LMS/CNT/S33327

# Postclosure Inspection and Monitoring Report for Surface Corrective Action Unit 417 at the Central Nevada Test Area, Nevada, Site

**February 2021**



U.S. DEPARTMENT OF ENERGY | Legacy Management

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# Abbreviations

| | |
|---|---|
| bgs | below ground surface |
| CAU | Corrective Action Unit |
| CMP | Central Mud Pit |
| CNTA | Central Nevada Test Area |
| DOE | U.S. Department of Energy |
| FFACO | Federal Facility Agreement and Consent Order |
| ft | feet |
| LM | Office of Legacy Management |
| NDEP | Nevada Division of Environmental Protection |
| ROTC | Record of Technical Change |

# Executive Summary

This report documents the biennial postclosure site inspections conducted in August 2020 at the surface Corrective Action Unit (CAU) 417 at the Central Nevada Test Area, Nevada, Site. The UC-1, UC-3, and UC-4 sites are inspected every 2 years in accordance with the Post-Closure Monitoring Plan provided in the 2001 *Closure Report for Corrective Action Unit 417: Central Nevada Test Area Surface, Nevada*, hereafter called the CAU 417 Closure Report. The requirements for postclosure monitoring have been modified over the years through negotiations with the Nevada Division of Environmental Protection (NDEP). Modifications were documented through three separate Records of Technical Change to the CAU 417 Closure Report, which were approved by NDEP in 2003, 2011, and 2015.

The UC-1, UC-3, and UC-4 sites were observed as being in good condition during the 2020 inspections. The exceptions were a gate that was missing from the UC-4 Mud Pit C fenced area and a few maintenance activities that were completed at the UC-1 Central Mud Pit (CMP) and UC-3 site. These maintenance activities included rehanging a sign on the southeast side of the UC-1 CMP fenced area, filling in a few minor cracks on the CMP cover, and repairing a concrete monument at the northeast corner of the UC-3 Mud Pit U3E site. It is planned that the gate to the UC-4 Mud Pit C fenced area will be replaced during the next site visit planned for mid-2021. Otherwise, no significant concerns were noted for the UC-1, UC-3, or UC-4 sites, and no further maintenance or repairs are recommended at this time.

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# 1.0 Introduction

This report presents results of the biennial postclosure site inspection conducted by the U.S. Department of Energy (DOE) Office of Legacy Management (LM) at the Central Nevada Test Area (CNTA), Nevada, Site (Figure 1) surface Corrective Action Unit (CAU) 417. The report has been prepared in accordance with the Post-Closure Monitoring Plan contained in the *Closure Report for Corrective Action Unit 417: Central Nevada Test Area Surface, Nevada* (NNSA/NV 2001), hereafter called the CAU 417 Closure Report. The site closure process was completed in 2001 in accordance with the amended Federal Facility Agreement and Consent Order (FFACO 1996, as amended) (FFACO) and all applicable Nevada Division of Environmental Protection (NDEP) policies and regulations. Responsibility for environmental site restoration was transferred from the DOE National Nuclear Security Administration Nevada Field Office to LM on October 1, 2006. This report summarizes investigation activities associated with CAU 417 that LM conducted from September 2018 through August 2020. A postclosure inspection was conducted in 2020 to document the physical condition of the CAU 417 soil covers, monuments, signs, fencing, and use-restricted areas.

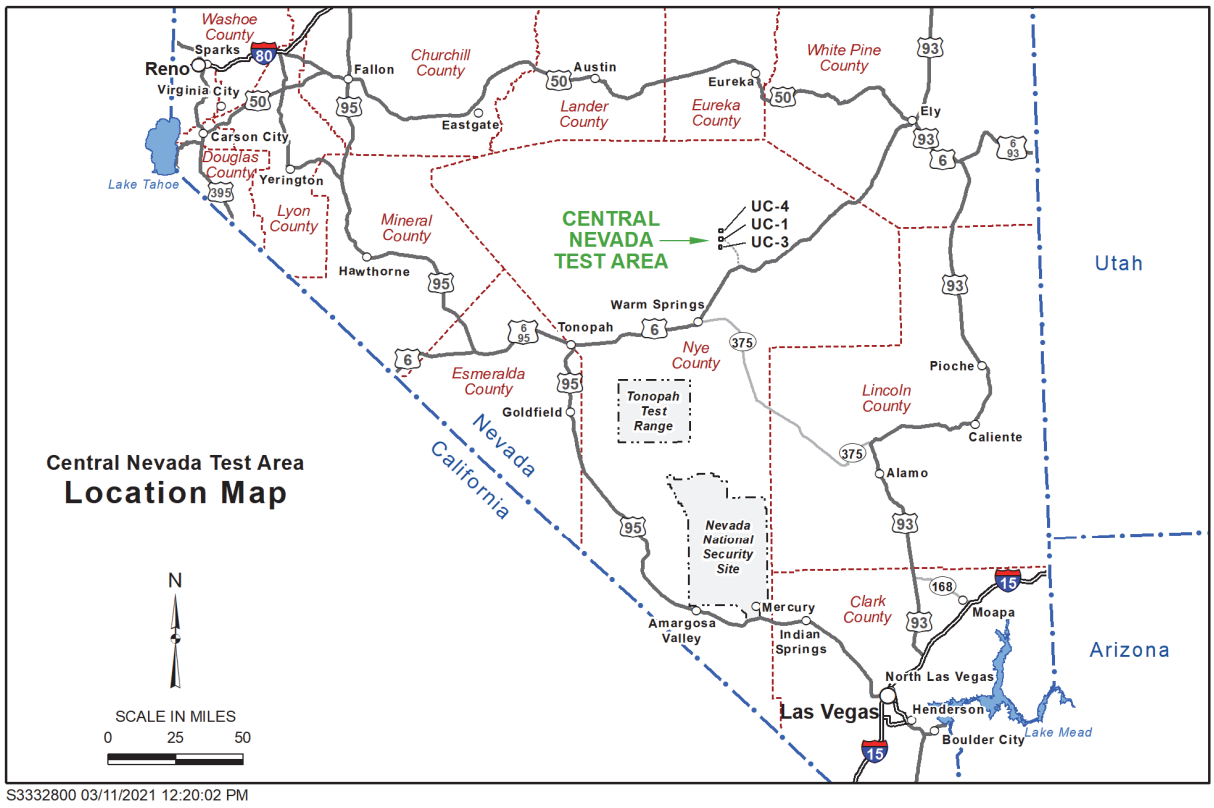


*Figure 1. CNTA Location Map*

## 1.1 Purpose

The purpose of the postclosure inspection at CAU 417 is to evaluate the surface use-restricted areas to determine if:

- The UC-1 Central Mud Pit (CMP) or UC-4 Mud Pit C covers, fences, or diversion channels need maintenance or repairs (Figure 2 and Figure 3).
- Vegetation on the UC-1 CMP cover is healthy.

- The aboveground monuments or warning signs associated with the surface use-restricted areas at UC-1, UC-3, and UC-4 need maintenance or repairs.
- The administrative controls need modifications.

