U.S. DEPARTMENT OF ENERGY

PNNL-20678

Prepared for the U.S. Department of Energy
under Contract DE-AC05-76RL01830

Cultural Resources Monitoring for the Rattlesnake Mountain Combined Community Communications Facility and Infrastructure Cleanup on the Fitzner/Eberhardt Arid Lands Ecology Reserve, 600 Area, Hanford Site, Washington – HCRC# 2008-600-004

ES White
SS Hughes

September 2011

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CULTURAL RESOURCES REPORT COVER SHEET

Author: Eric White and Susan Hughes

Title of Report: Cultural Resources Monitoring for the Rattlesnake Mountain Combined Community Communications Facility and Infrastructure Cleanup on the Fitzner/Eberhardt Arid Lands Ecology Reserve, 600 Area, Hanford Site, Washington – HCRC# 2008-600-004

Date of Report: September 2011

County(ies): Benton

Sections 3,4,5,9,10 of Township 10 N, Range 26 E
Sections 30,31,32,34,35 of Township 11 N, Range 26 E
Section 20 of Township 12 N, Range 26 E

Quad: USGS Iowa Flats (7.5' series); USGS Riverland (7.5' series)
Acres: 0

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Export Files submitted? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☒ Yes ☐ No

TCP(s) found? ☒ Yes ☐ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

DAHP Archaeological Site #:
45BN1678

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Summary

Since 1989, cleaning up the Hanford Site has been the primary mission of the U.S. Department of Energy Richland Operations Office (DOE-RL). One cleanup goal is footprint reduction on the Fitzner/Eberhardt Arid Lands Ecology Reserve (ALE). Footprint reduction includes a variety of activities such as the remediation of waste sites, demolition of abandoned buildings and infrastructure, and removal of equipment and miscellaneous debris items. Footprint reduction on the Rattlesnake Mountain ridgeline also included the construction of the Combined Community Communications Facility (CCCF), which combines all communication towers on Rattlesnake Mountain into a single facility. The proposed footprint reduction activities on ALE were covered in several previously completed cultural resources reviews. Two project areas are especially sensitive to cultural resources—the Rattlesnake Mountain ridgeline, a traditional cultural property (TCP), and Rattlesnake Spring, where several National Register-eligible sites are located.

The first cultural resource review for this project found that footprint reduction activities would have an adverse effect on *Laliik*, the Rattlesnake Mountain TCP, by compromising its spiritual qualities and its visual and natural setting. Through consultation among representatives of DOE, the State Historic Preservation Office, and local tribal groups, a number of mitigation strategies were developed to resolve the adverse effects. These strategies focused on minimizing impacts during the construction and operation of the new CCCF and during demolition and cleanup activities. These stipulations were cemented in a Memorandum of Agreement (MOA), signed by the project stakeholders on July 30, 2009. The MOA required intermittent monitoring by qualified archaeologists during construction of the new communications facility and during demolition and removal of debris and infrastructure.

Archaeologists with Pacific Northwest National Laboratory performed archaeological monitoring intermittently from August 12, 2009, through May 5, 2011. This report documents all archaeological monitoring conducted for the ALE footprint reduction project in accordance with stipulations outlined in the MOA.

Most potential adverse effects to the *Laliik* TCP were likely to occur on the Rattlesnake Mountain ridgeline or in the vicinity of Rattlesnake Spring, and most archaeological monitoring took place at these locations. A few incidents of off-road driving occurred at archaeological sites within the TCP. However, most of the work was consistent with the stipulations outlined in the MOA. The lessons learned from this project suggest that archaeological monitoring of projects on the Hanford Site is warranted. Monitoring was responsible for preventing much of the off-road driving that could have occurred. With archaeological monitors onsite, the work crews performed admirably. Due to the sensitive manner in which project leaders and field staff performed their work, adverse effects to *Laliik* were minimized and no adverse effects occurred to other cultural resources. A previously unidentified archaeological site (45BN1678) was recorded during the project. This site lay beyond the area of project activity and was avoided.

Abbreviations and Acronyms

AIRFA	*American Indian Religious Freedom Act of 1978*
ALE	Fitzner/Eberhardt Arid Lands Ecology Reserve
CCCF	Combined Community Communications Facility
CHPRC	CH2M HILL Plateau Remediation Company
DAHP	Department of Archaeology and Historic Preservation
DOE-RL	U.S. Department of Energy Richland Operations Office
HCRC	Hanford Cultural Resources Case
MOA	Memorandum of Agreement
PNNL	Pacific Northwest National Laboratory
SHPO	State Historic Preservation Office
TCP	traditional cultural property

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1.0 Introduction

Since 1989, the primary mission of the U.S. Department of Energy Richland Operations Office (DOE-RL) has been to clean up the Hanford Site. One cleanup goal is footprint reduction on the Fitzner/Eberhardt Arid Lands Ecology Reserve (ALE). Footprint reduction includes a variety of activities such as the remediation of waste sites, demolition of abandoned buildings and infrastructure, and removal of equipment and miscellaneous debris items (DOE-RL 2010). Footprint reduction on ALE also includes the consolidation of all communications towers on the Rattlesnake Mountain ridgeline into a single new structure, the Combined Community Communications Facility (CCCF). This new facility combines emergency communications capabilities for local, regional, state, and federal emergency service and commercial organizations.

1.1 Background

Cultural resources reviews for this project were completed under Hanford Cultural Resources Case (HCRC) numbers as follows:

- HCRC# 2008-600-004 (Kennedy et al. 2009)
- HCRC# 2008-600-004A (McFarland and Dage 2010)
- HCRC# 2008-600-004C (McFarland and Prendergast-Kennedy 2010)
- HCRC# 2008-600-004D (Hughes et al. 2010)
- HCRC# 2008-600-004E (Sharpe et al. 2010).

The reviews identified two areas as being especially sensitive to impacts—Rattlesnake Mountain, which comprises the *Laliik* traditional cultural property (TCP), and Rattlesnake Spring, an area within the TCP with a number of pre-contact sites eligible for listing on the National Register of Historic Places. Kennedy et al. (2009) found that footprint reduction activities would have an adverse effect on *Laliik* by altering its spiritual qualities and its visual and natural setting.

Through a series of meetings among representatives of DOE-RL, the State Historic Preservation Office (SHPO), and local tribal groups (the Confederated Tribes and Bands of the Yakama Nation, Nez Perce Tribe, Confederated Tribes of the Umatilla Indian Reservation, and the Wanapum), a number of mitigation strategies were developed to resolve the adverse effects. The strategies focused on minimizing adverse effects during construction and operation of the CCCF and during demolition and cleanup activities. The stipulations associated with the strategies were cemented in a Memorandum of Agreement (MOA) that was signed by the above stakeholders on July 30, 2009.[1] The stipulations outlined in the MOA are reproduced in the following paragraphs.

[1] *Memorandum of Agreement (MOA) for the Rattlesnake Mountain Combined Community Communication Facility and Infrastructure Cleanup on the Fitzner/Eberhardt Arid Lands Ecology Reserve Hanford Site, Richland, Washington Between the U.S. Department of Energy and the Washington State Historic Preservation Office, and Invited Signatory Parties: The Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Umatilla Indian Reservation, the Nez Perce Tribe, and the Wanapum*. July 30, 2009. U.S. Department of Energy Richland Operations Office, Richland, Washington.

A. Minimize Adverse Effects During Construction of the CCCF

1. DOE will require the building to be designed to minimize visual, audible and environmental impacts.
2. DOE will require appropriate dust control measures.
3. Consistent with its responsibilities under AIRFA [the *American Indian Religious Freedom Act*], Executive Order 13007, and its government-to-government relationship with the Tribes, DOE will provide continued access and coordinate operation activities to avoid unnecessary interference with Tribal ceremonial activities and religious use of the portion of *Laliik* under DOE's jurisdiction where not inconsistent with the law or essential agency functions.
4. DOE will require that all project activities and vehicle access including laydown and staging areas be confined to paved, graveled, and disturbed areas, to the extent feasible.
5. DOE will provide an initial seven-calendar-day advanced notice in accordance with the agreed to notification matrix to Tribes prior to commencement of project construction activities. DOE will also share work plans and schedules to the Tribes in a timely manner.
6. DOE will provide cultural resource sensitivity awareness training (e.g., training schedule) for all contractors that perform construction activities.
7. DOE will use an appropriately qualified cultural resources specialist to conduct intermittent construction monitoring of project activities.
8. DOE will work with cultural resources personnel to create temporary physical barriers for archaeological sites and culturally sensitive plants located on the ridgeline. Culturally sensitive plants identified will be addressed on a case by case basis. If historical resources cannot be avoided, additional consultation with Tribal staff will be conducted to mitigate for any adverse effects.
9. DOE's cultural resources program will conduct annual cultural resources monitoring of historical resources located near the project area.

B. Minimize Adverse Effects During Operations of CCCF

1. Consistent with its responsibilities under AIRFA, Executive Order 13007, and its government-to-government relationship with the Tribes, DOE will provide continued access and coordinate operation activities to avoid unnecessary interference with Tribal ceremonial activities and religious use of the portion of *Laliik* under DOE's jurisdiction where not inconsistent with the law or essential agency functions.
2. DOE will require the licensee on ALE to periodically evaluate technologies that may become available and would allow relocation of communications and provide continued emergency management of communications and response capabilities.
3. DOE will require that all project activities and vehicle access including laydown and staging areas be confined to paved, graveled, and disturbed areas, to the extent feasible.
4. DOE will provide cultural resources sensitivity awareness training for all contractors that perform ongoing operation and maintenance activities.
5. DOE will use an appropriately qualified cultural resources specialist to conduct intermittent construction monitoring of project activities.
6. DOE's cultural resources program will conduct annual cultural resources monitoring of historical/archaeological sites located near the project area.

C. Minimize Adverse Effects During Demolition Activities

1. DOE will require appropriate dust control measures.
2. Consistent with its responsibilities under AIRFA, Executive Order 13007, and its government-to-government relationship with the Tribes, DOE will provide continued access and coordinate operation activities to avoid unnecessary interference with Tribal ceremonial activities and religious use of the portion of *Laliik* under DOE's jurisdiction where not inconsistent with the law or essential agency functions.
3. DOE will require that all project activities and vehicle access, including laydown and staging areas be confined to paved, graveled, and disturbed areas, to the extent feasible.
4. DOE will provide cultural resources sensitivity awareness training for all contractors that perform demolition activities.
5. DOE will provide an initial seven-calendar-day advanced notice in accordance with the agreed to notification matrix to Tribes prior to commencement of project construction activities.
6. DOE will work with cultural resources personnel to create temporary physical barriers for historical/archaeological sites and culturally sensitive plants located on the ridgeline. Culturally sensitive plants identified will be addressed on a case by case basis. If historical/archaeological resources cannot be avoided, additional consultation with Tribes will be conducted to mitigate for any adverse effects.
7. DOE will develop and implement site-specific recontouring and native plant revegetation strategies using guidance from the Hanford Site Biological Resources Management Plan and in consultation with Tribes.
8. DOE will use an appropriately qualified cultural resources specialist to conduct intermittent construction monitoring of project activities
9. DOE's cultural resources program will conduct annual cultural resources monitoring of historical/archaeological sites located near the project areas.

DOE-RL initiated cleanup activities on ALE in August 2009. As stipulated in the MOA, demolition and removal activities on *Laliik* were monitored by personnel who met U.S. Secretary of the Interior standards for professional archaeologists. By May 2011, the last component of footprint reduction was completed with the removal of power poles and lines on both the Rattlesnake Mountain ridgeline (Upper ALE) and the lower elevations (Lower ALE). Tribes were notified in advance of monitoring activities to allow their participation throughout the process.

