – Legacy Management	LM Project Manager: Jason Nguyen
Inspector (name, title, organization): Navarro: Stephen Pitton (Site Lead, Inspection Lead), Dan Brennecke (Engineering Manager), Dan Nordeen (Project Engineer)	

- A. General Instructions**
1. All checklist items must be completed and detailed comments made to document the results of the site inspection.
 2. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
 3. Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector's rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
 4. The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
 5. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Mud Pit Closure Plans and As-Built
2. Previous inspection reports reviewed	X		2015 Alternatives Analysis, 2016 Inspection Report
a. Were anomalies or trends detected on previous inspections?	X		From 2014, 2015, 2016 inspections, no new findings
b. Was maintenance performed on areas with anomalies?			Not Applicable
3. Site maintenance and repair records reviewed			No previous maintenance activities were done
a. Has site repair resulted in a change from as-built conditions?			Not Applicable. No repairs have been made
b. Are revised as-builts available that reflect repair changes?			Not Applicable. No repairs have been made

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	
c. Change in the position of nearby washes?		X	
d. Erosion/deposition of nearby washes?	X		Erosion on hillside west of cap near the toe
e. New drainage channels?		X	
f. Change in surrounding vegetation?		X	
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	All signs are in good condition.
b. Signs damaged or removed?		X	All signs are in good condition.
3. Cap			
a. Evidence of subsidence?		X	
b. Evidence of cracking?	X		No new cracks, existing are self-healing
c. Evidence of erosion (wind or water)?		X	
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man? _____ By natural processes? _____			Not Applicable, none exist
f. Do natural processes threaten the integrity of cap or site marker?		X	

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Cannikin Ground Zero (CGZ)	Date of Inspection: June 16, 2017
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C. Site inspection (continued)	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?			Not Applicable, Not inspected
b. Are weedy annual plants present? Do they require removal?			Not Applicable, Not inspected
c. Evidence of animals on cap?			Not Applicable, Not inspected
d. Evidence of excessive plant mortality?			Not Applicable, Not inspected
e. Has a vegetative cover log been completed?			Not Applicable, Not inspected
5. Photo Documentation			
a. Has a photo log been prepared?			Not Applicable, Not inspected
b. How many photos were taken?			

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	Currently annual inspection will be performed
3. Are existing maintenance actions satisfactory?		X	Not Applicable, No maintenance was done or required
4. Are existing repair actions satisfactory?			Not Applicable, No maintenance was done or required
5. Is other maintenance/repair necessary?		X	
6. Rationale for field conclusions: See attached trip report			
7. Factors contributing to or impacting inspection:			

E. Certification	
I certify that I have conducted an inspection of the Rifle Range Mud Pit Site cap in accordance with the discussed and approved annual inspection criteria as recorded on this checklist, discussion in Trip Report, field notes, and photos.	
Inspector Printed Name: Stephen Pitton	Inspector Signature:
Title: Site Lead, Inspection Lead	Date:

Photograph Log

Mud Pit Site: Rifle Range			
Date	Photo #	Direction of Photo	Description
6/16/2017	RR01	Looking SE	West end of RR2 crack looking southeast, shows signs of self-healing from previous years
6/16/2017	RR02	Looking E, SE	West end of RR1 crack looking east, southeast shows signs of self-healing from previous years
6/16/2017	RR03	Looking SE	RR2 crack looking southeast
6/16/2017	RR04	Looking N, NE	Rifle Range borrow area looking north, northeast
6/16/2017	RR05	Looking N, NE	Rifle Range borrow area looking north, northeast
6/16/2017	RR06	Looking NE	Rifle Range borrow area looking northeast
6/16/2017	RR07	Looking NE	Rifle Range borrow area looking northeast
6/16/2017	RR08	Looking SE	Ponded water near toe at southeast end of cap



PL-RR01. West end of RR2 crack looking southeast, shows signs of self-healing from previous years



PL-RR02. West end of RR1 crack looking east, southeast shows signs of self-healing from previous years



PL-RR03. RR2 crack looking southeast



PL-RR04. Rifle Range borrow area looking north, northeast



PL-RR05. Rifle Range borrow area looking north, northeast



PL-RR06. Rifle Range borrow area looking northeast



PL-RR07. Rifle Range borrow area looking northeast



PL-RR08. Ponded water near toe at southeast end of cap

Mud Pit Inspection Checklists and Photos

Long Shot

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AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Long Shot (LS)	Date of Inspection: June 19, 2017
Responsible Agency: U.S. Department of Energy – Legacy Management	LM Project Manager: Jason Nguyen
Inspector (name, title, organization): Navarro: Stephen Pitton (Site Lead, Inspection Lead), Dan Brennecke (Engineering Manager), Dan Nordeen (Project Engineer)	

- A. General Instructions**
- All checklist items must be completed and detailed comments made to document the results of the site inspection.
 - The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
 - Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector's rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
 - The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
 - A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Mud Pit Closure Plans and As-Built
2. Previous inspection reports reviewed	X		2015 Alternatives Analysis, 2016 Inspection Report
a. Were anomalies or trends detected on previous inspections?	X		From 2014, 2015, 2016 inspections, no new findings
b. Was maintenance performed on areas with anomalies?		X	No maintenance has been done on any of the effects resulting from the earthquake
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were done
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from as-built condition
b. Are revised as-builts available that reflect repair changes?			Not Applicable. No repairs have been made