## 1.2 Site Location and Background

The CNTA is approximately 14 miles north of U.S. Highway 6 and approximately 68 miles northeast of Tonopah in Nye County, Nevada (Figure 1). Three boreholes—UC-1, UC-3, and UC-4—were drilled at the CNTA for underground nuclear weapons testing. On January 19, 1968, the Faultless underground nuclear test was conducted in borehole UC-1 at a depth of 3200 feet (ft) (DOE 2015). The other two boreholes (UC-3 and UC-4) were not used, and no further testing was conducted at the CNTA. Boreholes UC-1, UC-3, and UC-4 are on three separate land withdrawals that range in size from approximately 1 to 1.5 square miles (Figure 2). All three land withdrawals are accessible to the public.

## 1.3 Geologic and Hydrogeologic Setting

The underground nuclear test triggered numerous small earthquakes and aftershocks that resulted in surface subsidence and surface rupture along preexisting faults, creating a subsidence graben (also referred to as a down-dropped fault block) at the UC-1 site. The southeast bounding graben fault has a maximum surface displacement of 15 ft and dips beneath the southeastern corner of the UC-1 CMP (see UC-1 site detail in Figure 2). The formation of this fault scarp disrupted normal drainage patterns, so flood diversion channels were constructed (Figure 3) to protect the cover and prevent infiltration along the fault scarp (NNSA/NV 2001).

The depth to groundwater at the UC-1 CMP is approximately 275 ft below ground surface (bgs) based on measurements obtained from well UC-1-P-1SRC[1] prior to and after its recompletion in June 2009 (Figure 2). Water levels measured before the recompletion of UC-1-P-1S had been suspect because difficulties were encountered during the well's drilling and construction in 1968. Historically, the reported depth to water of 550 ft at the CMP was based on measurements obtained from well HTH-2, which is outside the subsidence graben, nearly 1500 ft southwest of the CMP (Figure 2). Well UC-1-P-1SRC is inside the subsidence graben (down-drop fault block), less than 200 ft west of the CMP. The differing depths to groundwater inside and outside the subsidence graben (northwest and southeast of the southeast bounding fault) were confirmed by the 2009 drilling program. Wells MV-4 and MV-5 were drilled through the southeast graben fault and were dual completions with a piezometer inside the graben and a well outside the graben (DOE 2009). The depth to groundwater measured in the piezometers is consistent with that of well UC-1-P-1SRC, approximately 275 ft bgs. The depth to groundwater measured in the wells outside the graben is consistent with that of well HTH-2, approximately 550 ft bgs. Well HTH 1RC (outside the subsidence graben) was also recompleted in 2009 with two piezometers (upper and lower alluvial aquifer) and a well (upper volcanic section). The depth to water of both HTH-1RC piezometers is approximately 550 ft bgs.

[1] "RC" in a well name indicates that the well has been recompleted.

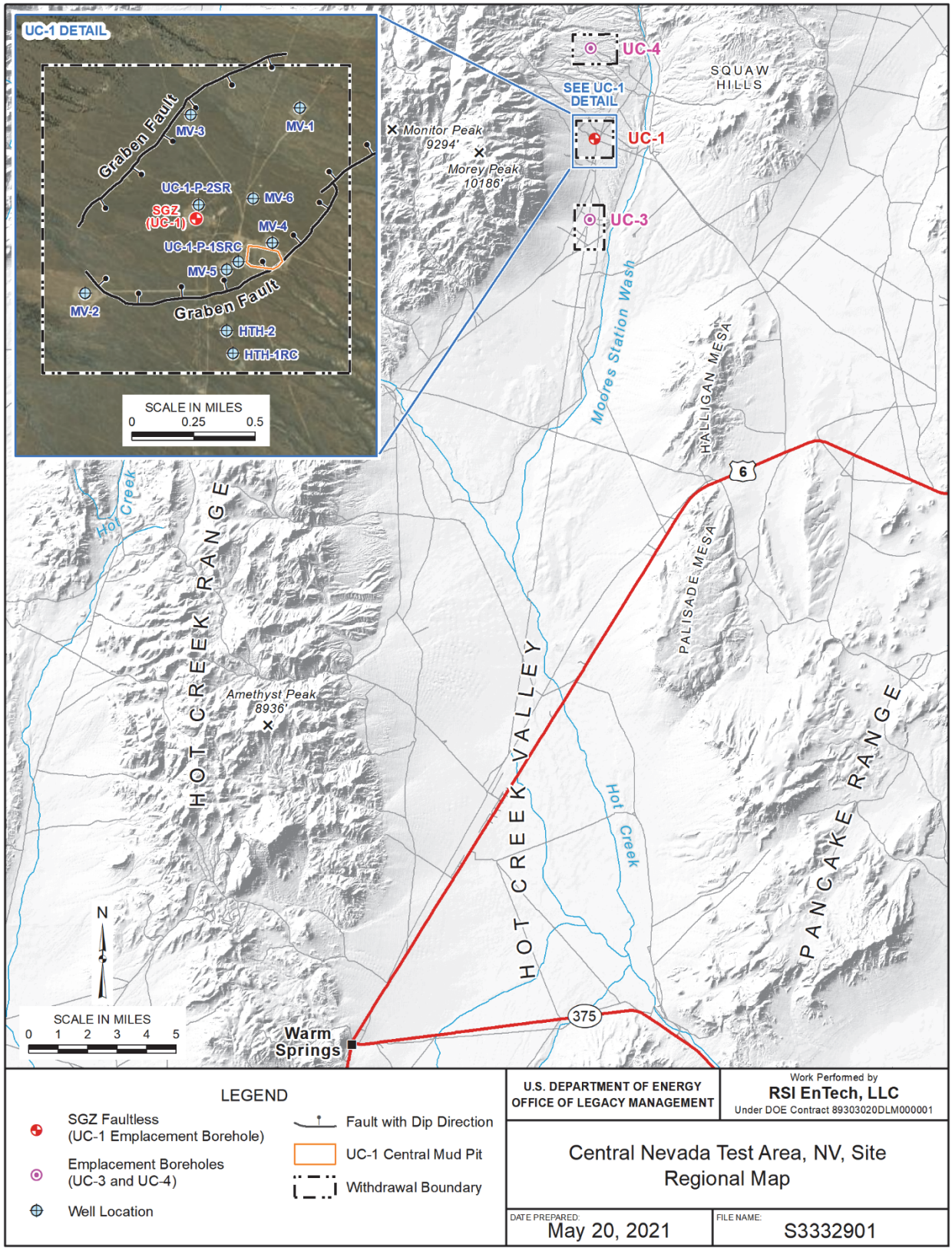


*Figure 2. CNTA Regional Map*

*Figure 3. Surface Use-Restricted Areas, CNTA*

# 2.0 Postclosure Monitoring Requirements

The postclosure monitoring requirements were established in the CAU 417 Closure Report (NNSA/NV 2001). These requirements have been modified over the years through negotiations with NDEP. Modifications were documented through three separate Records of Technical Change (ROTCs) to the CAU 417 Closure Report that were approved by NDEP in 2003, 2011, and 2015. The last ROTC removed the requirements for monitoring of soil moisture and subsidence at the UC-1 CMP cover and subsidence at the UC-4 Mud Pit C. Data supporting the removal of these requirements were presented to NDEP in the *Path Forward for Future Post Closure Inspection and Monitoring of Surface Corrective Action Unit (CAU) 417 at the Central Nevada Test Area, Nevada* (Kautsky 2015), which NDEP approved in a letter of agreement dated March 2015 (Andres 2015). A copy of the 2015 ROTC to the CAU 417 Closure Report is provided as Appendix A.