1.2 Report Scope

This report documents the archaeological monitoring for footprint reduction activities on ALE. The methods used by the monitors are described in Section 2. The next five major sections document the five separate monitoring projects. Monitoring of construction of the CCCF complex on the ridgeline of Rattlesnake Mountain is covered in Section 3. Section 4 provides descriptions of monitoring done for miscellaneous demolition projects on Upper and Lower ALE and decommissioning of a shed and well at Rattlesnake Spring. Road paving activities were also monitored; these are documented in Section 5. Monitoring conducted during removal of miscellaneous debris on Upper ALE is described in Section 6. Monitoring of power pole removal on both Lower and Upper ALE is described in Section 7. An

archaeological site found outside the area of impact during the power pole removal on the Rattlesnake Mountain ridgeline is described in Section 8. Conclusions drawn from the overall monitoring effort are presented in Section 9, followed by a listing of publicly available references cited in the text (Section 10). The Appendix provides the archaeological site inventory form for a newly identified and recorded archaeological site (45BN1678).

2.0 Methods

Monitoring activities for the footprint reduction project were conducted in the areas depicted on the maps in Figures 1 through 3. Table 1 provides a summary of the monitoring activities conducted between August 2009 and May 2011. All Pacific Northwest National Laboratory (PNNL) cultural resources staff who monitored activities for this project met the U.S. Secretary of the Interior standards for archaeologists. As stipulated in the MOA, cultural resources sensitivity training was provided during onsite safety or pre-job meetings prior to the scheduled construction, demolition, and paving work. The archaeological monitor was present during construction, demolition, and removal activities to ensure that project personnel remained on preexisting roads or disturbed areas to the extent feasible, avoided sensitive areas and archaeological sites, and conducted their work in a way that was considerate and respectful of the traditional cultural property.

The PNNL Geographic Information System database was used to generate maps and aerial photographs for this report, and a 2008 Trimble GeoExplorer Global Positioning System unit was used to record any cultural resources identified during the project. Project activities were photographed, and photographic descriptions were recorded in an electronic PNNL Cultural Resources Project photographic folder. All photographs are on file in the DOE-RL Tribal Affairs and Cultural Resources Project archives housed at Mission Support Alliance. No artifacts were collected during these activities.

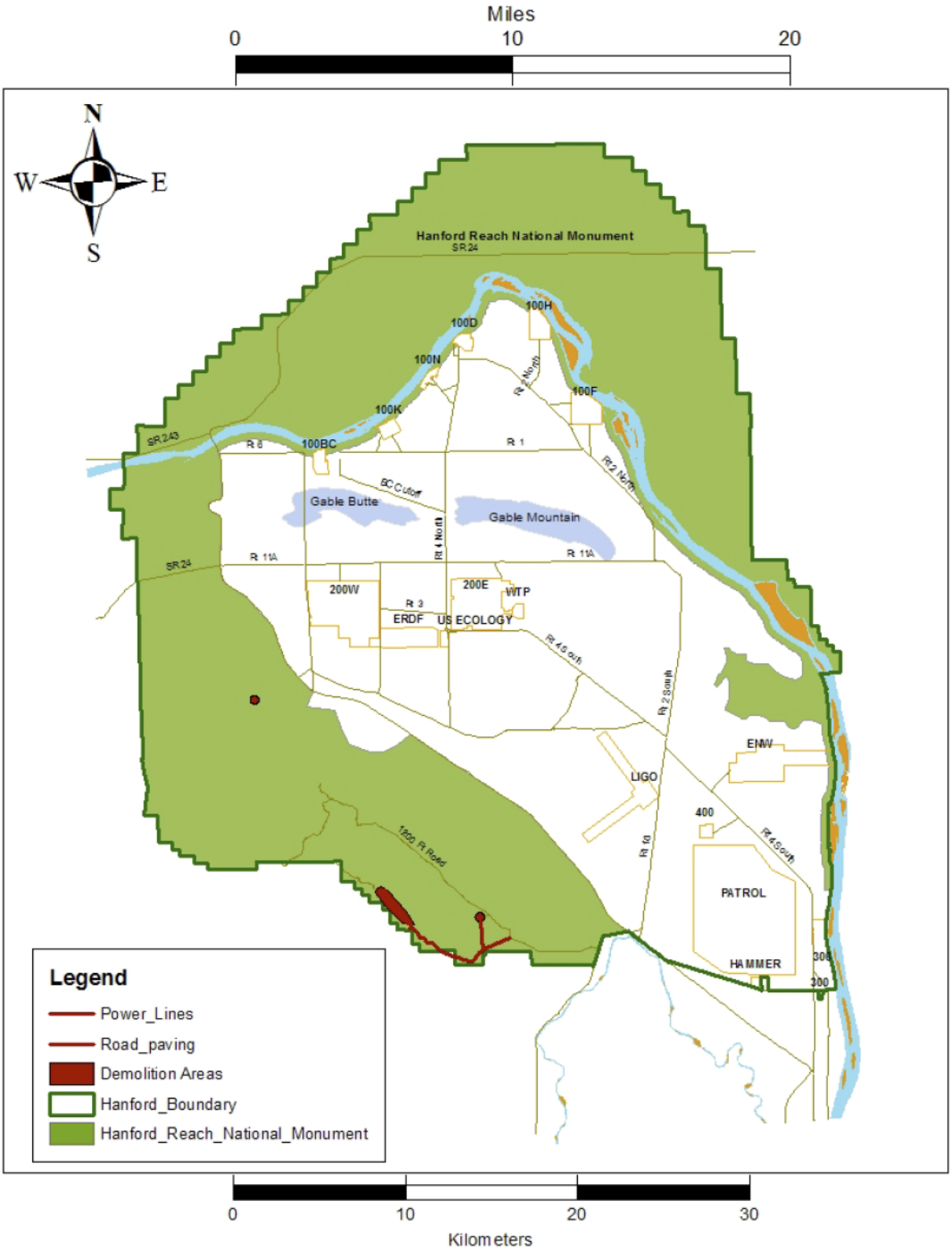

Figure 1. Rattlesnake Mountain and Rattlesnake Spring locations in relation to the Hanford Site.

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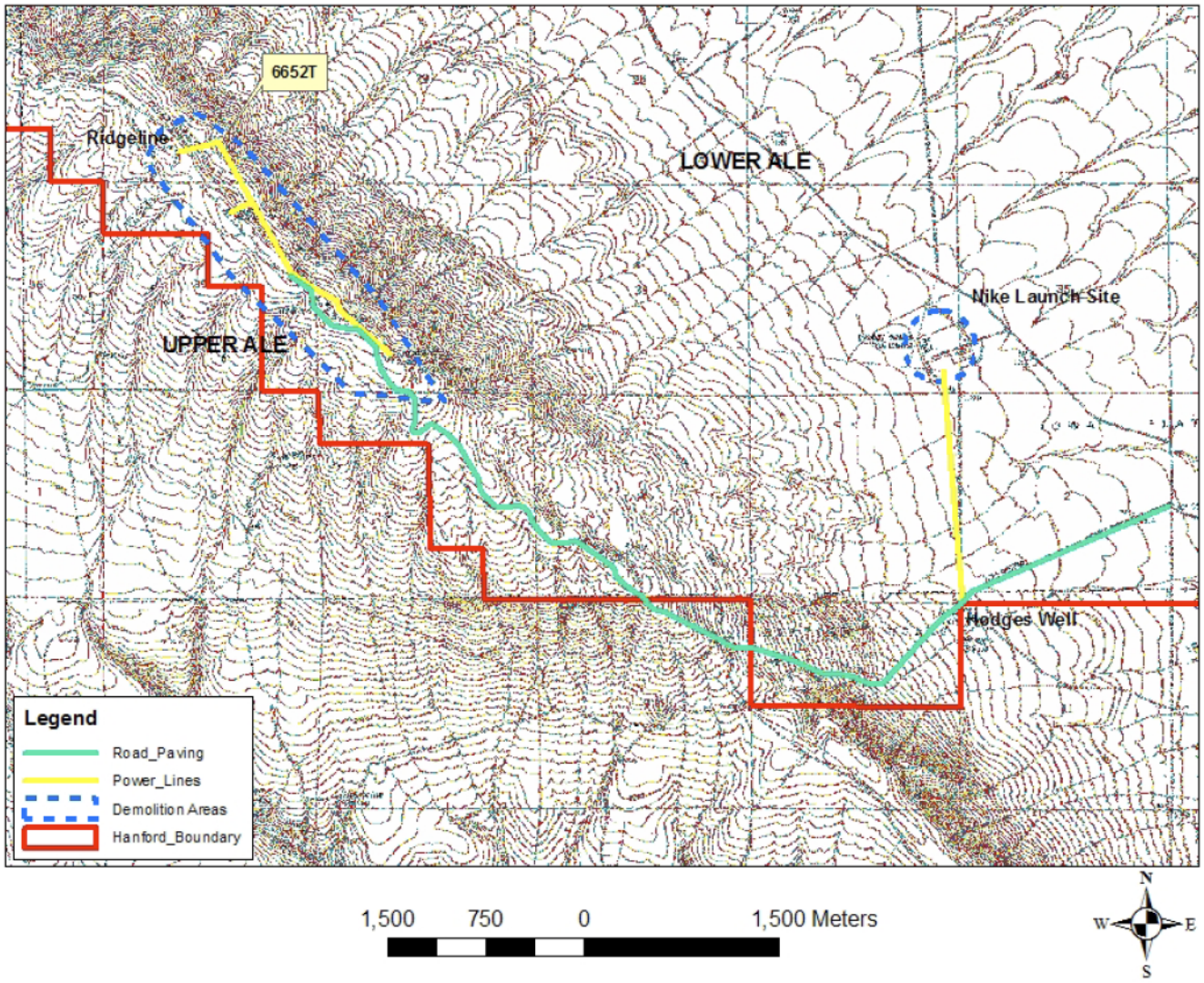

Figure 2. 2009 topographical map of the footprint reduction project areas on Rattlesnake Mountain.