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and as-built drawings
c. Change in the position of nearby washes?		X	None detected
d. Erosion/deposition of nearby washes?		X	None detected
e. New drainage channels?		X	None detected
f. Change in surrounding vegetation?		X	None detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	USFWS Monument was present/good condition. Ground Zero Monument was intact
b. Signs damaged or removed?		X	All signs are all in good condition.
3. Cap			
a. Evidence of subsidence?	X		Several small depressions in S part of mud pit cap as noted in trip report
b. Evidence of cracking?	X		Four cracks and associated small slumps from the 2014 earthquake are in the SW, NE, and SE parts of the mud pit cap. No changes from previous inspection.
c. Evidence of erosion (wind or water)?	X		Some rills on steep slopes in the NE and SW sides of the mud pit cap, as noted in the trip report
d. Evidence of animal burrowing?	X		Some small holes along E base of mud pit cap and along N side, as noted in the trip report
e. Are site markers disturbed? By man? _____ By natural processes? _____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Long Shot (LS)	Date of Inspection: June 19, 2017
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C. Site inspection (continued)	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?			Not Applicable, not inspected
b. Are weedy annual plants present? Do they require removal?			Not Applicable, not inspected
c. Evidence of animals on cap?			Not Applicable, not inspected
d. Evidence of excessive plant mortality?			Not Applicable, not inspected
e. Has a vegetative cover log been completed?			Not Applicable, not inspected
5. Photo Documentation			
a. Has a photo log been prepared?			Not Applicable, not inspected
b. How many photos were taken?			

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	Currently annual inspection will be performed
3. Are existing maintenance actions satisfactory?			Not Applicable. No maintenance was done or required.
4. Are existing repair actions satisfactory?			Not Applicable. No repairs were done or required.
5. Is other maintenance/repair necessary?		X	
6. Rationale for field conclusions: See attached trip report			
7. Factors contributing to or impacting inspection: None noted			

E. Certification	
I certify that I have conducted an inspection of the Long Shot Mud Pit Site cap in accordance with the discussed and approved annual inspection criteria as recorded on this checklist, discussion in Trip Report, field notes, and photos.	
Inspector Printed Name: Stephen Pitton	Inspector Signature:
Title: Site Lead, Inspection Lead	Date:

Photograph Log

Mud Pit Site: Long Shot			
Date	Photo #	Direction of Photo	Description
6/19/2017	LS01	Looking E	Duplication of slump/scarp in southwest corner from previous inspections (IMG_801 from 2016 report)
6/19/2017	LS02	Looking N	Rills along east, southeast side
6/19/2017	LS03	Looking W	Small holes near east base (IMG_794 from 2016 report)
6/19/2017	LS04	Looking W	Small hole near east base (IMG_794 from 2016 report)
6/19/2017	LS05	Looking S	Crack along east side near toe of slope
6/19/2017	LS06	Looking S	Crack along east side near toe of slope
6/19/2017	LS07	Looking N, NE	Crack along east side near toe of slope (IMG_793 from 2016 report)
6/19/2017	LS08	Looking S, SE	Crack along northwest side, duplicate of IMG_797 from 2016 report
6/19/2017	LS09	Looking W	Crack approximately mid slope (half way between top and toe), duplicate of IMG_798 from 2016 report
6/19/2017	LS010	Looking S	Duplicate of IMG_803 from 2016 report
6/19/2017	LS011	Looking S	Small holes (new) along northeast side of cap, approximately 3 inches diameter, approximately 9 holes counted
6/19/2017	LS012	Looking W	Duplicate of IMG_799 from 2016 report
6/19/2017	LS013	Looking E	Undulating surface along entire south side, photo taken from approximately middle of cap looking east



PL-LS01. Duplication of slump/scarp in southwest corner from previous inspections (IMG_801 from 2016 report)



PL-LS02. Rills along east, southeast side



PL-LS03. Small holes near east base (IMG_794 from 2016 report)



PL-LS04. Small hole near east base (IMG_794 from 2016 report)



PL-LS05. Crack along east side near toe of slope



PL-LS06. Crack along east side near toe of slope



PL-LS07. Crack along east side near toe of slope (IMG_793 from 2016 report)



PL-LS08. Crack along northeast side, duplicate of IMG_797 from 2016 report



PL-LS09. Crack approximately mid slope (half way between top and toe), duplicate of IMG_798 from 2016 report



PL-LS010. Duplicate of IMG_803 from 2016 report



PL-LS 011. Small holes (new) along northeast side of cap, approximately 3 inches diameter, approximately 9 holes counted



PL-LS012. Duplicate of IMG_799 from 2016 report



PL-LS013. Undulating surface along entire south side, photo taken from approximately middle of cap looking east

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Mud Pit Inspection Checklists and Photos
Site D

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AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Drill Site D	Date of Inspection: June 18, 2017
Responsible Agency: U.S. Department of Energy – Legacy Management	Project Manager: Jason Nguyen
Inspector (name, title, organization): Navarro: Stephen Pitton (Site Lead, Inspection Lead), Dan Brennecke (Engineering Manager), Dan Nordeen (Project Engineer)	

- A. General Instructions**
- All checklist items must be completed and detailed comments made to document the results of the site inspection.
 - The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
 - Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector's rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
 - The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
 - A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Mud Pit Closure Plans and As-Built
2. Previous inspection reports reviewed	X		2015 Alternatives Analysis, 2016 Inspection Report
a. Were anomalies or trends detected on previous inspections?	X		From 2014, 2015, 2016 inspections, no new findings
b. Was maintenance performed on areas with anomalies?		X	No maintenance has been done on any of the effects resulting from the earthquake
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were done
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from as-built condition
b. Are revised as-builts available that reflect repair changes?			Not Applicable. No repairs have been made