## 2.1 Site Inspections

Site inspections are conducted biennially at the site. The inspections are documented on an inspection checklist, with site photographs and, if applicable, field notes. The biennial postclosure site inspection consists of the following:

- Inspecting the UC-1 CMP cover and UC-4 Mud Pit C cover and fencing. This includes walking the entire perimeter of the fence and documenting the condition of the barbed-wire and chicken-wire fencing, warning signs, and entrance gate.
- Inspecting all aboveground monuments, attached warning signs, and affixed survey pins placed at the UC-1, UC-3, and UC-4 sites for signs of wear, disturbance, vandalism, and other damage. Damaged monuments and attached signs are repaired during site inspections or, if necessary, later in the calendar year.
- Documenting any changes to the covers or fenced areas, including the presence of trash and debris inside the fenced areas, erosion features on the covers or diversion channels, and any change in the health and stability of the UC-1 CMP cover vegetation.

## 2.2 Maintenance and Repair

If a site inspection detects that either the UC-1 CMP cover or the UC-4 Mud Pit C cover require major repairs, or if any other problems in critical areas are noted, then issues will be evaluated and reported to NDEP within 60 days of detection (in compliance with the FFACO). The following guidelines apply to CAU 417 maintenance and repairs:

- Cracks, settling features, erosion rills, and animal burrows more than 6 inches deep that extend 3 ft or more and do not compromise the UC-1 CMP or UC-4 Mud Pit C covers will be evaluated and repaired within 90 days of detection
- Noncritical cracks, settling features, erosion rills, and animal burrows less than 6 inches deep that extend less than 3 ft will be repaired during the site inspection visit
- Damage to the fencing surrounding the UC-1 CMP cover or the UC-4 Mud Pit C cover, warning signs, or monuments will be evaluated and repaired within 90 days of detection

- Major damage to use-restriction warning signs or monuments will be evaluated and repaired during subsequent site inspections
- Reports from the public of detrimental conditions at the site will be responded to within 90 days

All repair work will preserve the original as-built design and will be documented in the biennial postclosure inspection report.

## 2.3 Reporting Requirements

All inspection and maintenance activities conducted during the biennial monitoring period are documented and included in the biennial postclosure inspection report. The biennial reporting will continue through 2020 in accordance with the 2015 ROTC (Appendix A). LM is in discussions with NDEP to revise the postclosure inspection and reporting frequency, which will be approved and executed through an ROTC to the CAU 417 Closure Report. LM will submit the report to NDEP and include the following information:

- A brief narrative and discussion of all postclosure inspection activities and observations
- Copies of all completed inspection checklists and maintenance records
- Specific recommendations for nonstandard maintenance or changes in postclosure requirements

All closure and postclosure monitoring documentation is maintained in project files and is available upon request.

# 3.0 Site Inspections, Surveys, and Maintenance

The UC-1, UC-3, and UC-4 sites were visited during a subsurface CAU 443 groundwater monitoring event that was completed on June 6, 2019. No issues were identified during the site visits. This section contains the results of the inspections that were done during the biennial monitoring period. It also includes a description of any maintenance that was performed.

## 3.1 Biennial Site Inspection Results

The biennial inspections of the three sites were completed on August 6, 2020. Copies of the inspection checklists and photographs are included in Appendix B. The following sections document the inspection results.

### 3.1.1 UC-1 Inspection

The UC-1 site (Figure 4) was in good condition at the time of the inspection. The locks, fencing, and signs associated with the CMP were in good condition. A sign was rehung on the southeast side of the CMP fenced area because the clasps that secured the sign to the fence had failed, and a few minor cracks on the CMP cover were repaired during the inspection. No issues that affected the integrity of the cover—including cracks, fractures, or extensions of existing cracks and fractures—were noted. The vegetation on the cover continued to look healthy and stable. The stormwater diversion channels designed to divert stormwater runoff around the CMP were observed as being in good condition with no unusual erosion features or breaches in the constructed channels. All signs and monuments at Mud Pits A and E (Figure 4) were in good condition. No additional maintenance or repairs are recommended at this time. Photographs 1 through 5 in Appendix B show the condition of the UC-1 site at the time of the inspection.

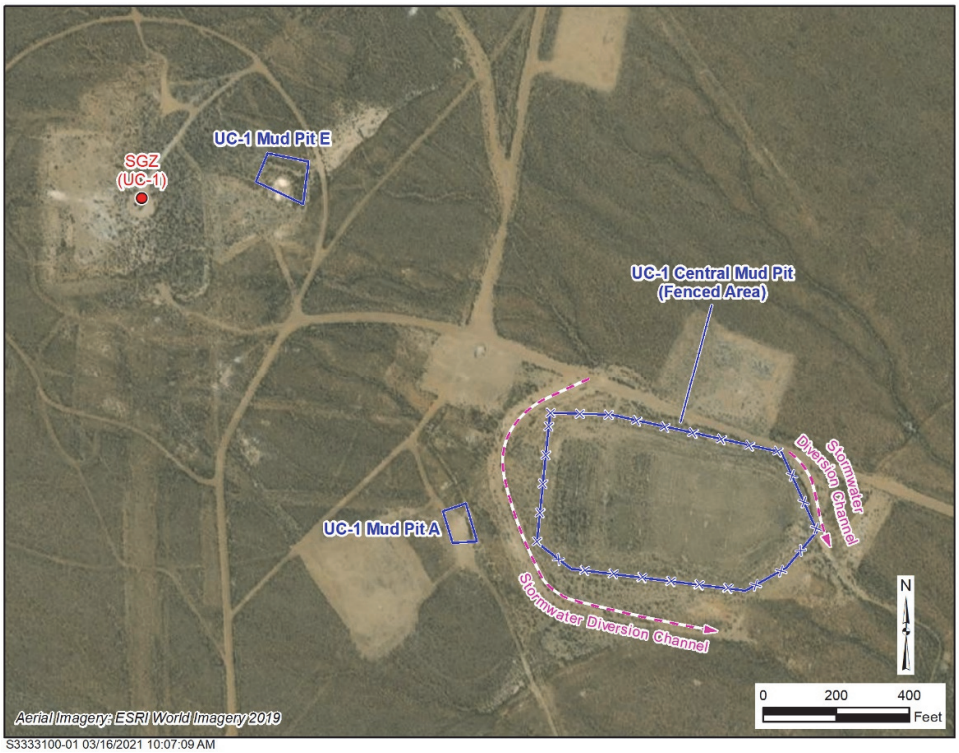


*Figure 4. UC-1 Site Map Showing the Surface Use-Restricted Areas*

### 3.1.2 UC-3 Inspection

The UC-3 site (Figure 5) was in good condition at the time of the inspection. The 2018 inspection revealed damage to the concrete monument at the northeast corner of Mud Pit U3E (DOE 2020); that damage was repaired (Appendix B, photograph 7) during the 2020 inspection with a concrete patch material designed to reduce further deterioration and to protect the survey pin on top of the monument. The survey pin remains in good condition, and the repaired monument continues to function as designed. No other issues with the monuments or signs were identified during the inspection, and no additional maintenance actions or repairs are recommended at this time. Photographs 6 through 8 in Appendix B show the condition of the UC-3 site at the time of the inspection.