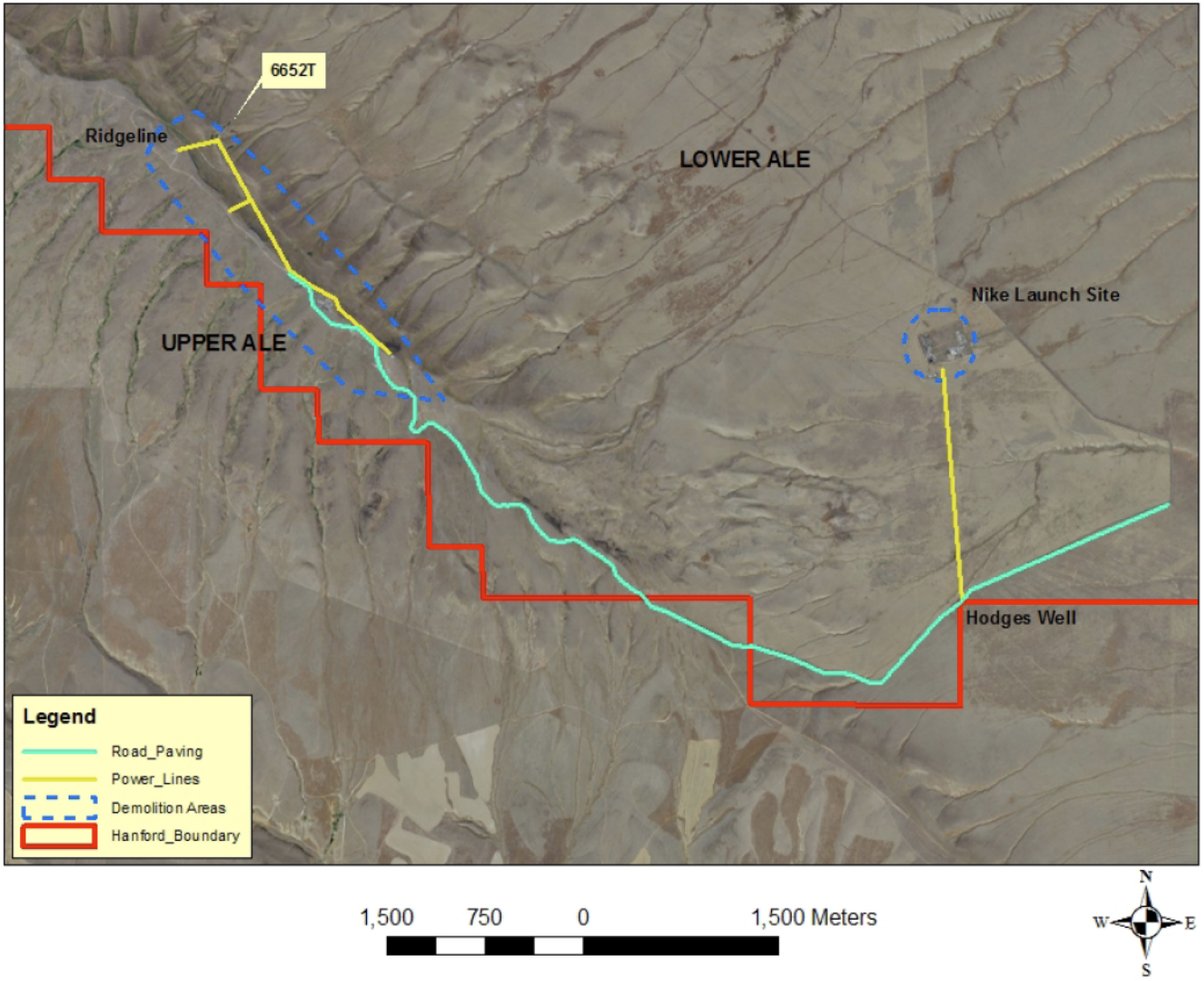

Figure 3. Aerial view of the footprint reduction project locations on Rattlesnake Mountain.

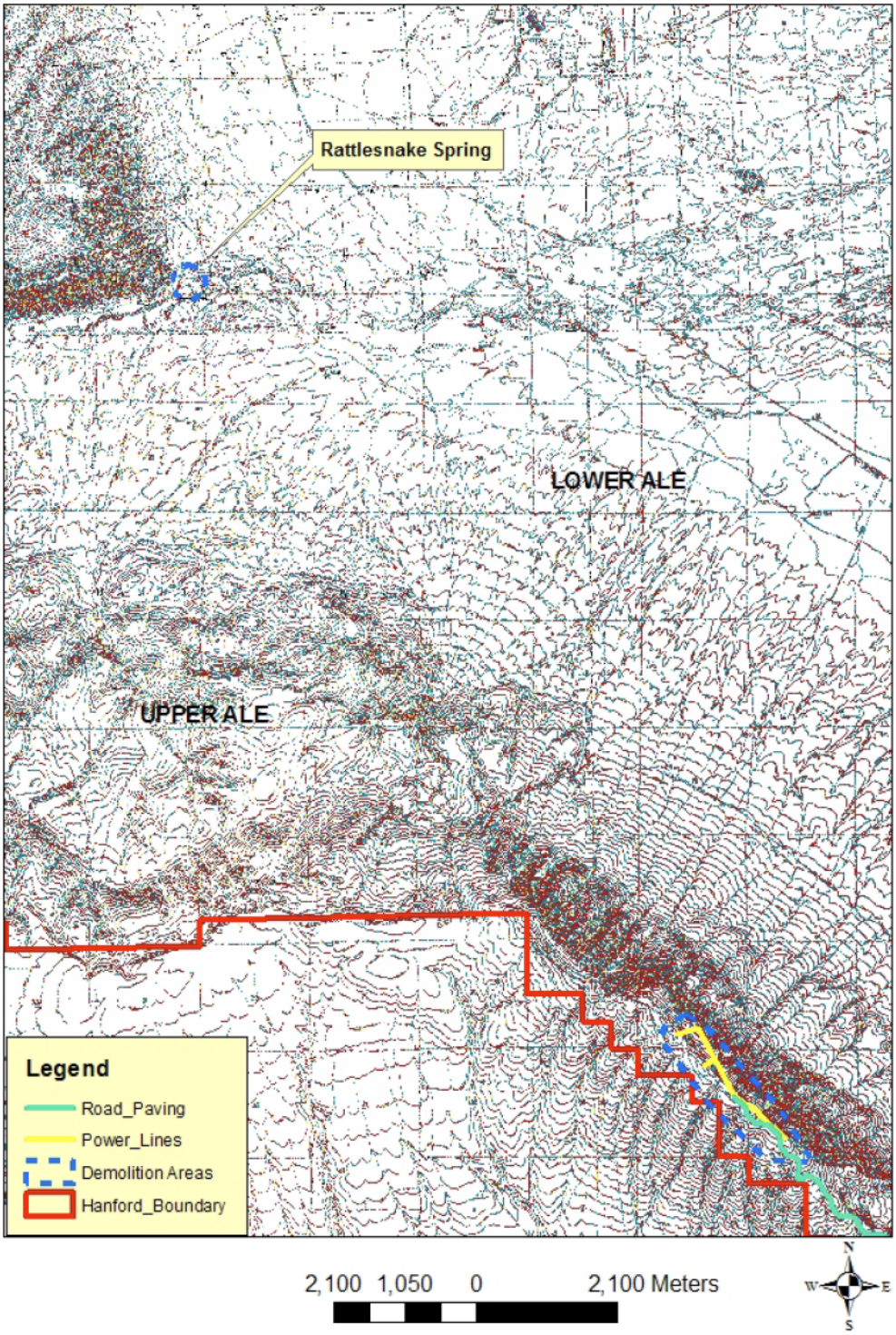

Figure 4. 2009 topographical map of the footprint reduction project areas on Rattlesnake Mountain and at Rattlesnake Spring.

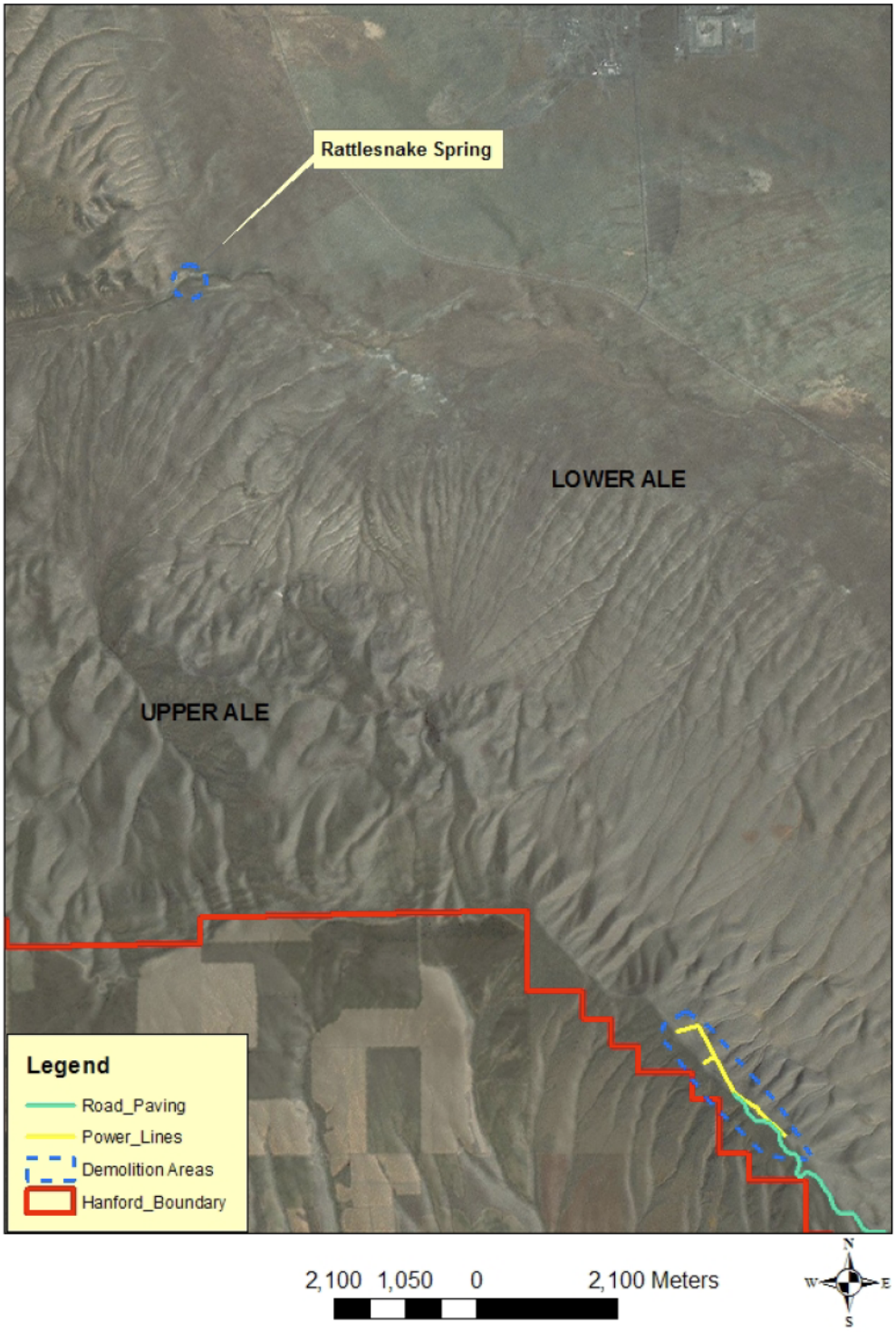

Figure 5. Aerial view of the footprint reduction project areas on Rattlesnake Mountain and at Rattlesnake Spring.

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Table 1. Dates, types, and locations of monitoring activities for the footprint reduction project.