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and as-built drawings
c. Change in the position of nearby washes?		X	None detected
d. Erosion/deposition of nearby washes?		X	None detected
e. New drainage channels?		X	Breach in dam for Sediment Trap D-1 just W of Overflow Spillway, no changes from past inspections
f. Change in surrounding vegetation?		X	None detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	USFWS Monument was present/Good condition
b. Signs damaged or removed?	X		Most signs are all in good condition several need to be replaced along north and east sides (4 total)
3. Cap			
a. Evidence of subsidence?		X	
b. Evidence of cracking?	X		A long, semi-continuous crack and associated scarps and slumps are along the S sides of E and W mud pit caps. Several other cracks and small slumps also occur, mostly on the E mud pit cap. All are effects of the 2014 earthquake. No changes in condition from previous inspections on major failures, small cracks appear to be self-healing.
c. Evidence of erosion (wind or water)?		X	No evidence was observed

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Drill Site D	Date of Inspection: June 18, 2017
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C (continued). Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
d. Evidence of animal burrowing?		X	No holes or burrowing was observed
e. Are site markers disturbed? By man? _____ By natural processes? _____		X	No site markers exist, only IC signs
f. Do natural processes threaten the integrity of cap or site marker?	X		Another large earthquake could cause additional slumping along the S sides of the mud pit caps that could breach the geomembrane.
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?			Not Applicable, Not inspected
b. Are weedy annual plants present? Do they require removal?			Not Applicable, Not inspected
c. Evidence of animals on cap?			Not Applicable, Not inspected
d. Evidence of excessive plant mortality?			Not Applicable, Not inspected
e. Has a vegetative cover log been completed?			Not Applicable, Not inspected
5. Photo Documentation			
a. Has a photo log been prepared?			Not Applicable, Not inspected
b. How many photos were taken?			

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	Currently annual inspections will be performed
3. Are existing maintenance actions satisfactory?			Not Applicable. No maintenance was done or required.
4. Are existing repair actions satisfactory?			Not Applicable. No repairs were done or required.
5. Is other maintenance/repair necessary?		X	
6. Rationale for field conclusions: See attached trip report			
7. Factors contributing to or impacting inspection: None noted			

E. Certification	
I certify that I have conducted an inspection of the Drill Site D Mud Pit Site cap in accordance with the discussed and approved annual inspection criteria as recorded on this checklist, discussion in Trip Report, field notes, and photos.	
Inspector Printed Name: Stephen Pitton	Inspector Signature:
Title: Site Lead, Inspection Lead	Date:

Photograph Log

Mud Pit Site: Site D			
Date	Photo #	Direction of Photo	Description
6/18/2017	D02	Looking S	Zoom from Infantry road looking south showing proposed area for new combined Site E and Site F mud pit
6/18/2017	D08	Looking S, SE	Depression/ponding area southwest side of west cap, duplicate of IMG_736 from 2016 report
6/18/2017	D09	Looking N	Standing south looking north of crack labeled "site d5" on 2014 inspection, crack appears to be self-healing
6/18/2017	D010	Looking N	Exposed liner on south side of cap, approximately 3 feet 4 inches deep to where liner transitions from vertical to horizontal in anchor trench (east exposed section)
6/18/2017	D012	Looking N	Exposed liner on south side of cap, approximately 12 inches wide, 24 inches vertical uncovered (west exposed section)
6/18/2017	D013	Looking E	South side of cap damaged area standing southeast of south spillway looking east
6/18/2017	D017	Looking N, NE	Looking north, northeast at terracing slump/failure on east cap, duplicate of IMG_01122 from 2016 report
6/18/2017	D018	Looking E	Trying to find liner; none found but perched water continued to seep into investigation hole, dug approximately 24 inches down, total depth below existing top of cover approximately 3 ft, seep flow rate approximately 0.5 to 1 gallon per minute (gpm)
6/18/2017	D019	Looking E	Final condition hole from D018 after filling it in
6/18/2017	D021	Looking W, SW	Standing on southeast corner of cap looking west, similar to IMG_743 of 2016 report
6/18/2017	D022	Looking E	Standing on west side of exposed liner looking east
6/18/2017	D023	Looking W	Standing on east side of exposed liner looking west, duplicate of IMG_744 from 2016 report
6/18/2017	D024	Looking N	Standing south of south side failure looking north
6/18/2017	D028	Looking W	Standing at south toe of west cap looking west at possible equipment access
6/18/2017	D029	Looking N	Looking north toward sediment trap
6/18/2017	D030	Looking E	Standing at southwest corner toe of west cap looking east at possible equipment access
6/18/2017	D032	Looking W	Standing mid slope on southwest side looking west along failure zone
6/18/2017	D034	Looking E	Standing on concrete pad looking east toward hillside for possible borrow material
6/18/2017	D035	Looking NE	Standing on concrete pad looking northeast toward hillside for possible borrow material (old Site D borrow area is in the background)
6/18/2017	D036	Looking NW	Standing on concrete pad looking northwest for access to proposed area for new combined Site E and Site F mud pit (U.S. Fish and Wildlife Service [USFWS] monument shown)
6/18/2017	D037	Looking N, NE	Standing west of west cap looking north, northeast across proposed area for new combined Site E and Site F mud pit
6/18/2017	D038	Looking N	Standing west of west cap looking north across proposed area for new combined Site E and Site F mud pit

Note:

Only noteworthy photos are listed to support this trip report. Additional photos available upon request.