### 3.1.3 UC-4 Inspection

At the UC-4 site (Figure 6), a gate was missing from the Mud Pit C fenced area (Appendix B, photograph 11). A replacement gate was not available in Ely at the time of the inspection. The gate will be special ordered so it can be replaced during the next site visit planned for mid-2021. The remainder of the Mud Pit C fence, signs, and monuments were in good condition. No erosion rills were identified on Mud Pit C, and no issues that affected the integrity of the cover, including cracks or fractures, were observed. All signs and monuments at Mud Pits A, B, and D and Area X were in good condition (Figure 6). The gate to the Mud Pit C fenced area will be replaced during the next site visit, but no additional maintenance or repairs are recommended at this time. Photographs 9 through 14 in Appendix B show the condition of the UC-4 site at the time of the inspection.


*Figure 5. UC-3 Site Map, Showing the Surface Use-Restricted Areas*

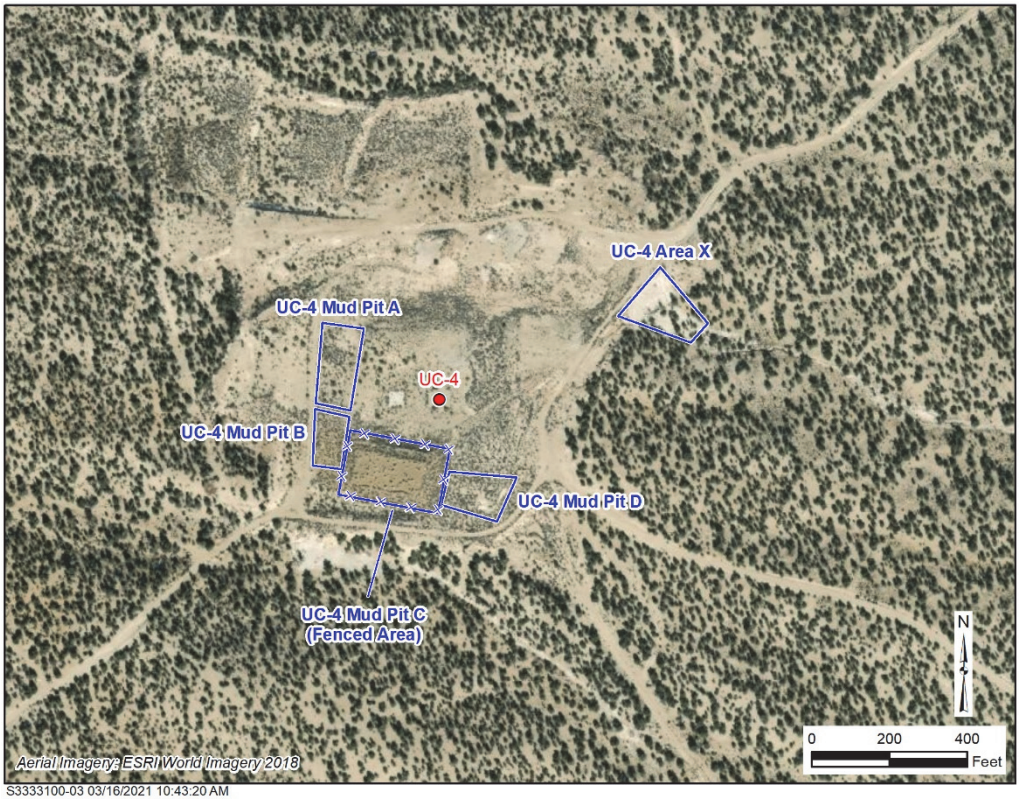


*Figure 6. UC-4 Site Map, Showing the Surface Use-Restricted Areas*

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# 4.0 Summary, Conclusions, and Recommendations

This section contains the summary, conclusions, and recommendations for the biennial monitoring period at CAU 417 at the CNTA.

## 4.1 Summary

The inspection of UC-1 indicated that the site was in good condition. A sign was rehung on the southeast side of the CMP fenced area, and a few minor cracks on the CMP cover were repaired during the inspection. No other cracks, fractures, or extensions of existing cracks and fractures that would affect the integrity of the cover were observed, and no issues with the fence, gate, or monuments were identified. The vegetation on the CMP cover continued to look healthy. No issues were identified, and no additional maintenance or repair activities are recommended at this time.

The inspection of UC-3 indicated that the site was in good condition. Damage to the concrete monument at the northeast corner of Mud Pit U3E (identified during the 2018 inspection) was repaired. The repaired monument continues to function as designed. All other monuments and signs were in good condition. No issues were identified, and no additional maintenance or repair activities are recommended at this time.

The inspection of UC-4 revealed that the gate to the Mud Pit C fenced area was missing, though the remainder of the site was in good condition. No erosion rills, new fractures or extension of existing fractures were observed, and no issues with the fence, monuments, or signs were identified. Replacement of the gate to the Mud Pit C fenced area is planned for the next site visit in mid-2021. No other issues were identified, and no additional maintenance or repair activities are recommended at this time.

## 4.2 Conclusions

The following conclusions are based on the 2020 biennial inspection:

- No significant concerns were noted for the UC-1, UC-3, or UC-4 sites, and only the gate to the Mud Pit C fenced area needs to be replaced. Otherwise, no further maintenance or repairs are recommended at this time.

## 4.3 Recommendations

The following recommendations are based on the 2020 inspection:

- Replace the gate to the Mud Pit C fenced area during the next site visit planned for mid-2021
- Implement an inspection and reporting frequency of every 6 years, with the next inspection report in 2026 with submittal to NDEP in 2027
- Continue to respond within 90 days to any reports from the public about detrimental conditions at the site

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# 5.0 References

Andres, 2015. Christine Andres, chief, Bureau of Federal Facilities, Nevada Division of Environmental Protection, letter of agreement (regarding "Path Forward for Future Post-Closure Inspection and Monitoring of Surface Corrective Action Unit (CAU) 417 at the Central Nevada Test Area, Nevada") to Mark Kautsky, site manager, Office of Legacy Management, March 2.

DOE (U.S. Department of Energy), 2009. *Well Completion Report for Corrective Action Unit 443, Central Nevada Test Area, Nye County, Nevada*, LMS/CNT/S05827, Office of Legacy Management, Grand Junction, Colorado, December.