Date of Monitoring	Type of Activity	Location	Adjacent Sites	Cultural Resources Identified
08/12/2009	Construction of CCCF and tower	Rattlesnake Mountain ridgeline	No	No
09/21/2009	Crane arrives to begin building CCCF tower	Rattlesnake Mountain ridgeline	No	No
09/23/2010	Construction of CCCF tower	Rattlesnake Mountain ridgeline	No	No
11/30/2010	Demolition	Observatory foundation and slab, Rattlesnake Mountain ridgeline	No	No
12/03/2010	Demolition	Observatory foundation and slab, Rattlesnake Mountain ridgeline	No	No
01/18/2010	Demolition	Nike facility guard shack, Lower ALE	No	No
03/15–17/2010	Demolition	646 Field Lab, Rattlesnake Spring	45BN170/171;45BN826;45BN1605	No
04/20/2010	Removal of Nike antenna system	Near Nike missile site on Lower ALE	No	No
04/21/2010	Removal of miscellaneous debris	Near Nike missile site on Lower ALE	No	No
04/28–30/2010	Paving	Road to top of Rattlesnake Mountain	45BN1610	No
05/05–06/2010	Demolition of two sheds	6652-C Space Science Building, Rattlesnake Mountain ridgeline	45BN426, 45BN636, HI-90-013	No
05/07/2010	Paving	Road to top of Rattlesnake Mountain	45BN1610	No
05/12/2010	Demolition	6652-T Lower Pump House (building only), Rattlesnake Mountain ridgeline	45BN175	No
05/20/2010	Paving	Road to top of Rattlesnake Mountain	45BN1610	No
05/28/2010	Pre-demolition; identify tower laydown locations	Decommissioned towers on Rattlesnake Mountain ridgeline	45BN1392	No
05/28/2010	Demolition	6652-C Space Science Building, Rattlesnake Mountain ridgeline	45BN426, 45BN636, HI-90-013	No
06/22/2010	Demolition	6652-T Building slab removal, Rattlesnake Mountain ridgeline	45BN175	No
07/26/2010	Well decommissioning	646 Field Lab, Rattlesnake Spring	45BN170/171;45BN826;45BN1605	No
08/17/2010	Well decommissioning	646 Field Lab, Rattlesnake Spring	45BN170/171;45BN826;45BN1605	No

Table 1. contd.

Date of Monitoring	Type of Activity	Location	Adjacent Sites	Cultural Resources Identified
09/24/2010	Demolition	Amateur radio tower, Rattlesnake Mountain ridgeline	No	No
10/22/2010	Power pole removal	646 Field Lab, Rattlesnake Spring	45BN	No
03/05/2011	Power pole removal	Hodges Well, Lower ALE	No	No
03/06/2011	Power pole removal	Rattlesnake Mountain ridgeline	No	No
04/01–03/2011	Power pole removal	Rattlesnake Mountain ridgeline	45BN426;45BN636	No
04/12–13/2011	Power pole removal	Rattlesnake Mountain ridgeline	45BN426;45BN636	No
04/16–17/2011	Power pole removal	Rattlesnake Mountain ridgeline	45BN175;45BN634	45BN1678
04/26/2011	Removal of communications wire	Rattlesnake Mountain ridgeline	No	No
04/28/2011	Removal of communications wire	Rattlesnake Mountain ridgeline	No	No
05/05/2011	Removal of poles/communications wire	Rattlesnake Mountain ridgeline	No	No
05/24/2011	Record 45BN1678	Rattlesnake Mountain ridgeline	N/A	N/A

3.0 Combined Community Communications Facility Construction

Monitoring for the CCCF construction was conducted in support of Stipulation A.7 in the MOA.

On August 12, 2009, a PNNL archaeologist began monitoring CCCF construction work on the Rattlesnake Mountain ridgeline (Figures 6 and 7).

A crane arrived at the construction site on September 21 to begin building the new 180-foot tower. On September 23, monitoring continued for the construction of the CCCF tower on top of Rattlesnake Mountain. The road on top of the mountain was blocked just past the old observatory with the two cranes that were engaged in erecting two towers.

Figure 6. Excavations around the old tower slab at the CCCF site (azimuth northwest).

Figure 7. Construction of the new facility was well underway at this stage (left foreground). The old tower is visible in the background (azimuth northwest).

Figure 8 shows the 120-foot-high tower in the foreground with 60 feet yet to be added to the structure. The tower was erected in 20-foot sections and should withstand 150-mile per hour winds. Each section has a 700-pound brace that had to be attached separately (it could not be flown in with the tower section). Tower construction began in September 2009 and continued into October 2009. Windy conditions on Rattlesnake Mountain caused periodic delays in completing the tower.

Figure 8. Two cranes worked to erect the new CCCF tower (azimuth north).

4.0 Demolition and Decommissioning

Monitoring for ALE footprint reduction demolition and decommissioning activities was conducted in support of Stipulation C.8 of the MOA.

4.1 Upper ALE

On November 30, 2009, PNNL cultural resources staff began monitoring the demolition of the observatory foundation and slab on the top of Rattlesnake Mountain.

A trackhoe with a jackhammer attachment was used to remove the concrete structures (Figure 9). A hydraulic line began leaking on the trackhoe tracks, and demolition activities were suspended for several days pending the arrival of another trackhoe. On December 3, a replacement trackhoe was brought on site. Demolition activities resumed, and the slab was removed completely (Figure 10). Fill material was brought in from a Rattlesnake Mountain location, and the void left by the foundation and slab was completely filled.

Figure 9. A trackhoe with a jackhammer attachment removed the Rattlesnake Mountain observatory foundation and slab (azimuth west).

Figure 10. The trackhoe bucket (upper right) filtered concrete rubble from the ground (azimuth west).

In early May, two sheds near the 6652-C Space Sciences Laboratory Building on the Rattlesnake Mountain ridgeline were removed. On May 5, the superstructure of a storage shed northwest of the 6652-C Building was demolished (Figures11 and 12). The shed was sprayed with a stabilizer before demolition activities to reduce the amount of windblown debris.

Figure 11. The demolition crew obtained a permit to remove only the above-ground portion of this shed (azimuth northeast).

Figure 12. Demolition activities included cleaning the area of shed debris (azimuth northwest).

On the following day, demolition personnel removed the superstructure of a small shed on the southeastern edge of the 6652-C Building (Figures 13 and 14).

Figure 13. The small shed was demolished, and a trackhoe placed the larger pieces of debris in a dumpster (azimuth north).

Figure 14. Demolition crew members put the remaining debris from the small shed into the trackhoe bucket (azimuth southeast).

On May 12, demolition of the 6652-T Lower Pump House began with removal of the above-ground portion of the structure (Figure 15). At the end of the day, only the slab remained (Figure 16); its removal was scheduled as a separate future activity.

The former pump house was on the east side of Rattlesnake Mountain near site 45BN175, a pre-contact open campsite adjacent to a spring. The archaeological site is unevaluated for the National Register of Historic Places. No cultural resources were observed during the demolition activities, which were conducted in a sensitive manner.

Figure 15. The 6652-T Lower Pump House before demolition (azimuth southwest).

Figure 16. Only the slab of the 6652-T Lower Pump House remained after May 12 demolition activities (azimuth east).

On June 22, the cement foundation slab was removed and the hole was filled (Figure 17), completing demolition of the 6652-T Lower Pump House. The building materials were removed from the former pump house location, and fill dirt from Rattlesnake Mountain was placed in the remaining void.

Figure 17. Site of the former 6652-T Lower Pump House after demolition was completed on June 22 (azimuth north).

Several communications towers on the Rattlesnake Mountain ridgeline also were decommissioned and removed in the ALE footprint reduction project. On May 28, PNNL cultural resources staff met with project managers from CH2M HILL Plateau Remediation Company (CHPRC) to determine the locations where each decommissioned tower could be "felled" or laid down (Figure 18). All locations were walked down to identify any cultural resources present; none were identified.

Figure 18. The tower at the left in the photograph was slated to fall in the road, toward the camera (azimuth north).

Also on May 28, demolition of the 6652-C Space Sciences Building on the Rattlesnake Mountain ridgeline was monitored (Figures 19 and 20).

Figure 19. Demolition on the southeast corner of the 6652-C Building (azimuth north). The southeast and northwest corners of the building already had been demolished.

Figure 20. The northwest corner of the 6652-C Building was demolished (azimuth northeast).

On September 24, demolition crews removed the amateur radio tower structure on the Rattlesnake Mountain ridgeline by picking it up with a forklift and backing the shed down the road to the debris pile to the south of the new 180-foot tower on top of Rattlesnake Mountain (Figure 21). Instead of uprooting and removing the guy wires and their anchors holding the shed to the ground, the crew cut them flush with the ground surface to avoid disturbing the surface that had returned to a natural state. Three concrete plinths were left in the ground but were removed at a later date by the demolition crew with a small trackhoe.

Figure 21. The amateur radio tower structure (azimuth northeast).

4.2 Lower ALE

The guardhouse for the former Nike missile site at the base of Rattlesnake Mountain was demolished on January 18, 2010 (Figures 22 and 23). Crew members prepared the guardhouse for demolition by spraying it with a stabilizer to reduce the amount of windblown debris from the demolition site.

Figure 22. Crew members sprayed the guardhouse at the former Nike missile site with stabilizer prior to demolition (azimuth south).

Figure 23. The guardhouse was demolished within its own footprint and loaded into a debris container (azimuth south).

4.3 Rattlesnake Spring

Under Stipulation C.8 of the MOA, archaeological monitoring occurred during decommissioning and demolition of a well and buildings at Rattlesnake Spring. Between March 15 and March 17, 2010, PNNL cultural resources staff monitored the demolition of the 646 Field Laboratory Building at Rattlesnake Spring (Figures 24 and 25).

Figure 24. A wheel loader demolished the 646 Building (azimuth east).

Figure 25. After demolition, the wheel loader removed the 646 Building cement foundation slab (azimuth south).

On July 26, 2010, excavations to expose the 646 Building wellhead took place (Figure 26). The well location is surrounded by three previously recorded archaeological sites: 45BN826 (approximately 50 meters southeast), 45BN170/171 (approximately 70 meters north), and a newly identified site, 45BN1605 (30 meters southeast). Site 45BN170/170 is eligible for listing on the National Register, but the other two remain unevaluated.

Figure 26. The well crew began decommissioning activities by exposing the well head (azimuth west).

On August 17, PNNL cultural resources staff monitored the final decommissioning activities for the 646 Building well (Figure 27). The PNNL archaeologists identified no cultural resources.

Figure 27. Well decommissioning crew members extracted vertical supply pipes from the well location, and radiation technicians cleared them for contamination (azimuth west). Decommissioning activities concluded by filling the void left by the extracted pipes with sand.

On October 22, two power poles were felled manually, cut in half, and removed from within the boundaries of site 45BN826 at Rattlesnake Spring (Figures 28, 29, and 30). A third pole was outside the site boundary and was removed from the ground by a backhoe.

Workers also backfilled the wellhead for the former 646 Building. The job was conducted professionally, with courtesy and respect for the culturally sensitive archaeological site. No motorized vehicles were allowed beyond the barricades surrounding site 45BN826.

Figure 28. As the poles were felled, they were directed away from site 45BN826 (azimuth north).

Figure 29. The poles were cut in half and removed from site 45BN826 manually, keeping heavy mechanized equipment off the site altogether (azimuth east).

Figure 30. The poles were cut flush with the ground surface using equipment that would not leave a residue behind, such as chainsaw bar oil (azimuth north).

5.0 Paving

On April 28, 2010, PNNL cultural resources staff attended a pre-job meeting with the paving contractor and crew members employed by Mission Support Alliance.

The following day, asphalt paving crews working for Mission Support Alliance began intermittent paving activities on the main road leading to the top of Rattlesnake Mountain. The work consisted of repairing potholes and small linear segments of the neglected road (Figures 29 and 30). The crews observed MOA stipulations to stay on the roadbed with their equipment.

Figure 31. The paving crew prepared to deposit asphalt over the top of a damaged section of roadway (azimuth north).

Figure 32. The paving crew spread and compacted a large linear patch over a section of the roadbed (azimuth southwest).

On May 7, PNNL cultural resources staff monitored continuing paving activities on the road to the top of Rattlesnake Mountain (Figures 33 and 34).

Figure 33. The paving crew concentrated on repairing potholes (azimuth northwest).

Figure 34. Crews patch and repair linear road deterioration (azimuth north).