PL-D02. Zoom from Infantry road looking south showing proposed area for new combined Site E and Site F mud pit



PL-D08. Depression/ponding area southwest side of west cap, duplicate of IMG_736 from 2016 report



PL-D09. Standing south looking north of crack labeled "site d5" on 2014 inspection, crack appears to be self-healing



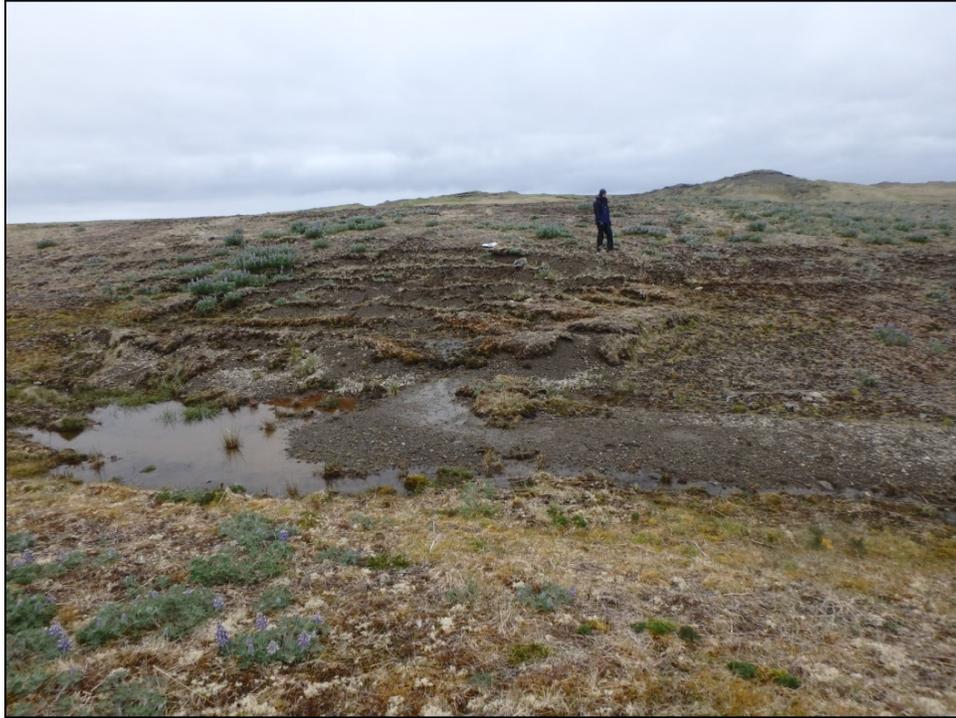
PL-D010. Exposed liner on south side of cap, approximately 3 feet 4 inches deep to where liner transitions from vertical to horizontal in anchor trench (east exposed section)



PL-D012. Exposed liner on south side of cap, approximately 12 inches wide, 24 inches vertical uncovered (west exposed section)



PL-D013. South side of cap damaged area standing southeast of south spillway looking east



PL-D017. Looking north, northeast at terracing slump/failure on east cap, duplicate of IMG_01122 from 2016 report



PL-D018. Trying to find liner; none found but perched water continued to seep into investigation hole, dug approximately 24 inches down, total depth below existing top of cover approximately 3 ft, seep flow rate approximately 0.5 to 1 gpm



PL-D019. Final condition hole from D018 after filling it in



PL-D021. Standing on southeast corner of cap looking west, similar to IMG_743 of 2016 report



*PL-D022. Standing on west side of exposed liner looking east,
duplicate of IMG_744 from 2016 report*



*PL-D023. Standing on east side of exposed liner looking west,
duplicate of IMG_744 from 2016 report*



PL-D024. Standing south of south side failure looking north



PL-D028. Standing at south toe of west cap looking west at possible equipment access



PL-D029. Looking north toward sediment trap



*PL-D030. Standing at southwest corner toe of west cap
looking east at possible equipment access*



PL-D032. Standing mid slope on southeast side looking west along failure zone



*PL-D034. Standing on concrete pad
looking east towards hillside for possible borrow material*



PL-D035. Standing on concrete pad looking northeast toward hillside for possible borrow material (old Site D borrow area is in the background)



PL-D036. Standing on concrete pad looking north for access to proposed area for new combined Site E and Site F mud pit (USFWS monument shown)



PL-D037. Standing west of west cap looking north, northeast across proposed area for new combined Site E and Site F mud pit



PL-D038. Standing west of west cap looking north across proposed area for new combined Site E and Site F mud pit

Mud Pit Inspection Checklists and Photos

Site F

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AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Drill Site F (DSF)	Date of Inspection: June 17, 2017
Responsible Agency: U.S. Department of Energy – Legacy Management	Project Manager: Jason Nguyen
Inspector (name, title, organization): Navarro: Stephen Pitton (Site Lead, Inspection Lead), Dan Brennecke (Engineering Manager), Dan Nordeen (Project Engineer)	