DOE (U.S. Department of Energy), 2015. *United States Nuclear Tests, July 1945 through September 1992*, DOE/NV-209, Rev. 16, National Nuclear Security Administration, Nevada Field Office, September.

DOE (U.S. Department of Energy), 2020. *Postclosure Inspection and Monitoring Report for Surface Corrective Action Unit 417 at the Central Nevada Test Area, Nevada, Site*, LMS/CNT/S24796, Office of Legacy Management, Grand Junction, Colorado, February.

FFACO (Federal Facility Agreement and Consent Order), 1996 (as amended). Agreed to by the State of Nevada, the U.S. Department of Energy, and the U.S. Department of Defense.

Kautsky, 2015. Mark Kautsky, site manager, Office of Legacy Management, letter ("Path Forward for Future Post-Closure Inspection and Monitoring of Surface Corrective Action Unit (CAU) 417 at the Central Nevada Test Area, Nevada") to Christine Andres, chief, Bureau of Federal Facilities, Nevada Division of Environmental Protection, February 25.

NNSA/NV (U.S. Department of Energy, National Nuclear Security Administration Nevada Operations Office), 2001. *Closure Report for Corrective Action Unit 417: Central Nevada Test Area Surface, Nevada*, DOE/NV-743, Rev. 1, November.

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# Appendix A

# Record of Technical Change, 2015

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National Nuclear Security Administration

**Department of Energy**
National Nuclear Security Administration
Nevada Field Office
P.O. Box 98518
Las Vegas, NV 89193-8518

JUN 2 2015

Christine Andres, Chief
Bureau of Federal Facilities
Division of Environmental Protection
2030 East Flamingo Road, Suite 230
Las Vegas, NV 89119-0818

SUBMITTAL OF THE RECORD OF TECHNICAL CHANGE (ROTC) NUMBER DOE/NV--743 ROTC 3 FOR THE FINAL CLOSURE REPORT, REVISION 1, FOR CORRECTIVE ACTION UNIT 417: CENTRAL NEVADA TEST AREA – SURFACE, NEVADA, NOVEMBER 2001

Enclosed for your records is one uncontrolled copy of the Record of Technical Change DOE/NV—743 ROTC 3 for the subject document.

Please direct comments and questions to Mark Kautsky, Office of Legacy Management, at (970) 248-6018.

Robert F. Boehlecke, Manager
Environmental Management Operations

EMO:11306.CD

Enclosures:
As stated

cc w/o encl. via e-mail:
Mark McLane, NDEP
Mark Kautsky, DOE/LM
J. T. Fraher, DTRA/CXTS
FFACO Group, NFO
NFO Read File

# RECORD OF TECHNICAL CHANGE

Technical Change No. DOE/NV--743 ROTC 3 Page 1 of 1

Activity Name Central Nevada Test Area – ROTC for CAU 417 Closure Report Date April 29, 2015

The following technical changes (including justification) are requested by:

Mark Kautsky (Name)

Site Manager, Department of Energy/Office of Legacy Management (Title)

Description of Change:

Page 50, Section 5.1.3, The following sentences shall be added to the end of the first paragraph: As per the February 2015 Path Forward letter (dated February 25, 2015), the following was decided:

- Remove requirements for continued monitoring of soil moisture and subsidence from the UC-1 CMP and UC-4 Mud Pit. (The fences and engineered soil covers provide additional controls that prevent any inadvertent intrusions to the underlying drilling mud; these engineering controls will remain in place.)
- Continue visual inspections at all the sites and provide photographs of selected sites to document the health and stability of the vegetation at the UC-1 CMP cover.
- Prepare a brief report every 2 years to document the inspections. This requirement is in accordance with ROTC DOE/NV—743 ROTC 2 dated March 23, 2011, that changed the reporting schedule to every other year for the next 10 years, starting in 2010 (first report in 2012) and ending in 2020.

Justification:

The change was made in mutual agreement with NDEP and is based on soil moisture data from the UC-1 Central Mud Pit and subsidence data from the UC-1 Central Mud Pit and UC-4 Mud Pit collected over the past 14 years.

The task time will be unchanged.

Applicable Activity-Specific Document(s):

Closure Report for Corrective Action Unit 417: Central Nevada Test Area, Surface, Nevada, Revision: 1

Approved By: Mark Kautsky DOE-LM Site Manager Date 5-13-2015

Mark McKone NDEP Date 5-18-2015

# Appendix B

# Inspection Checklists and Site Photographs, 2020

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## CAU 417: CNTA UC-1 CENTRAL MUD PIT COVER, POST-CLOSURE INSPECTION CHECKLIST

| | |
|---|---|
| Date of Last Inspection: June 27, 2018 | Reason for Last Inspection: Scheduled Biennial Inspection |
| Responsible Agency: DOE-LM | Project Manager: Rick Findlay |
| Inspection Date: August 6, 2020 | |
| Inspector (name, title, organization): Rick Findlay, Project Manager, Navarro | |
| Assistant Inspector (name, title, organization): Rex Hodges, Hydrogeologist, Navarro | |

**A. GENERAL INSTRUCTIONS**

1. 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. Attach the additional pages and number all 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 purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, may take the form of sketches, measurements, 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.
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.
6. This unit will be inspected every two years with formal reporting to the Nevada Division of Environmental Protection to be done within a reasonable amount of time after completion of the inspection. The report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

| B. **PREPARATION** (To be completed prior to site visit) | YES | NO | EXPLANATION |
|---|---|---|---|
| 1. Site as-built plans and site base map reviewed. | X | | |
| 2. Previous inspection reports reviewed. | X | | |
| a. Were anomalies or trends detected on previous inspections? | | X | |
| b. Was maintenance performed? | | X | |
| 3. Site maintenance and repair records reviewed. | X | | |
| a. Has site repair resulted in a change from as-built conditions? | | X | |
| b. Are revised as-builts available that reflect repair changes? | | X | No maintenance was performed in 2018, so no revisions were necessary. |

| C. **SITE INSPECTION** (To be completed during inspection) | YES | NO | EXPLANATION |
|---|---|---|---|
| 1. Adjacent off-site features within watershed areas. | | | |
| a. Have there been any changes in use of adjacent area? | | X | |
| b. Are there any new roads or trails? | | X | |
| c. Has there been a change in the position of nearby washes? | | X | |
| d. Has there been lateral excursion or erosion/deposition of nearby washes? | | X | |
| e. Are there new drainage channels? | | X | |
| f. Are there any erosion features within the diversion channels? (Photo document the diversion channels) | | X | |
| g. Change in surrounding vegetation? | | X | |
| 2. Security fence, signs. | | | |
| a. Displacement of fences, site markers, boundary markers, or monuments? | | X | |
| b. Have any signs been damaged or removed? (Number of signs replaced: 1) | X | | One sign at the southeast end of the CMP fence was rehung during the 2020 inspection. |
| c. Were gates locked? | X | | |