On May 20, PNNL cultural resources staff again monitored paving activities on the road to the top of Rattlesnake Mountain (Figure 33). They also met with CHPRC project staff to define areas to be used for passing on the roadway and for staging paving trucks and equipment.

Figure 35. Crews repaired the crumbled edge of the pavement (azimuth north).

6.0 Miscellaneous Debris Removal

On April 20 and 21, cultural resources staff monitored the removal of miscellaneous debris items from the landscape near the former Nike missile launch site (archaeological sites 45BN1585 and 45BN1587) (Figures 36 and 37).

Figure 36. A backhoe removed the backup antenna system for the former Nike missile site on Lower ALE (azimuth southwest).

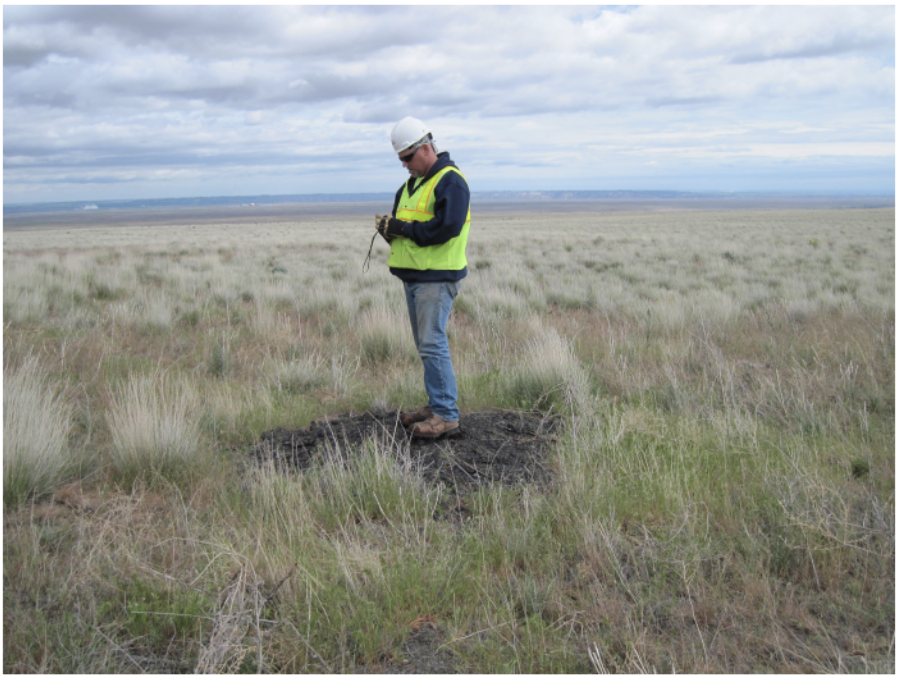


Figure 37. Items removed included piles of asphalt (this photograph), galvanized metal cable, burned wooden communication poles, fiberglass ground vaults, and steel gates (azimuth southeast).

7.0 Power Pole Removal

Under Stipulation C.8 of the MOA, archaeological monitoring was conducted for activities associated with the removal of wooden power poles on the Rattlesnake Mountain TCP. Work began on Lower ALE on March 5, 2011, and was completed on May 5 on Upper ALE.

7.1 Lower ALE

On the first day, 17 poles and line exte[illegible]g between Hodges Well and the former Nike missile launch site on Lower ALE were removed. Three trucks were at the location when the archaeological monitor arrived that morning: a bucket truck for elevating linemen to the top of the poles; a boom truck, which picked up and directed the fall of the power poles; and a tow vehicle to pull the trailer, which physically removed the poles from their locations. Trucks remained on the power line access road.

Work began at Hodges Well, located just south of the Upper ALE access road, and moved northward toward the former Nike site. A safety line was attached to the upper poles on the south side of the Upper ALE access road while the bottoms of the poles were cut with a chainsaw (Figure 38). The poles were cut off as close to the ground surface as possible (Figure 39), loaded onto a trailer with the boom truck, and removed from the area (Figure 40).

Figure 38. Pole removal activities on Lower ALE (azimuth northeast).

Figure 39. The poles were cut off as close to the ground as possible (azimuth north).

Figure 40. The poles were loaded on a trailer for removal (azimuth north).

When the project activities moved north of the Upper ALE access road, work was confined to the power line access road (Figure 41) in accordance with Stipulation C.3 of the MOA. This limitation meant that a more streamlined process had to be employed. The bucket truck operator took the lead and stripped the power poles of their crossmembers, brackets, and hardware, while the boom truck and trailer operators cut and removed the poles. The bucket truck could no longer attach a safety rope to the top of the poles and lower them onto the trailer but was used instead to push the falling power pole in a specific direction after it was cut and place it on the trailer (Figure 42).

Figure 41. The method of pole removal switched to a single-file system so vehicles remained on the road (azimuth north).

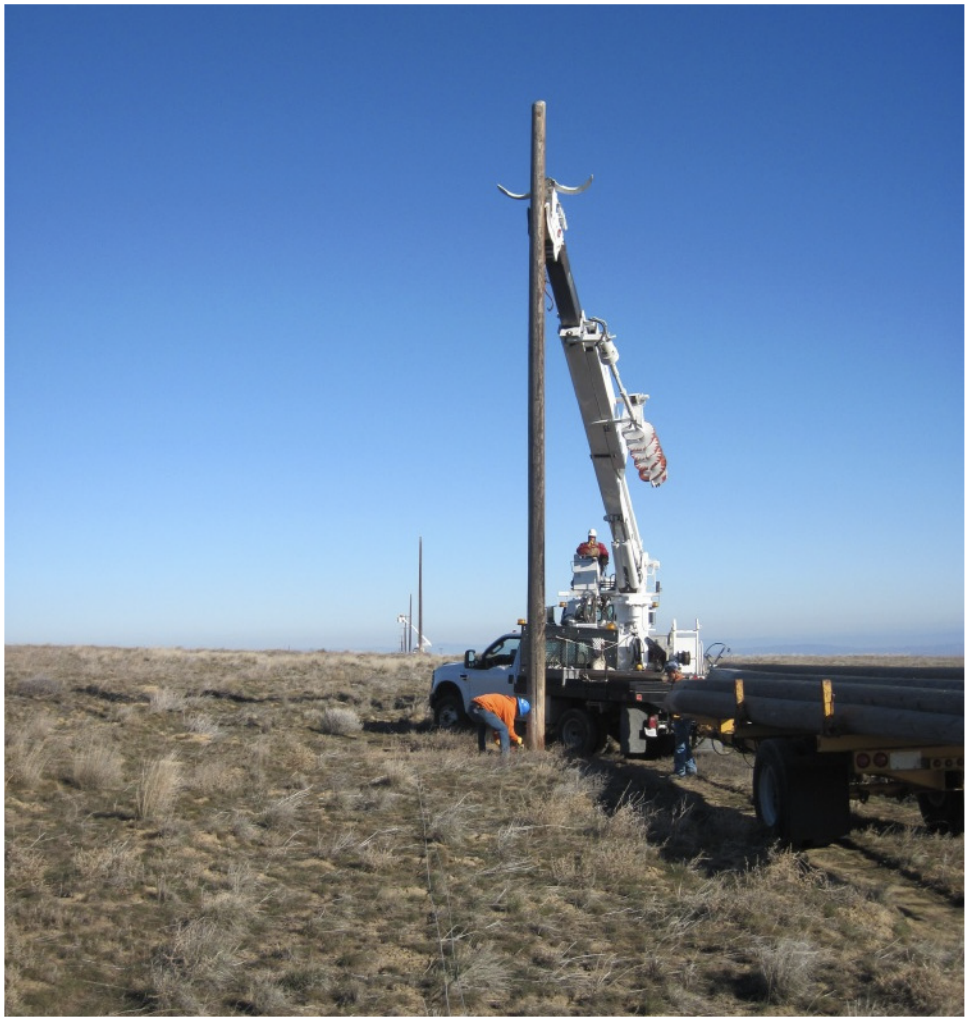


Figure 42. The boom truck pushed the poles in a specific direction after they were cut (azimuth north).

7.2 Upper ALE

On March 6, 2011, the power pole removal crew moved to the Rattlesnake Mountain ridgeline to begin the removal of two main power pole lines with two lateral extensions down the extremely steep slopes on the north side of the mountain. Archaeological monitoring was conducted throughout the removal project because of the sensitivity of the ridgeline as a TCP and to ensure that vehicles remained on existing roads (MOA Stipulation C.3) and that no impacts occurred to archaeological sites and culturally sensitive plants growing on the ridgeline (MOA Stipulation C.6). On March 6, crews removed several poles adjacent to the paved ridgeline road. The power poles were felled on the road to minimize potential disturbance to cultural and biological resources

On April 1, project activities resumed on top of Rattlesnake Mountain and continued through April 3 on a "Friday, Saturday, and Sunday" basis; work began at the southernmost end of Rattlesnake Mountain (Figures 43 and 44). A new system of power pole removal had to be employed here because this first (southern) line of poles was well beyond any improved access routes. All work conducted on the first line of poles was performed by hand to avoid adverse effects to *Laliik*.

Figure 43. Once removed, the power poles, crossmembers, brackets, hardware, and wire were staged in the parking area of the former Nike missile site (azimuth northeast).

A safety rope was secured to the top of the power poles while the linemen working close to the cliff edge removed crossmembers, brackets, hardware, and wire from the poles. Radiological technicians also were present to inspect the poles for contamination. Two vehicles were used simultaneously to bring the poles to the road for removal. One vehicle served as an anchor; the line that secured the top of the power pole went through a pulley on the front of the truck's frame. This line was then attached to the frame on the front of the second truck. By backing up, the second vehicle pulled the power poles to the road where they could be cut up and loaded into transport vehicles. This system allowed the power poles to be

Figure 44. Initial pole work on Rattlesnake Ridge (azimuth north).

moved intact to the narrow road while the trucks never actually left the roadway (Figure 45), thereby protecting cultural and biological resources in this sensitive area. The varying terrain and pole placement created a work environment where creative solutions were the norm (Figure 46).

The two lateral branches of the power line ascended a 45-degree slope (Figure 47). These lines ran uphill from the second main line of poles, which ran from the new CCCF tower area to the former 6652-T Lower Pump House demolished earlier on the eastern side of the mountain (Figure 48). On these steep slopes, ropes were employed to restrict the downhill movement of the poles while they were being moved to the access road (Figure 49). On the first lateral line, the power poles were cut down and then cut in half. The poles were set perpendicular to the slope of the mountain, and three 12-foot nylon straps were wrapped around the poles in three single loops. Three workers then held an end of each strap (one in each hand) and walked the pole halves down the mountain to the power line access road, where they were cut up with a chain saw and loaded into pickup trucks. Workers also removed an extra pole and its hardware, left on the mountainside by the Benton County Public Utility District a number of years ago during installation of new power poles.

Figure 45. Method used to get the poles to the road to be loaded (azimuth south).

Figure 46. Varying terrain required varying strategies (azimuth north).

Figure 47. The steepness of the slope presented logistical challenges (azimuth southeast).

Figure 48. Special care was taken to avoid sensitive plants at the spring (azimuth southwest).

Figure 49. Power poles on the power line access road were felled on that road (azimuth southwest).