- A. General Instructions**
- All checklist items must be completed and detailed comments made to document the results of the site inspection.
 - The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
 - Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector's rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
 - The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
 - A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Mud Pit Closure Plans and As-Built
2. Previous inspection reports reviewed	X		2015 Alternatives Analysis, 2016 Inspection Report
a. Were anomalies or trends detected on previous inspections?	X		From 2014, 2015, 2016 inspections, no new findings
b. Was maintenance performed on areas with anomalies?		X	No maintenance has been done on any of the effects resulting from the earthquake
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were done
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from as-built condition
b. Are revised as-builts available that reflect repair changes?			Not Applicable. No repairs have been made

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and as-built drawings
c. Change in the position of nearby washes?		X	None detected
d. Erosion/deposition of nearby washes?		X	None detected
e. New drainage channels?		X	None detected
f. Change in surrounding vegetation?		X	None detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	USFWS Monument was present/Good condition
b. Signs damaged or removed?		X	All signs are in good condition.
3. Cap			
a. Evidence of subsidence?	X		Vegetation continues to cover the small area of subsidence seen in the 2006 inspection
b. Evidence of cracking?	X		A long crack and associated slump from the 2014 earthquake are along the S edge of the mud pit cap (outside the cap boundary). Another long crack/scarp is NE of the mud pit cap (outside the cap boundary).
c. Evidence of erosion (wind or water)?		X	Ponded water in Channel F1 at the E end of the mud pit cap noted in this and past inspections could lead to future erosion
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man? _____ By natural processes? _____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	At this time the longitudinal crack/scarp NE of the cap does not impact the mud pit but if erosion continues global failure may occur. If the scarp south of the cap continues to erode then it may impact the integrity of the cap's south side.

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Drill Site F

Date of Inspection: June 17, 2017

C. Site inspection (continued)	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?			Not Applicable, not inspected
b. Are weedy annual plants present? Do they require removal?			Not Applicable, not inspected
c. Evidence of animals on cap?			Not Applicable, not inspected
d. Evidence of excessive plant mortality?			Not Applicable, not inspected
e. Has a vegetative cover log been completed?			Not Applicable, not inspected
5. Photo Documentation			
a. Has a photo log been prepared?			Not Applicable, not inspected
b. How many photos were taken?			

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	Currently annual inspection will be performed
3. Are existing maintenance actions satisfactory?			Not Applicable. No maintenance was done or required.
4. Are existing repair actions satisfactory?			Not Applicable. No repairs were done or required.
5. Is other maintenance/repair necessary?		X	
6. Rationale for field conclusions: See attached trip report			
7. Factors contributing to or impacting inspection: None noted			

E. Certification	
I certify that I have conducted an inspection of the Drill Site F cap in accordance with the discussed and approved annual inspection criteria as recorded on this checklist, discussion in Trip Report, field notes, and photos.	
Inspector Printed Name: Stephen Pitton	Inspector Signature:
Title: Site Lead, Inspection Lead	Date:

Photograph Log

Mud Pit Site: Site F			
Date	Photo #	Direction of Photo	Description
6/17/2017	F01		Brass cap on bent steel pipe marked U.S. Coast & Geodetic Survey Reference Mark, 2 MOTEL, 1949
6/17/2017	F02	Looking NW	Slightly bent pipe with survey marker, 2 MOTEL, 1949
6/17/2017	F03	Looking N	South side of cap looking north along scarp, duplicate photo of crack on south side (IMG_707 from 2016 report)
6/17/2017	F04	Looking E	South side of cap looking east along scarp, duplicate photo of crack on south side (IMG_706 from 2016 report)
6/17/2017	F05	Looking N	Depression in southwest part of cap, duplicate of IMG_708 from 2016 report
6/17/2017	F06	Looking E	South side of cap looking east
6/17/2017	F07	Looking E	South side of cap looking east approximately from cap midpoint, three terraces of scarp (upper approximately 6 to 12 inches deep, middle 6 to 18 inches deep, lower 6 to 18 inches deep)
6/17/2017	F08	Looking E, NE	South side of cap looking east, duplicate of IMG_705 from 2016 report



PL-F01. Brass cap on bent steel pipe marked U.S. Coast & Geodetic Survey Reference Mark, 2 MOTEL, 1949



PL-F02. Slightly bent pipe with survey marker, 2 MOTEL, 1949



PL-F03. South side of cap looking north along scarp, duplicate photo of crack on south side (IMG_707 from 2016 report)



PL-F04. South side of cap looking east along scarp, duplicate photo of crack on south side (IMG_706 from 2016 report)



PL-F05. Depression in southwest part of cap, duplicate of IMG_708 from 2016 report



PL-F06. South side of cap looking east



PL-F07. South side of cap looking E approximately from cap midpoint, three terraces of scarp (Upper approximately 6 to 12 inches deep, middle 6 to 18 inches deep, lower 6 to 18 inches deep)



PL-F08. South side of cap looking east, duplicate of IMG_705 from 2016 report

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Mud Pit Inspection Checklists and Photos

Cannikin Ground Zero

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AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Cannikin Ground Zero (CGZ)	Date of Inspection: June 17, 2017
Responsible Agency: U.S. Department of Energy – Legacy Management	Project Manager: Jason Nguyen
Inspector (name, title, organization): Navarro: Stephen Pitton (Site Lead, Inspection Lead), Dan Brennecke (Engineering Manager), Dan Nordeen (Project Engineer)	