## CAU 417: CNTA UC-1 CENTRAL MUD PIT COVER, POST-CLOSURE MONITORING CHECKLIST

| 3. Waste Unit cover. | YES | NO | EXPLANATION |
|---|---|---|---|
| a. Is there evidence of settling? | X | | Minor cracks on the cover were repaired |
| b. Is there cracking? | X | | Minor cracks on the cover were repaired |
| c. Is there evidence of erosion around the cap (wind or water)? | | X | |
| d. Is there evidence of animal burrowing? | | X | |
| e. Have the site markers been disturbed by man or natural processes? | | X | |
| f. Do natural processes threaten the integrity of any cover or site marker? | | X | |
| g. Other? | | X | No issues were identified. |
| 4. Vegetative cover. | | | |
| a. Is perimeter fence or mesh fencing damaged? | | X | |
| b. Is there evidence of horses or rabbits on site? | | X | |
| c. Is organic mulch and/or plants adequate to prevent erosion? | X | | |
| d. Are weedy annual plants present? If yes, are they a problem? | | X | |
| e. Are seeded plant species found on site? | X | | |
| f. Is there evidence of plant mortality? | | X | |
| 5. Photo Documentation | | | |
| a. Has a photo log been prepared? | X | | |
| c. Number of photos exposed (48 digital photographs) | | | |

| D. FIELD CONCLUSIONS | | | |
|---|---|---|---|
| 1. Is there an imminent hazard to the integrity of the unit? (Immediate report required) | | X | |
| Person/Agency to whom report made: | | | |
| 2. Are more frequent inspections required? | | X | |
| 3. Are existing maintenance/repair actions satisfactory? | X | | |
| 4. Is other maintenance/repair necessary? | | X | |
| 5. Is current status/condition of vegetative cover satisfactory? | X | | |

6. Rationale for field conclusions: A sign was rehung at the southeast end of the CMP fence and only minor cracks were observed in the CMP cover that were repaired during the 2020 inspection. The remainder of the site was observed as being in good condition during the inspection.

**E. CERTIFICATION**

I have conducted an inspection of the UC-1 Central Mud Pit Cover, CAU 417, at the Central Nevada Test Area in accordance with the Post-Closure Monitoring Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photologs, and photographs.

| Chief Inspector's Signature: Rick C. Findlay 2021.03.15 09:10:48 -06'00' | Printed Name: Rick Findlay |
|---|---|
| Title: Project Manager | Date: |

## CAU 417: CNTA UC-3, POST-CLOSURE INSPECTION CHECKLIST

| | |
|---|---|
| Date of Last Inspection: June 26, 2018 | Reason for Last Inspection: Scheduled Biennial Inspection |
| Responsible Agency: DOE-LM | Project Manager: Rick Findlay |
| Inspection Date: August 6, 2020 | |
| Inspector (name, title, organization): Rick Findlay, Project Manager, Navarro | |
| Assistant Inspector (name, title, organization): Rex Hodges, Hydrogeologist, Navarro | |

**A. GENERAL INSTRUCTIONS**

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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.
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.
6. This unit will be inspected every two years with formal reporting to the Nevada Division of Environmental Protection to be done within a reasonable amount of time after completion of the inspection. The report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

| **B. PREPARATION** (To be completed prior to site visit) | YES | NO | EXPLANATION |
|---|---|---|---|
| 1. Site as-built plans and site base map reviewed. | X | | |
| 2. Previous inspection reports reviewed. | X | | |
| a. Were anomalies or trends detected on previous inspections? | | X | |
| b. Was maintenance performed? | | X | No maintenance was conducted during the 2018 inspection, but damage to a concrete boundary monument at the northeast corner of Mud Pit U3E was identified, see last inspection report for details. |
| 3. Site maintenance and repair records reviewed. | X | | |
| a. Has site repair resulted in a change from as-built conditions? | | X | |
| b. Are revised as-builts available that reflect repair changes? | | X | No maintenance was performed in 2018, so no revisions were necessary. |

| **C. SITE INSPECTION** (To be completed during inspection) | YES | NO | EXPLANATION |
|---|---|---|---|
| 1. Adjacent off-site features within watershed areas. | | | |
| a. Have there been any changes in use of adjacent area? | | X | |
| b. Are there any new roads or trails? | | X | |
| c. Has there been a change in the position of nearby washes? | | X | |
| d. Has there been lateral excursion or erosion/deposition of nearby washes? | | X | |
| e. Are there new drainage channels? | | X | |
| f. Change in surrounding vegetation? | | X | |
| 2. Security fence, signs. | | | |
| a. Displacement of fences, site markers, boundary markers, or monuments? | | X | No displacements were observed, but the top of the concrete boundary marker at the northeast corner of Mud Pit U3E was repaired. |
| b. Have any signs been damaged or removed? (Number of signs replaced: 0) | | X | |
| c. Were gates locked? | | | Not Applicable – No gate at the site. |

## CAU 417: CNTA UC-3, POST-CLOSURE INSPECTION CHECKLIST

| D. FIELD CONCLUSIONS | YES | NO | EXPLANATION |
|---|---|---|---|
| 1. Is there an imminent hazard to the integrity of the unit? (Immediate report required) | | X | |
| Person/Agency to whom report made: | | | |
| 2. Are more frequent inspections required? | | X | |
| 3. Are existing maintenance/repair actions satisfactory? | X | | |
| 4. Is other maintenance/repair necessary? | | X | |
| 5. Is current status/condition of unit satisfactory? | X | | |

6. Rationale for field conclusions: The concrete monument at the northeast corner of Mud Pit U3E was identified as being damaged during the 2018 inspection. The damage was minor and the concrete monument and survey pin at the top of the monument still functioned as designed. This monument was repaired during the 2020 inspection to reduce any further deterioration. No other maintenance actions were identified during the inspection, and the site was in good condition at the time of the inspection.

**E. CERTIFICATION**

I have conducted an inspection of UC-3, CAU 417, at the Central Nevada Test Area in accordance with the Post-Closure Monitoring Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

| | |
|---|---|
| Chief Inspector's Signature: Rick C. Findlay 2021.03.15 09:12:43 -06'00' | Printed Name: Rick Findlay |
| Title: Project Manager | Date: |

## CAU 417: CNTA UC-4 MUD PIT C COVER, POST-CLOSURE INSPECTION CHECKLIST

| | |
|---|---|
| Date of Last Inspection: June 26, 2018 | Reason for Last Inspection: Scheduled Biennial Inspection |
| Responsible Agency: DOE-LM | Project Manager: Rick Findlay |
| Inspection Date: August 6, 2020 | |
| Inspector (name, title, organization): Rick Findlay, Project Manager, Navarro | |
| Assistant Inspector (name, title, organization): Rex Hodges, Hydrogeologist, Navarro | |

**A. GENERAL INSTRUCTIONS**

1. 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. Attach the additional pages and number all 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 purpose of this requirement is to provide a written explanation of inspector observations and the inspector's rationale for conclusions and recommendations. Explanations are to be placed on additional attachments and cross-referenced appropriately. Explanations, in addition to narrative, will take the form of sketches, measurements, 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.
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.
6. This unit will be inspected every two years with formal reporting to the Nevada Division of Environmental Protection to be done within a reasonable amount of time after completion of the inspection. The report will include an executive summary, this inspection checklist with field notes and photo log attached, and recommendations and conclusions.