The second lateral line angled uphill in excess of 50 degrees with small boulders and large cobbles (talus) arranged randomly but densely on the surface of the ground (Figure 50). The poles along this line were cut down and then in half; but here the poles were placed parallel to the slope of the mountain and rope leashes were tied on the pole halves to control their decent to the access road. One rope was tied on the front to direct/pull the pole, and another rope was tied to the rear of the pole to restrict the forward movement, should the pole get away from the person pulling it downhill. The friction from sliding across the surface of the rocks kept the poles from running away from the workmen. These too were cut up at the access road and loaded into pickup trucks. On this lateral line as well, an extra pole was removed from the slope. No damage occurred to cultural or biological resources on these two very steep slopes.

Figure 50. A lateral power pole line ascended the north side of Rattlesnake Mountain. The removal of each pole represented a unique tactical issue (azimuth southeast).

The surface of the ground where the poles were felled and the access/egress routes for the workers removing the poles were carefully inspected for cultural and biological resources before the poles were cut. As Figure 51 shows, the placement of the wooden power poles on the ground was very directed. Each pole was pulled into a predefined landing area.

Figure 51. Ropes were used to control the landing of each pole (azimuth is east).

On April 26, 2011, a small crew returned to the Rattlesnake Mountain TCP to remove two additional downed power poles lying below the power line access road (Figure 52). These activities were monitored to avoid impacts to the ridgeline of *Laliik* as stipulated in C.3 and C.6 of the MOA.

A two-vehicle pole-retrieval system was again employed using a 300-foot 3/8-inch steel cable (Figure 53). From the narrow pole access road, the pole sections were pulled up the mountainside without damage to cultural or biological resources by placing a nylon choker strap around the center of the poles and then attaching this configuration to the steel cable. One vehicle acted as an anchor while the other vehicle pulled the pole segments to the road, where they were cut up with a chain saw and loaded into a pickup truck.

Figure 52. Cleanup of felled power poles downhill from the power line access road on the right (azimuth north).

Figure 53. Part of the two-vehicle retrieval system (azimuth southeast).

Three additional power pole segments were found on a bench approximately 180 meters below the new CCCF tower on Rattlesnake Mountain. The bench is shown in Figure 54. The slope was in excess of 45 degrees. Although not seen in this photograph, a stand of tall bushes marking a spring occurs on the downhill side of the bench. Several unrecorded features were observed at the spring—a 50-meter trench that appears to drain the spring and two pits excavated into the bench talus nearby. The trench appears to be historic in age because it contains the head of a pickaxe. The pits could not be dated, but both contain historic debris. Historic debris were also found on the bench and covering the slope from the road on top of Rattlesnake Mountain to the bench.

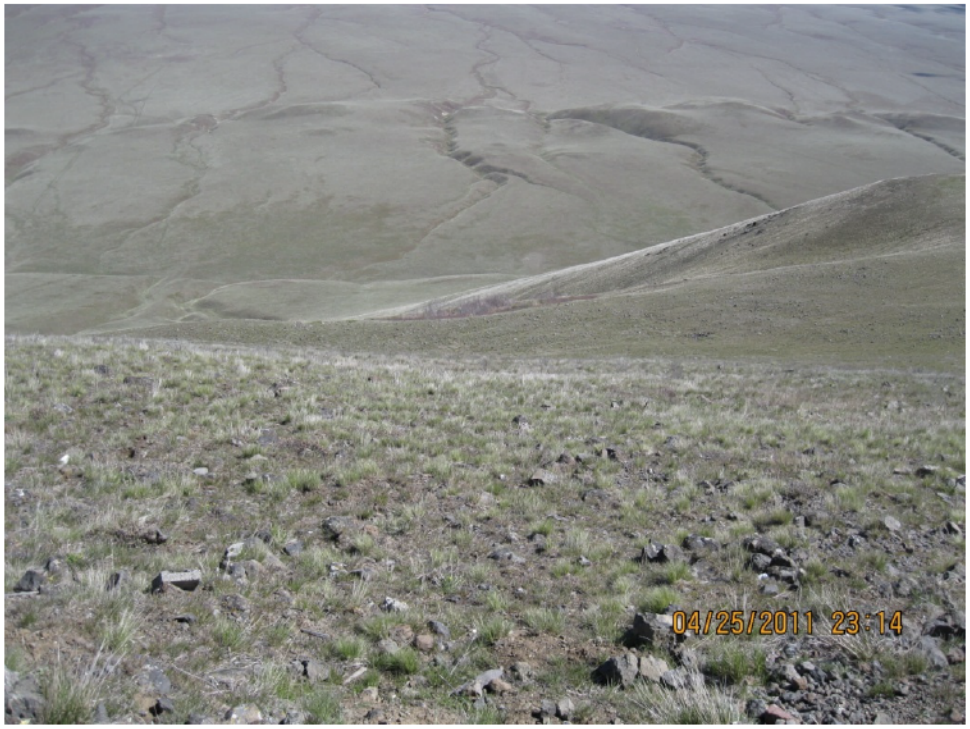


Figure 54. Three recovered power pole segments were removed from a bench, 180 meters down the mountainside (azimuth north).

The two-vehicle pole-retrieval system was used to remove the poles from the bench shown in Figure 54. Three hundred feet of cable was enough to reach the first pole segment located on the slope just above the bench, but four strands of 1,500-pound nylon strap (two per pole segment) had to be attached to the end of the steel cable to reach two pole segments that were located farther below. These segments were carried partway up the mountain to be in the reach of the white nylon straps. This configuration is barely visible in Figure 55; however, the vehicles used to retrieve the poles are out of sight over the edge of mountain on the power line access road. Figure 55 provides some scale to this particular undertaking. The photograph was taken from the bench where the two power pole segments originally rested.

Figure 55. Three recovered power pole segments were pulled up the mountain (azimuth is west).

Figure 56 shows two 4-foot concrete culverts that were also pulled up to the road using the same two-vehicle system. At this location, the power line access road had been bladed, creating a secondary road extending from the new communications tower down the mountainside to the site of the former 6652-T Lower Pump House on the east side of the mountain. It appears a fire swept over this section of the mountain, based on burned wire and pole remnants. This fire may have destabilized the ground surface above the power line access road, creating a need to modify the access road.

Figure 56. Two 4-foot concrete culvert sections were pulled up the mountainside to the access road (azimuth north).

On April 28, efforts began to remove communication wire from the mountainside. Where possible, all five strands of double communication wire and one 12-3 with ground/220-volt wires were attached to the bumper hitch of a pickup truck and pulled from the rubble. This was not always possible, and for much of the route (40%) the wires had to be pulled from the rubble by hand. The original roadbed can be seen as a small ledge and layer of boulders approximately 6 feet below the present access road behind the workman in the foreground (Figure 57).

Figure 57. Wire removal along the power line access road (azimuth north).

On May 5, 2011, the final work was completed on the power pole removal project. One small above-ground section of a power pole was removed (Figure 58), and soil was placed over the "stump." Wire collection activities were carried out on the southernmost pole line as well.

Figure 58. The location of the last power pole cut off and buried below ground (azimuth southeast).

8.0 Archaeological Site Identification and Recordation

During monitoring activities on the Rattlesnake Mountain ridgeline, a previously unrecorded archaeological site was found, 45BN1678. The site is a line of four rock cairns extending approximately 55 meters along the somewhat flat (7-degree slope to the south, parallel to the long axis of the mountain) eastern lip of the Rattlesnake Mountain ridgeline, beginning approximately 25 meters north and 15 meters east of the guard rail at the southern end of the ridgeline near the main paved road. No artifacts were found in the vicinity of the cairns. The age and function of the cairns could not be determined; they could be associated with Native American use of Rattlesnake Mountain or they could be historic. The site is located outside the work area for power pole removal and was avoided by the project, thus it was not evaluated for National Register eligibility. The archaeological site inventory form is included in this report as the Appendix.

9.0 Conclusions

Intermittent archaeological monitoring was carried out for footprint reduction activities on ALE (HCRC# 2008-600-004) as required to resolve adverse effects to the Rattlesnake Mountain TCP. Most of the monitoring was conducted on or near the Rattlesnake Mountain ridgeline, although work was monitored also at Rattlesnake Spring near several pre-contact sites eligible for listing on the National Register. A previously unidentified archaeological site (45BN1678) was found on the Rattlesnake Mountain ridgeline and recorded during this project.

The ALE footprint reduction project suffered several setbacks and delays. However, in spite of these, all who participated came away with a different understanding of "traditional cultural property" and what it means to conduct a project in a sensitive area. Three incidents of off-road driving occurred at three pre-contact sites: 45BN1391[1] and 45BN1610[2] on the Rattlesnake Mountain ridgeline and 45BN1605[3] at Rattlesnake Spring. Regardless, most of the work was consistent with the stipulations outlined in the MOA.

The lessons learned from this project suggest that archaeological monitoring of projects on the Hanford Site is warranted. Monitoring was responsible for preventing much of the off-road driving that could have occurred because land-use regulations are often not communicated to the people in the field. With adequate information and archaeological/biological monitors on site, the work crews performed admirably.

The majority of the work was performed on weekends, in addition to the normal duties and responsibilities of the workers. Even with these additional demands on their lives and time, the work was completed on time and in a professional manner. No cultural or biological resources were destroyed by this project; in fact, great care was demonstrated by the workmen of both Mission Support Alliance and CH2M HILL Plateau Remediation Company to ensure no damage occurred. Due to the sensitive manner in which project leaders and field staff performed their work, adverse effects to *Laliik* were minimized, and no adverse effects occurred to other cultural resources.

10.0 References

DOE-RL. 2010. *Hanford Site Active Cleanup Footprint Reduction*. DOE/RL-2010-18, U.S. Department of Energy Richland Operations Office, Richland, Washington.

Hughes SS, JL Gutzeit, and ES White. 2010. *Third Supplemental Cultural Resources Review for the Infrastructure Cleanup on the Fitzner/Eberhardt Arid Lands Ecology Reserve, 600 Area, Hanford Site, Benton County, Washington – HCRC# 2008-600-004D*. PNNL-19352, Pacific Northwest National Laboratory, Richland, Washington.

Kennedy EP, DP McFarland, RS Weeks, AR Till, JL Downs, and MS Sackschewsky. 2009. *Cultural Resources Review for the Rattlesnake Mountain Combined Community Communication Facility and Infrastructure Cleanup on the Fitzner/Eberhardt Arid Lands Ecology Reserve, 600 Area, Hanford Site, Washington State (HCRC# 2008-600-004)*. PNNL-18406, Pacific Northwest National Laboratory, Richland, Washington.

[1] "Rattlesnake Mountain: Corrective Actions on Off-Road Driving Incident in Archaeological Site 45BN1391." Report presented to Hanford Site Tribal Issues Meeting, May 19, 2010, by Eric White, Pacific Northwest National Laboratory, Richland, Washington.

[2] *Rattlesnake Mountain (Laliik): Assessment of Off-Road Vehicle Tracks to Archaeological Site HT-2010-019 and to Laliik—A Traditional Cultural Property (June 4, 2010)*. Unpublished report submitted to DOE-RL Tribal Affairs and Cultural Resources Program by Eric White, Pacific Northwest National Laboratory, Richland, Washington.

[3] *Rattlesnake Springs: Archaeological Site Assessments for Off-Road Driving Incident (September 9, 2010)*. Unpublished report submitted to DOE-RL Tribal Affairs and Cultural Resources Program by Eric White, Pacific Northwest National Laboratory, Richland, Washington.

McFarland DP and CS Dage. 2009. *Supplemental Cultural Resources Review for the Infrastructure Cleanup on the Fitzner/Eberhardt Arid Lands Ecology Reserve, 600 Area, Hanford Site, Washington State (HCRC# 2008-600-004A)*. PNNL-18841, Pacific Northwest National Laboratory, Richland, Washington.