- A. General Instructions**
- All checklist items must be completed and detailed comments made to document the results of the site inspection.
 - The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
 - Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector’s rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
 - The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
 - A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Mud Pit Closure Plans and As-Built
2. Previous inspection reports reviewed	X		2015 Alternatives Analysis, 2016 Inspection Report
a. Were anomalies or trends detected on previous inspections?	X		From 2014, 2015, 2016 inspections, no new findings
b. Was maintenance performed on areas with anomalies?			Not Applicable
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were done
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from as-built condition
b. Are revised as-builts available that reflect repair changes?			Not Applicable. No repairs have been made

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and as-built drawings
c. Change in the position of nearby washes?		X	None detected
d. Erosion/deposition of nearby washes?		X	None detected
e. New drainage channels?		X	None detected
f. Change in surrounding vegetation?		X	None detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	All signs are in good condition
b. Signs damaged or removed?		X	All signs are in good condition.
3. Cap			
a. Evidence of subsidence?			
b. Evidence of cracking?		X	
c. Evidence of erosion (wind or water)?		X	
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man? _____ By natural processes? _____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Cannikin Ground Zero (CGZ) Date of Inspection: June 19, 2017

C. Site inspection (continued)	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?			Not Applicable, Not inspected
b. Are weedy annual plants present? Do they require removal?			Not Applicable, Not inspected
c. Evidence of animals on cap?			Not Applicable, Not inspected
d. Evidence of excessive plant mortality?			Not Applicable, Not inspected
e. Has a vegetative cover log been completed?			Not Applicable, Not inspected
5. Photo Documentation			
a. Has a photo log been prepared?			Not Applicable, Not inspected
b. How many photos were taken?			

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	Currently annual inspection will be performed
3. Are existing maintenance actions satisfactory?			Not Applicable. No maintenance was done or required.
4. Are existing repair actions satisfactory?			Not Applicable. No repairs were done or required.
5. Is other maintenance/repair necessary?		X	
6. Rationale for field conclusions: See attached trip report			
7.			
8. Factors contributing to or impacting inspection: None noted			

E. Certification	
I certify that I have conducted an inspection of the Cannikin Ground Zero Mud Pit Site cap in accordance with the discussed and approved annual inspection criteria as recorded on this checklist, discussion in Trip Report, field notes, and photos.	
Inspector Printed Stephen Pitton	Inspector Signature:
Title: Inspection Site Lead, Inspection Lead	Date:

Photograph Log



View east of Cannikin ground zero

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Mud Pit Inspection Checklists and Photos

Cannikin South

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AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Cannikin South (CS)	Date of Inspection: June 17, 2017
Responsible Agency: U.S. Department of Energy – Legacy Management	Project Manager: Jason Nguyen
Inspector (name, title, organization): Navarro: Stephen Pitton (Site Lead, Inspection Lead), Dan Brennecke (Engineering Manager), Dan Nordeen (Project Engineer)	

- A. General Instructions**
- All checklist items must be completed and detailed comments made to document the results of the site inspection.
 - The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
 - Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector’s rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
 - The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
 - A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Mud Pit Closure Plans and As-Built
2. Previous inspection reports reviewed	X		2015 Alternatives Analysis, 2016 Inspection Report
a. Were anomalies or trends detected on previous inspections?	X		From 2014, 2015, 2016 inspections, no new findings
b. Was maintenance performed on areas with anomalies?			Not Applicable
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were done
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from as-built condition
b. Are revised as-builts available that reflect repair changes?			Not Applicable. No repairs have been made

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and as-built drawings
c. Change in the position of nearby washes?		X	None detected
d. Erosion/deposition of nearby washes?		X	None detected
e. New drainage channels?		X	None detected
f. Change in surrounding vegetation?		X	None detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	All signs are in good condition
b. Signs damaged or removed?		X	All signs are in good condition.
3. Cap			
a. Evidence of subsidence?		X	
b. Evidence of cracking?		X	
c. Evidence of erosion (wind or water)?		X	
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man? _____ By natural processes? _____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Cannikin South (CS)

Date of Inspection: June 17, 2017

C. Site inspection (continued)

	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?			Not Applicable, Not inspected
b. Are weedy annual plants present? Do they require removal?			Not Applicable, Not inspected
c. Evidence of animals on cap?			Not Applicable, Not inspected
d. Evidence of excessive plant mortality?			Not Applicable, Not inspected
e. Has a vegetative cover log been completed?			Not Applicable, Not inspected
5. Photo Documentation			
a. Has a photo log been prepared?			Not Applicable, Not inspected
b. How many photos were taken?			

D. Field Conclusions

1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	Currently annual inspection will be performed
3. Are existing maintenance actions satisfactory?			Not Applicable. No maintenance was done or required.
4. Are existing repair actions satisfactory?			Not Applicable. No repairs were done or required.
5. Is other maintenance/repair necessary?		X	
6. Rationale for field conclusions: See attached trip report			
7. Factors contributing to or impacting inspection: None noted			

E. Certification

I certify that I have conducted an inspection of the Cannikin South Mud Pit Site cap in accordance with the discussed and approved annual inspection criteria as recorded on this checklist, discussion in Trip Report, field notes, and photos.