| **B. PREPARATION** (To be completed prior to site visit) | YES | NO | EXPLANATION |
|---|---|---|---|
| 1. Site as-built plans and site base map reviewed. | X | | |
| 2. Previous inspection reports reviewed. | X | | |
| a. Were anomalies or trends detected on previous inspections? | | X | |
| b. Was maintenance performed? | | X | |
| 3. Site maintenance and repair records reviewed. | X | | |
| a. Has site repair resulted in a change from as-built conditions? | | X | |
| b. Are revised as-builts available that reflect repair changes? | | X | No maintenance was performed in 2018, so no revisions were necessary. |

| **C. SITE INSPECTION** (To be completed during inspection) | YES | NO | EXPLANATION |
|---|---|---|---|
| 1. Adjacent off-site features within watershed areas. | | | |
| a. Have there been any changes in use of adjacent area? | | X | |
| b. Are there any new roads or trails? | | X | |
| c. Has there been a change in the position of nearby washes? | | X | |
| d. Has there been lateral excursion or erosion/deposition of nearby washes? | | X | |
| e. Are there new drainage channels? | | X | |
| f. Change in surrounding vegetation? | | X | |
| 2. Security fence, signs. | | | |
| a. Displacement of fences, site markers, boundary markers, or monuments? | | X | |
| b. Have any signs been damaged or removed? (Number of signs replaced: 0) | | X | |
| c. Were gates locked? | | X | The UC-4 Mud Pit C gate was missing at the time of the inspection. |

## CAU 417: CNTA UC-4 MUD PIT C COVER, POST-CLOSURE INSPECTION CHECKLIST

| 3. Waste Unit cover. | YES | NO | EXPLANATION |
|---|---|---|---|
| a. Is there evidence of settling? | | X | |
| b. Is there cracking? | | X | |
| c. Is there evidence of erosion around the cap (wind or water)? | | X | |
| d. Is there evidence of animal burrowing? | | X | |
| e. Have the site markers been disturbed by man or natural processes? | | X | |
| f. Is there vegetation on the cover? | X | | Yes, vegetation has been allowed to spread across the entire cap/cover to limit erosion. See site photographs for details. |
| g. Do natural processes threaten to integrity of any cover or site marker? | | X | |
| h. Other? | | X | |
| 4. Photo Documentation | | | |
| a. Has a photo log been prepared? | X | | |
| c. Number of photos exposed (46 digital photos) | | | |

### D. FIELD CONCLUSIONS

| | | | |
|---|---|---|---|
| 1. Is there an imminent hazard to the integrity of the unit? (Immediate report required) | | X | |
| Person/Agency to whom report made: | | | |
| 2. Are more frequent inspections required? | | X | |
| 3. Are existing maintenance/repair actions satisfactory? | X | | |
| 4. Is other maintenance/repair necessary? | | X | |
| 5. Is current status/condition of vegetative cover satisfactory? | X | | |

6. Rationale for field conclusions: The gate to the UC-4 Mud Pit C was missing at the time of the inspection, but the remainder of the site was in good condition – no erosion rills were observed, the fence is in good condition, and no signs were down.

### E. CERTIFICATION

I have conducted an inspection of the UC-4 Mud Pit C Cover, CAU 417, at the Central Nevada Test Area in accordance with the Post-Closure Inspection Plan (see Closure Report) as recorded on this checklist, attached sheets, field notes, photo logs, and photographs.

| | |
|---|---|
| Chief Inspector's Signature: Rick C. Findlay 2021.03.15 09:15:25 -06'00' | Printed Name: Rick Findlay |
| Title: Project Manager | Date: |


*Photograph 1. UC-1 CMP (view from entrance gate on north fence line, looking southeast)*

*Photograph 2. UC-1 CMP (view from southeast end of CMP, looking west)*


*Photograph 3. UC-1 Mud Pit E (view from southwest monument, looking east)*


*Photograph 4. UC-1 East Stormwater Diversion Channel (view from site access road, looking south)*

*Photograph 5. UC-1 West Stormwater Diversion Channel (view from site access road, looking southwest)*

*Photograph 6. UC-3 Area E Spill Outlier (view from northeast monument, looking southwest)*

*Photograph 7. UC-3 Mud Pit U3E, Showing Repairs Made to the Top of the Monument (view from northeast monument, looking south)*

*Photograph 8. UC-3 Shaker Pad Area U3S (view from northwest monument, looking south)*


*Photograph 9. UC-4 Area X (view from southwest monument, looking northeast)*


*Photograph 10. UC-4 Mud Pit D (view from southeast monument, looking northwest)*


*Photograph 11. UC-4 Mud Pit C (view of entrance to fenced area with missing gate, looking northeast)*

*Photograph 12. UC-4 Mud Pit C (view from southeast corner of mud pit cover, looking west)*


*Photograph 13. UC-4 Mud Pit B (view from southwest monument, looking northeast)*


*Photograph 14. UC-4 Mud Pit A (view from southwest monument, looking north)*

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# Appendix C

# NDEP Correspondence and Record of Review

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NEVADA DIVISION OF
ENVIRONMENTAL
PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Steve Sisolak, Governor
Bradley Crowell, Director
Greg Lovato, Administrator

October 18, 2021

Meghann Hurt
Site Manager
U. S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

RE: Submittal of Draft Post-Closure Inspection and Monitoring Report, *Surface Corrective Action Unit 417, Central Nevada Test Area, Nevada, Site Federal Facility Agreement and Consent Order (FFACO)*

Dear Ms. Hurt,

The Nevada Division of Environmental Protection, Bureau of Federal Facilities (NDEP) has received and reviewed the *Draft Post-Closure Inspection and Monitoring Report, Surface Corrective Action Unit 417, Central Nevada Test Area* (CNTA), *Nevada, Site* (Report). The Report documents the post-closure inspection and monitoring activities that the Office of Legacy Management (LM) conducted from September 2018 through August 2020 at the CNTA. The report was received on September 20, 2021. This letter does serve as a Notice of Completion for the September 23, 2021, Milestone Deadline for submission of this Report. However, while the Report was prepared in accordance with the Post-Closure Monitoring Plan contained in the Closure Report for Corrective Action Unit 417, the NDEP does have the following comments, which should be addressed in the Final Report:

1. Page 1, Section 1.0, Fifth Sentence: It is stated that this report summarizes investigation activities associated with CAU 417 that LM conducted from September 2018 through August 2020, but the only post-closure inspection noted in the report was conducted on August 6, 2020. Please clarify if other inspections or site visits occurred between September 2018 and August 2020 as no other ones are described in the Report. If there were additional inspections conducted, they should be included, or the language clarified in this sentence.

2. Page 6, Section 2.3, First Paragraph, First Sentence: This sentence states, "All inspection and maintenance activities conducted during the biennial monitoring period are documented and included in the biennial postclosure inspection report." This statement ties to the question implied in No. 1, above. The only inspection described in this Report is the one conducted in August 2020. Please explain or correct this discrepancy.