McFarland DP and E Prendergast-Kennedy. 2010. *Cultural Resources Review Letter Report for Class C Debris Piles on the Fitzner/Eberhardt Arid Lands Ecology Reserve, Hanford Site HCRC# 2008-600-004C*. Pacific Northwest National Laboratory, Richland, Washington.

Sharpe J, RB DeMaris, and K Mendez. 2010. *Fourth Supplemental Cultural Resources Review for the Infrastructure Cleanup on the Fitzner/Eberhardt Arid Lands Ecology Reserve, 600 Area, Hanford Site, Benton County, Washington (HCRC# 2008-600-004E)*. CH2M HILL, Inc., Richland, Washington.

Appendix

State of Washington
Archaeological Site Inventory Form

~~OFFICIAL USE ONLY~~

STATE OF WASHINGTON
ARCHAEOLOGICAL SITE INVENTORY FORM

Smithsonian Number:
45BN1678
***County:** Benton

***Date:** 5/24/2011 ***Compiler:** Eric White

Location Information Restrictions *(Yes/No/Unknown)*: Yes

SITE DESIGNATION

Site Name: Four Rock Cairn Site

Field/ Temporary ID: HT-2011-060

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Pre-Contact Cairn ?

SITE LOCATION

***USGS Quad Map Name:** Iowa Flats, Wash. 1974

***Legal Description:** **T**11 **R** 26 **E/W:** E **Section(s):** 32

Quarter Section(s): NW1/4, SE1/4, SW1/4

***UTM:** **Zone** 11 **Easting** 1193523.2 **Northing** 462333.4- **NAD 27**-Center of each rock cairn

1193523.8	462333.8	Cairn #2
1193524.1	462334.1	Cairn #3
1193524.7	462334.3	Cairn #4

NAD 27
Latitude: 46° 23' 33.916 **Longitude:** 119° 35' 19.654-Center of Cairns

Elevation (ft/m): 3440 ft/1048.5 m

Other Maps: **Type:** 7.5 Minute

Scale: 1:24,000 **Source:**

Drainage, Major: Columbia River **Drainage, Minor:** Columbia River **River Mile:**

Aspect: 130° **Slope:** 7%

***Location Description** *(General to Specific)*: The site is located on a flat area on the top of Rattlesnake Mountain, at the south end of the ridge.

***Mandatory Information for Official Smithsonian Number designation.** *Revised 10/2008*

~~OFFICIAL USE ONLY~~

Approach *(For Relocation Purposes)*:

The site is located 19 miles from the State Route (SR) 240 Bi-Pass turn off in Richland, Washington. From the SR 240 turn-off, proceed 9 miles northwest on SR 240 toward the Vernita Bridge. Turn left (west) off SR 240 on to the Benton City Road and proceed west for 2 miles to the Fitzner/Eberhardt Arid Lands Ecology Reserve (ALE). At the Fitzner/Eberhardt Arid Lands Ecology Reserve sign, turn right (northwest) and proceed on the lower ALE road for 3 miles to a "T" in the road. Turn left (west) at the "T" and proceed 5 miles up Rattlesnake Mountain to a guardrail fence on top. Proceed approximately 25 meters past the south end of the guardrail and stop. The site is approximately 15 meters to the left (east), between the guardrail and the lip of the mountain.

SITE DESCRIPTION

***Narrative Description**: A pre-contact site(?) exists for approximately 55 meters along the somewhat flat (7-degree slope to the south; parallel to the long axis of the mountain) eastern lip of the Rattlesnake Mountain ridge, beginning approximately 25 meters north and 15 meters east of the guardrail at the southern end of the ridge line near the main paved road. The site is characterized by four rock cairns. The edge of the flat mountain ridge is located approximately 3 to 5 meters east of these four rock cairns.

The antiquity of these cairns is not known. Their low profile makes them appear to be pre-contact features; however, the limited lichen *(Lecanora muralis)* growth,[1] and their symmetrical placement on the ground[2] in relation to each other suggest they could be historic in origin.

[1] An average growth rate has been observed for the lichen species *Lecanora muralis* on concrete structures around the Hanford Site area. It can average approximately 1 mm growth per year.
[2] Of the four cairns arranged in a straight line, the two outside features are placed 51 feet from the inner features (see sketch on page 10).

***Site Type** *(Refer to the DAHP Survey and Inventory Guidelines Page 19)*: Pre-Contact Cairn ?

***Site Dimensions**

***Length:** 55 M ***Direction:** N-S x ***Width:** 10 M ***Direction:** E-W

***Method of Horizontal Measurement:** Tape measure

***Depth:** Unknown M * **Method of Vertical Measurement:** N/A

Vegetation** *(On Site)*: ***Apiaceae: ***Lomatium canbyi*** - Canby's desertparsley, ***Lomatium dissectum*** - fernleaf desertparsley, ***Lomatium gormanii*** - Coult. & Rose Gorman's desertparsley, ***Lomatium triternatum*** - nineleaf desertparsley. ***Asteraceae***: ***Antennaria dimorpha*** - low pussytoes, ***Artemisia tripartite*** - threetip sagebrush, ***Balsamorhiza rosea*** - rosy balsamroot, ***Crepis barbigera*** - Leiberg's hawksbeard, ***Crepis occidentalis*** Nutt. ssp. ***Conjuncta*** - western hawksbeard, ***Erigeron corymbosus*** - longleaf fleabane, ***Eriophyllum lanatum*** - Smiley woolly sunflower, ***Madia exigua*** - Gray little tarweed, ***Microseris troximoides*** - false mountain dandelion, ***Senecio integerrimus*** - lambstongue groundsel, ***Stephanomeria tenuifolia*** -rush skeletonplant, ***Tetradymia canescens*** - horsebrush, ***Boraginaceae***: ***Lithospermum arvense*** - corn gromwell, ***Lithospermum ruderale*** - western gromwell, ***Mertensia longiflora*** - small bluebells, ***Arabis cusickii*** - Cusick's rockcress, ***Phoenicaulis cheiranthoides*** - daggerpod, ***Caryophyllaceae***: ***Silene douglasii*** - Douglas' catchfly, ***Sedum leibergii*** - Leiberg's stonecrop, ***Fabaceae***: ***Astragalus lentiginosus*** - freckled milkvetch, ***Lupinus laxiflorus*** Dougl. - spurred lupine, ***Lupinus sulphureus*** - sulfur lupine, ***Lamiaceae***: ***Agastache occidentalis*** - western horsemint, ***Monardella odoratissima*** - coyote mint, ***Liliaceae***: ***Allium macrum*** - rock onion, ***Brodiaea douglasii*** - Douglas' clusterlily, ***Zigadenus venenosus*** - meadow deathcamas, ***Oenothera hilgardii*** - desertprimrose, ***Agropyron spicatum*** - bluebunch wheatgrass, ***Poa juncifolia*** - alkali bluegrass, ***Poa nevadensis*** - Nevada bluegrass, ***Collomia linearis*** - narrowleaf collomia, ***Phlox hoodii*** - Hood's phlox, ***Eriogonum thymoides*** - thymeleaf buckwheat, ***Portulacaceae***: ***Montia cordifolia*** - Hoffmann broadleaf springbeauty, ***Saxifragaceae***: ***Lithophragma bulbifera*** - bulbiferous fringecup, ***Lithophragma glabra*** - smooth fringecup, ***Scrophulariaceae***: ***Castilleja thompsonii*** - Thompson's paintbrush, ***Penstemon glandulosus*** Dougl. - stickystem beardtongue, and ***Penstemon speciosus*** - showy beardtongue.

Local: Thyme leaf buckwheat **Regional:** Sage Steppe

Landforms *(On Site)*: Mountain **Local:** Mountain Top

Water Resources *(Type)*: **Spring on the east side of Rattlesnake Mountain** **Distance:** 800 m northeast **Permanence:** Yes

***Mandatory Information for Official Smithsonian Number designation.** *Revised 10/2008*

CULTURAL MATERIALS AND FEATURES

***Narrative Description:**

Cairn #1 – 150 cm E-W by 120 cm N-S by 18 cm high, ~16 rocks - southernmost cairn, 3.5 meters from the east lip of the ridge

Cairn #2 – 110 cm E-W by 110 cm N-S by 15 cm high, ~33 rocks - second cairn from the south, 4 meters from the east lip of the ridge

Cairn #3 – 150 cm E-W by 190 cm N-S by 15 cm high, ~85 rocks - third cairn from the south, 4.9 meters from the east lip of the ridge

Cairn #4 – 140 cm E-W by 210 cm N-S by 23 cm high, ~75 rocks - northern most cairn, 3.6 meters from the east lip of the ridge

***Method of Collection(s):** Nothing Collected

***Location of Artifacts** *(Temporary/Permanent)*: Nothing was collected

SITE AGE

***Component:** ***Dates:** ***Dating Method:**

***Phase:** **Basis for Phase Designation:**

SITE RECORDERS

Observed by: Eric White **Address:** 902 Battelle Blvd. Richland, WA. 99352

***Date Recorded:** 05/24/2011

***Recorded by** *(Professional Archaeologist)*: Eric White

***Affiliation:** Pacific Northwest National Laboratory ***Affiliation Phone Number:** 509-375-7665

***Affiliation Address:** 902 Battelle Blvd. Richland, WA. ***Affiliation E-mail:** eric.white@pnnl.gov

Date Revisited: **Revisited By:**

SITE HISTORY

Previous Work *(Done on Archaeological Site)*: None

***Mandatory Information for Official Smithsonian Number designation.** *Revised 10/2008*

LAND OWNERSHIP

***Owner:** Department of Energy

***Address:** Federal Bldg, 825 Jadwin Ave, Suite 1, P. O. Box 550, Richland WA. 99352

***Tax Lot/ Parcel No:**

RESEARCH REFERENCES

***Items/Documents Used In Research** *(Specify)*:

McCune B. 2010. *Key to the Lichen Genera of the Pacific Northwest*, Department Botany & Plant Pathology, Oregon State University, Corvallis, Oregon 97331-2902.

McCune B. (Personal Communication, 2011).

Rosentreter R, M Bowker, and J Belnap. 2007. *A Field Guide to Biological Soil Crusts of Western U.S. Drylands Common Lichens and Bryophytes*. U.S. Government Printing Office, Denver, Colorado.