Inspector Printed Name: Stephen Pitton

Inspector Signature:

Title: Site Lead, Inspection Lead

Date:

Photograph Log



View northwest of Cannikin south mud pit cap with Cannikin Lake in background

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Mud Pit Inspection Checklists and Photos

Site E

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AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Drill Site E	Date of Inspection: June 17, 2017
Responsible Agency: U.S. Department of Energy – Legacy Management	Project Manager: Mark Kautsky
Inspector (name, title, organization): Craig Goodknight, Inspection Team Lead, Navarro	

- A. General Instructions**
- All checklist items must be completed and detailed comments made to document the results of the site inspection.
 - The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
 - Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector’s rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
 - The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
 - A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Mud Pit Closure Plans and As-Built
2. Previous inspection reports reviewed	X		2006 and 2011 Inspection Reports
a. Were anomalies or trends detected on previous inspections?	X		From 2014 Post-Earthquake Investigation
b. Was maintenance performed on areas with anomalies?		X	No maintenance has been done on any of the effects resulting from the earthquake
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were done
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from as-built condition
b. Are revised as-builts available that reflect repair changes?			Not Applicable. No repairs have been made.

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and as-built drawings
c. Change in the position of nearby washes?		X	None detected
d. Erosion/deposition of nearby washes?	X		Active drainage and erosion below slump scarp, just S of mud pit cap. Two areas of reddish-brown seeps are N and S of mud pit cap.
e. New drainage channels?		X	None detected
f. Change in surrounding vegetation?		X	None detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	USFWS Monument was present/Good condition
b. Signs damaged or removed?		X	New sign installed at USFWS Monument. Other signs were in good condition.
3. Cap			
a. Evidence of subsidence?		X	
b. Evidence of cracking?	X		Two cracks from the 2014 earthquake are just N and SW of mud pit cap. No change from previous inspection.
c. Evidence of erosion (wind or water)?		X	
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man? _____ By natural processes? _____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	

C. Site inspection (continued)		YES	NO	EXPLANATION
4. Vegetative cover				
a.	Is plant cover adequate to prevent erosion?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable, Not inspected
b.	Are weedy annual plants present? Do they require removal?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable, Not inspected
c.	Evidence of animals on cap?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable, Not inspected
d.	Evidence of excessive plant mortality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable, Not inspected
e.	Has a vegetative cover log been completed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable, Not inspected
5. Photo Documentation				
a.	Has a photo log been prepared?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable, Not inspected
b.	How many photos were taken?			
D. Field Conclusions				
1.	Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2.	Are more frequent inspections required?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3.	Are existing maintenance actions satisfactory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable. No maintenance was done or required.
4.	Are existing repair actions satisfactory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not Applicable. No repairs were done or required.
5.	Is other maintenance/repair necessary?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6.	Rationale for field conclusions: See attached trip report			
7.	Factors contributing to or impacting inspection: None noted			
E. Certification				
I certify that I have conducted an inspection of the Drill Site E Mud Pit Site cap in accordance with the discussed and approved annual inspection criteria as recorded on this checklist, discussion in Trip Report, field notes, and photos..				
Inspector Printed Name: Stephen Pitton			Inspector Signature:	
Title: Site Lead, Inspection Lead			Date:	

Photograph Log

Mud Pit Site: Site E			
Date	Photo #	Direction of Photo	DESCRIPTION
6/17/2017	E01	Looking SW	Photo from well/parking area, duplicate of IMG_692 from 2016 report
6/17/2017	E02	Looking SW	Zoomed photo from well/parking area, similar to IMG_691 from 2016 report
6/17/2017	E03	Looking S, SW	Photo from well/parking area that captures the drainage going to Pacific Ocean
6/17/2017	E04	Looking E, NE	Photo from west looking east from approximately 75 yards away
6/17/2017	E05	Looking E	Photo from west looking east from approximately 200 ft away, duplicate of IMG_684 from 2016 report
6/17/2017	E06	Looking N	East drainage channel
6/17/2017	E07	Looking N, NE	Slump/scarp area south of cap looking northeast, looks similar to previous years with no new conditions observed
6/17/2017	E08	Looking E, SE	North scarp at west end looking east, depth varies from approximately 2 inches to 2.5 ft
6/17/2017	E09	Looking E, SE	North scarp at approximately mid cap looking east, approximately 2.0 ft exposed
6/17/2017	E010	Looking E, SE	South scarp at west end looking east, covered in vegetation
6/17/2017	E011	Looking E, SE	South scarp at west of centerline looking east, some areas covered in vegetation, exposed areas approximately 6 inches wide and 8 to 12 inches deep
6/17/2017	E012	Looking E, SE	South scarp at west of centerline looking east, extension/additional crack that was previously covered in vegetation, added to previously mapped scarp
6/17/2017	E013	Looking N	East drainage looking north, .5-inch-diameter black cable exposed crossing drainage and partially buried in cap



PL-E01. Photo from well/parking area, duplicate of IMG_692 from 2016 report



PL-E02. Zoomed photo from well/parking area, similar to IMG_691 from 2016 report



PL-E03. Photo from well/parking area that captures the drainage going to Pacific Ocean



PL-E04. Photo from west looking east from approximately 75 yards away



PL-E05. Photo from west looking east from approximately 200 ft away, duplicate of IMG_684 from 2006 report



PL-E06. East drainage channel



PL-E07. Slump/scarp area south of cap looking northeast, looks similar to previous years with no new conditions observed



PL-E08. North scarp at west end looking east, depth varies from approximately 2 inches to 2.5 ft



PL-E09. North scarp at approximately mid cap looking east, approximately 2.0 ft exposed



PL-E010. South scarp at west end looking east, covered in vegetation



PL-E011. South scarp at west of centerline looking east, some areas covered in vegetation, exposed areas approximately 6 inches wide and 8 to 12 inches deep