3. Page 7, Section 3.1.1, First Paragraph, Third Sentence: Please state the reason a sign needed to be rehung on the southeast side of the CMP fenced area. Also, were new cracks,

fractures, or extensions of existing cracks and fractures actually noted on the cover but the size of them precluded affecting the integrity of the cover or was nothing new actually observed as seems to be stated in Section 4.1, First Paragraph, Third Sentence.

4. Page 11, Section 4.3, Recommendations: The NDEP concurs with the Recommendations proposed by LM. However, in regard to the Second Bullet, NDEP requests that all site visits/inspections conducted during any six-year period be documented in the Inspection Report covering that six-year timeframe.

5. Page B-1, UC-1 Inspection Checklist, Section C.1.f: While the answer to this question states that there were no erosion features observed within the diversion channels, there are no photos documenting the diversion channels. Please explain in Section 3.1.1 what was observed during the inspection of the stormwater diversion channels and why no photos are included in Appendix B.

Please address any questions regarding this matter to Nikita Lingenfelter at (702) 668-3924 or me at (702) 668-3911.

Sincerely,

Christine D. Andres
Chief
Bureau of Federal Facilities

ec: Nikita Lingenfelter, NDEP
FFACO Group, NFO
EM Records, Las Vegas, NV
Navarro Central Files
Robert Boehlecke, EM, Las Vegas
Jenny Chapman, DRI
Jeffery Fraher, DTRA/CXTS
MSTS Correspondence Management
Jalena Dayvault, DOE/LM
Ken Kreie, DOE/LM
Rick Findlay, RSI
Jackie Petrello, RSI

# Record of Review

Review requirements are described in the *Document Management Services, Resources, and Procedures* (LMS/PRO/S32818). Reviewers may document any review with this form. This form should not be converted to a PDF until all reviews are complete.

## Document Information

Due date[1]: 03/01/2022 Review number: 1 Project: Central Nevada Test Area (CNTA) Charge code: LMCP.LMCP.2. Enter text

Document title, number, and revision: Postclosure Inspection and Monitoring Report for Surface Corrective Action Unit 417, Central Nevada Test Area, Nevada, Site

Author: Meghann Hurt Author's phone: (970) 248-6034 Author's organization: DOE - LM

Reviewer: Christine Andres - NDEP Reviewer's phone: (702) 486-2850 ext 232 Reviewer's organization: NDEP

Reviewer's recommendation: ☐ Release without comment ☐ Consider comments ☒ Resolve comments and reroute for review Date[2]: 10/18/2021

Author's response: ☒ Comments have been addressed Date[2]: 10/29/2021

Reviewer's response to comment resolution: ☒ Satisfactory ☐ Unsatisfactory[3] Signature: Christine Andres Date[2]: Date 2/4/22

Author signifies all comments resolved successfully: Enter text All comments satisfactorily resolved Date: Date

[1] Failure to respond to the review request will be considered approval of issuing the document as written.
[2] Reviewer or author signature not required. Authorization implied by completing date field and submittal of review.
[3] If the author or reviewer is dissatisfied with the resolution, the matter may be elevated to the next level of management. If an impasse develops, management must resolve the issue.

| Item Number | Reviewer's Comments and Recommendations | Required | Author's Response (if required) |
|---|---|---|---|
| 1 | Page 1, Section 1.0, Fifth Sentence: It is stated that this report summarizes investigation activities associated with CAU 417 that LM conducted from September 2018 through August 2020, but the only post-closure inspection noted in the report was conducted on August 6, 2020. Please clarify if other inspections or site visits occurred between September 2018 and August 2020 as no other ones are described in the Report. If there were additional inspections conducted, they should be included, or the language clarified in this sentence. | Yes | The post-closure site inspection and reporting frequency was changed to every other year or biennially in 2012 (ROTC-2) and reaffirmed in 2015 (ROTC-3). Subsequently, only one site inspection (August 2020) was conducted during this two-year reporting period. The UC-1, UC-3, and UC-4 sites are also visited during the annual CAU 443 groundwater monitoring events, which in 2019, took place on June 6. Site visits are conducted for general visualization purposes and are not completed to the same standard as a typical biennial site inspection, which includes completion of the site inspection checklists and extensive photographic documentation. In the future, site visits will be noted in Section 3.0, while the site inspections will remain the focus of Sections 3.1 through 3.1.3 in the Inspection Report for CAU 417. |

## Record of Review

| Item Number | Reviewer's Comments and Recommendations | Required | Author's Response (if required) |
|---|---|---|---|
| 2 | Page 6, Section 2.3, First Paragraph, First Sentence: This sentence states, "All inspection and maintenance activities conducted during the biennial monitoring period are documented and included in the biennial postclosure inspection report." This statement ties to the question implied in No. 1, above. The only inspection described in this Report is the one conducted in August 2020. Please explain or correct this discrepancy. | Yes | As stated above, only one post-closure site inspection was conducted during this two-year reporting period as prescribed by ROTC-2 and ROTC-3. Site visits were conducted on June 6, 2019, but they were only site visits and were not completed as biennial site inspections. There were no issues identified during the site visits. These site visits are now noted in Section 3.0 to resolve the discrepancy. The biennial site inspections will remain the focus of Sections 3.1 through 3.1.3 in the Inspection Report for CAU 417. |
| 3 | Page 7, Section 3.1.1, First Paragraph, Third Sentence: Please state the reason a sign needed to be rehung on the southeast side of the CMP fenced area. Also, were new cracks, fractures, or extensions of existing cracks and fractures actually noted on the cover but the size of them precluded affecting the integrity of the cover or was nothing new actually observed as seems to be stated in Section 4.1, First Paragraph, Third Sentence. | Yes | The sign at the southeast side of the CMP fenced area needed to be rehung because the clasps that secured the sign to the fence had failed. The third sentence in the first paragraph of Section 3.1.1 was revised to include this information.<br><br>While new cracks were observed on the CMP cover, it was determined that they were minor (based on size) and would not affect the integrity of the cover. The fourth sentence in the first paragraph of Section 3.1.1 and the third sentence in the first paragraph of Section 4.1 were revised to provide clarification (removal of the word 'new' as there is also a reference to 'existing'). |
| 4 | Page 11, Section 4.3, Recommendations: The NDEP concurs with the Recommendations proposed by LM. However, in regard to the Second Bullet, NDEP requests that all site visits/inspections conducted during any six-year period be documented in the Inspection Report covering that six-year timeframe. | Yes | Section 3.0 of this report has been revised to include the June 2019 site visit, and if these revisions are acceptable to NDEP, LM will similarly document site visits completed during the next reporting period (2021 through 2026 and every six years thereafter). |
| 5 | Page B-1, UC-1 Inspection Checklist, Section C.1.f: While the answer to this question states that there were no erosion features observed within the diversion channels, there are no photos documenting the diversion channels. Please explain in Section 3.1.1 what was observed during the inspection of the stormwater diversion channels and why no photos are included in Appendix B. | Yes | Section 3.1.1 was revised to document the condition of the stormwater diversion channels and two photographs (now photographs 4 and 5) of the diversion channels were added to Appendix B. |
| Item number | Enter comment | Select | Enter response |