USDA Plants website. 2011. http://plants.usda.gov/java/

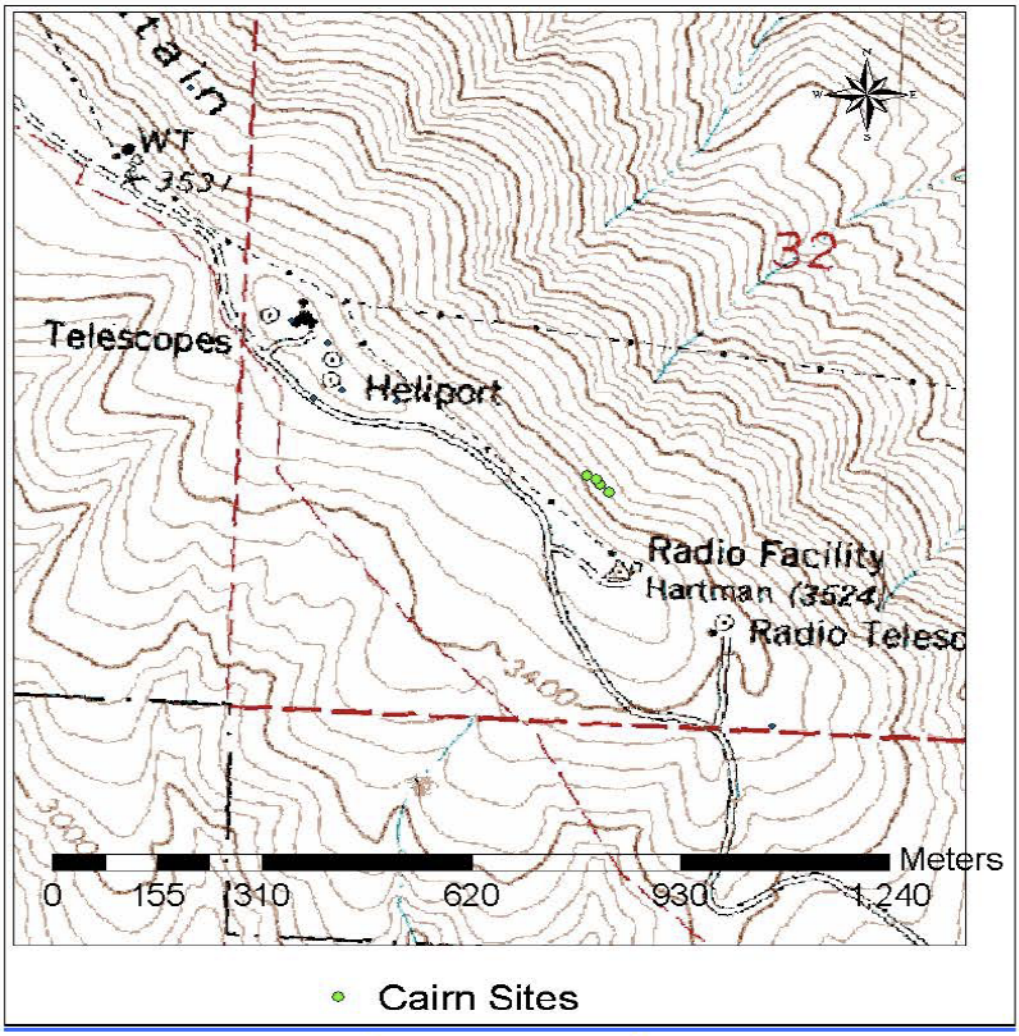
***Mandatory Information for Official Smithsonian Number designation.** *Revised 10/2008*

USGS MAP

***Quad Name:** Iowa Flats, Wash.

***Series:** 7.5

***Date:** 1974

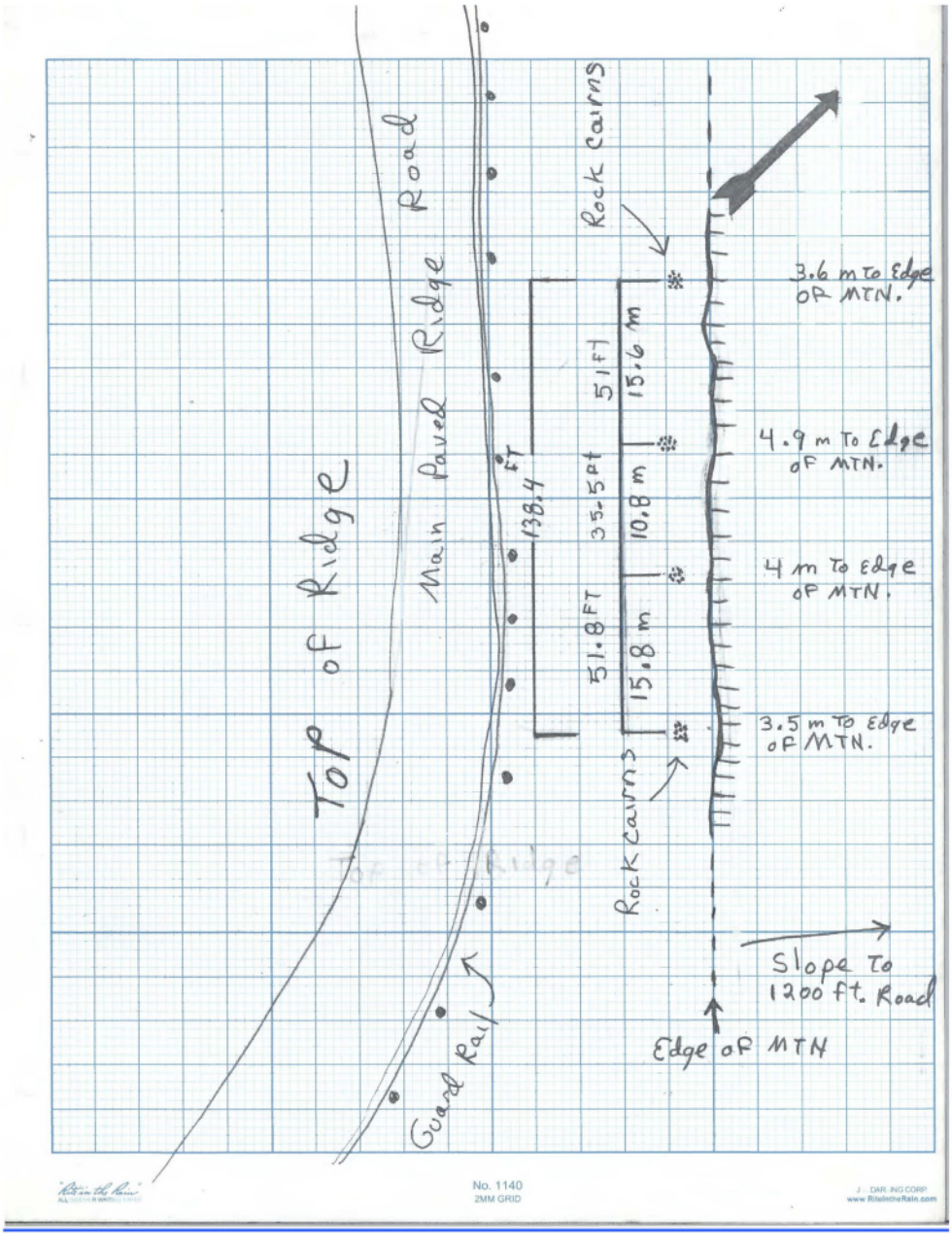


HIGHLIGHTING SITE

LOCATION AND BOUNDARIES

SKETCH MAP

***Sketch Map Description:**



***Mandatory Information for Official Smithsonian Number designation.** *Revised 10/2008*

***Legend:** **Known Boundary Symbology:**

Possible Boundary Symbology:

Other Symbols *(Other Than USGS)*:

***Scale:**

***North Arrow** *(Magnetic/True North)*: Magnetic

PHOTOGRAPH(S)

***Photograph Description(s):**

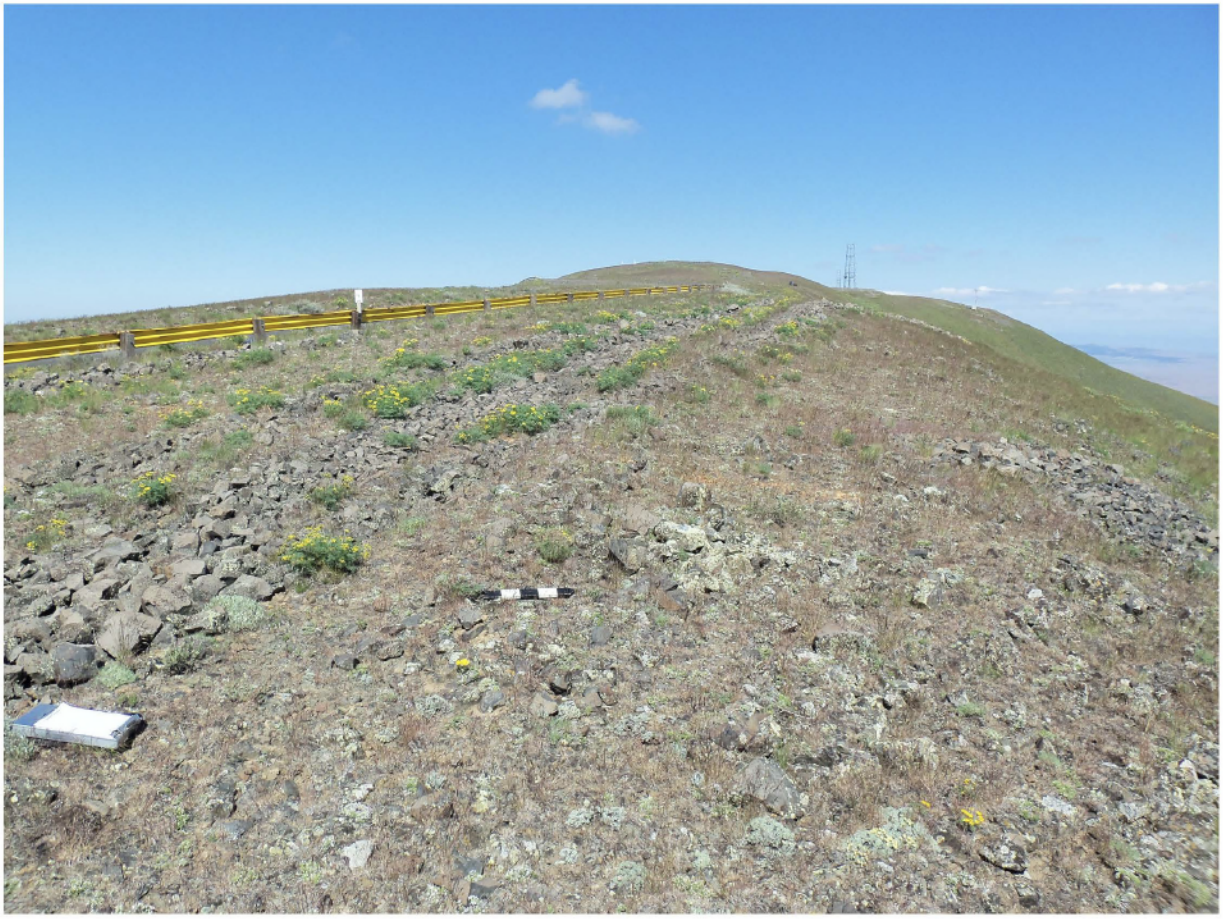
Photograph 1. Rock cairn # 1 (southern most cairn). Azimuth is 73°, 150 cm East to West, 120 cm North to South, and 18 cm high, ~16 rocks.

Mandatory Information for Official Smithsonian Number designation. *Revised 10/2008*

Photograph 2. Rock cairn # 2 (second cairn from the south). Azimuth is 73°, 110 cm East to West, 110 cm North to South, and 15 cm high, ~33 rocks.

Photograph 3. Rock cairn # 3 (third cairn from the south). Azimuth is 34°, 150 cm East to West, 190 cm North to South, and 15 cm high, ~85 rocks.

Photograph 4. Rock cairn # 4 (fourth cairn from the south). Azimuth is 308°, 140 cm East to West, 210 cm North to South, and 23 cm high, ~75 rocks.



Photograph 5. Rock Cairn #4 (Azimuth is 340°) and its relationship to two communication ditches to the west (left). If additional pre-existing rock cairns were located to the north of cairn #4, the ditches would have destroyed them.

CONTINUATION/ ADDENDUM SHEET

Label all additional pages by corresponding headings.

(e.g. Site Description, Site History, Research References)

***Mandatory Information for Official Smithsonian Number designation.** *Revised 10/2008*

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