PL-E012. Scarp at west of centerline looking east, extension/additional crack that was previously covered in vegetation, added to previously mapped scarp



PL-E013. East drainage looking north, .5-inch-diameter black cable exposed crossing drainage and partially buried in cap

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Mud Pit Inspection Checklists and Photos
MM4 Stream Crossing

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Photograph Log

Mud Pit Site: MM4 Stream Crossing			
Date	Photo #	Direction of Photo	DESCRIPTION
6/18/2017	MM4_01	Looking E	Washout looking east from approximately 75 ft upstream
6/18/2017	MM4_02	Looking N	Looking north
6/18/2017	MM4_03	Looking W	Looking north
6/18/2017	MM4_04	Looking W	Looking south
6/18/2017	MM4_05	Looking S	Looking west from approximately 75 ft downstream



PL-MM4_01. Washout looking east from approximately 75 ft upstream



PL-MM4_02. Looking north



PL-MM4_03. Looking north



PL-MM4_04. Looking south



PL-MM4_05 Looking west from approximately 75 ft downstream

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Mud Pit Inspection Checklists and Photos
MM18 Road Damage

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Photograph Log

Mud Pit Site: MM18 Road Damage			
Date	Photo #	Direction of Photo	DESCRIPTION
6/17/2017	MM18_01	Looking NW along road	Cracks in road
6/17/2017	MM18_02	Looking NW along road	Diagonal crack furthest south, approximately 60 ft long and up to 4 ft wide and 18 inches deep
6/17/2017	MM18_03	Looking NW along W shoulder of road	Longitudinal crack along west shoulder of road
6/17/2017	MM18_04	Looking NW	Diagonal crack, approximately 40 ft long, up to 1 ft wide and 10 inches deep
6/17/2017	MM18_05	Looking NW	Transverse cracks, three dominant and one minor, at north end of damage area
6/17/2017	MM18_06	Looking E	Transvers cracks at north end of damage area, approximately 21 ft long, 1 ft to 2.5 ft deep, and 2 ft to 4 ft wide



PL-MM18_01. Cracks in road



PL-MM18_02. Diagonal crack furthest south, approximately 60 ft long and up to 4 ft wide and 18 inches deep



PL-MM18_03. Longitudinal crack along west shoulder of the road



PL-MM18_04. Diagonal crack, approximately 40 ft long, up to 1 ft wide and 10" inches deep



PL-MM18_05. Transverse cracks, three dominant and one minor, at north end of damage area



PL-MM18_06. Transverse cracks at north end of damage area, approximately 21 ft long, 1 ft to 2.5 ft deep, and 2 ft to 4 ft wide

Mud Pit Inspection Checklists and Photos
MM5 Road Damage

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Photograph Log

Mud Pit Site: MM5 Road Damage			
Date	Photo #	Direction of Photo	DESCRIPTION
6/18/2017	MM5_01	Looking N	Viewing crack in road standing on south end looking north
6/18/2017	MM5_02	Looking N	Viewing crack in road standing on south end looking north
6/18/2017	MM5_03	Looking N	Viewing crack in road standing on south end looking north
6/18/2017	MM5_04	Looking S	Viewing crack in road standing on north end looking south
6/18/2017	MM5_05	Looking S	Viewing crack in road standing on north end looking south
6/18/2017	MM5_06	Looking N	Drainage channel flow line crossing road (low spot) looking north
6/18/2017	MM5_07	Looking S	Drainage channel flow line crossing road (low spot) looking south

Note:

Actual location is closer to MM 5.6



PL-MM5_01. Viewing crack in road standing on south end looking north



PL-MM5_02. Viewing crack in road standing on south end looking north



PL-MM5_03. Viewing crack in road standing on south end looking north



PL-MM5_04. Viewing crack in road standing on north end looking south



PL-MM5_05. Viewing crack in road standing on north end looking south



PL-MM5_06. Drainage channel flow line crossing road (low spot) looking north



PL-MM5_07. Drainage channel flow line crossing road (low spot) looking south

Mud Pit Inspection Checklists and Photos

MM8 Borrow Pit Area

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Photograph Log

Mud Pit Site: MM8 Borrow Pit Area			
Date	Photo #	Direction of Photo	DESCRIPTION
6/18/2017	MM8 B_01	Looking N, NW	Southwest corner of pond looking north, northwest to main borrow area
6/18/2017	MM8 B_02	Looking W	Southwest corner of pond looking northwest toward south end of existing borrow area
6/18/2017	MM8 B_03	Looking NW	Possible new borrow material southeast corner of new area looking northwest
6/18/2017	MM8 B_04	Looking N,NE	Southwest corner of possible new borrow material area looking north toward the south end of the existing borrow area
6/18/2017	MM8 B_05	Looking S	Northwest corner of possible new borrow material area looking east, southeast
6/18/2017	MM8 B_06	Looking S	Northeast corner of possible new borrow material area looking east



PL-MM8 B_01. Southwest corner of pond looking north, northwest to main borrow area



PL- MM8 B_02. Southwest corner of pond looking north toward south end of existing borrow area



PL-MM8 B_03. Possible new borrow material southeast corner of new area looking northwest



PL-MM8 B_04. Southwest corner of possible new borrow material area looking north, northeast toward the south end of the existing borrow area



PL-MM8 B_05. Northwest corner of possible new borrow material area looking east, southeast



PL-MM8 B_06. Northeast corner of possible new borrow material area looking east