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DESERT RESEARCH INSTITUTE
CULTURAL RESOURCES REPORT SR051321-1
PROJECT NO. 2115MIT

Historic Significance and Current Condition Assessment of Building 06-CP-170, the Yucca Flat Weather Station, Area 6, Nevada National Security Site, Nye County, Nevada

Prepared by

Tatianna Menocal, Laura O'Neill, Jeffrey Wedding, and Cheryl Collins
Division of Earth and Ecosystem Sciences
Desert Research Institute, Las Vegas, Nevada

July 2021

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Cover Photo: Building 06-CP-170, view east (Photo: DSC_2990. DRI 2021).

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Prepared for

U.S. Department of Energy
National Nuclear Security Administration
Nevada Field Office
Las Vegas, Nevada

Submitted by

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July 2021

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EXECUTIVE SUMMARY

This report was produced in partial fulfillment of the mitigation of adverse effects to Building 06-CP-170, the Yucca Flat Weather Station on the Nevada National Security Site (NNSS), and is intended to comply with the 2021 *Memorandum of Agreement DE-GM58-21NA25543 Between the U.S. Department of Energy and the Nevada State Historic Preservation Officer Regarding Demolition of Fourteen Buildings and Structures in Area 6 of the Nevada National Security Site, Nye County, Nevada* (hereafter referred to as the MOA). This MOA was executed to resolve adverse effects from the U.S. Department of Energy (DOE) plan to demolish 14 architectural resources at the Control Point and in the vicinity in Area 6 of the NNSS. The management and operations contractor for the NNSS identified these 14 architectural resources as environmental hazards unsafe for human occupation due to deterioration and rodent infestation. Building 06-CP-170 is scheduled for demolition as part of this undertaking.

Building 06-CP-170 was originally recorded in 2018 during a Section 106 cultural resources inventory for a proposed installation of a 138-kilovolt transmission line on the NNSS. The building was determined individually eligible by the DOE, in consultation with the Nevada State Historic Preservation Office, for inclusion in the National Register of Historic Places under the Secretary of the Interior's Significance Criterion A because of its association with nuclear testing.

Pursuant to Stipulation III.D.3 of the MOA, this report provides a summary of the historic significance of Building 06-CP-170 and a description of its current condition and accessory resources. In addition, an updated Architectural Resource Assessment (ARA) form with new information and photographs is included in the appendix in fulfillment of Stipulation III.D.2.

ACKNOWLEDGMENTS

Staff at DRI completed this project. Tatianna Menocal, who meets the Secretary of the Interior's Professional Qualification Standards for Archaeologist, prepared this report. Laura O'Neill, who meets the Secretary of the Interior's Professional Qualifications Standards for Architectural Historian, reviewed the content of the report. Archaeologist Jeffrey Wedding took high-resolution digital photographs of the building and its accessory resources. Both Menocal and archaeologist Cheryl Collins produced maps. Collins further assisted with a full review of the updated ARA form. Project Director Maureen King provided feedback and edits throughout the preparation of this report. Nicole Damon completed a full editorial review. Archaeologist Megan Stueve assisted with report and ARA form preparation.

Rick Lantrip, a meteorological technician for the Air Resources Laboratory (ARL) of the National Oceanic and Atmospheric Administration (NOAA), aided with the production of this report. The author greatly benefitted from Lantrip's extensive knowledge of the meteorological program on the NNSS and the historical information and photographs he provided.

Carrie Stewart, National Environmental Policy Act Compliance Officer for the NNSA/NFO, served as the program manager overseeing this project. Tom Folk and Brett Guinan, Principal Facility Specialists with Mission Support and Test Services LLC (MSTS), coordinated access to Building 06-CP-170 and provided an opportunity to document the building's interior.

The author also wishes to thank Martha DeMarre for her assistance in obtaining historical documents from the Nuclear Testing Archive.

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GLOSSARY OF METEOROLOGICAL TERMS

This report uses a variety of terms that are specific to the science of meteorology. The following brief glossary of meteorological terminology has been provided to assist the reader with reading and interpreting the contextual and descriptive text contained herein.

Ceiling: The height ascribed to the lowest layer of clouds.

Ceiling Projector: A type of cloud-height indicator that uses a searchlight to vertically project a narrow beam of light onto a cloud base.

Radiosonde: An expendable meteorological instrument package, often borne aloft by a balloon that measures the vertical profiles of atmospheric variables (such as temperature, humidity, and pressure) and transmits the data to a ground receiving system.

Radome: A dome used to cover the antenna assembly of a radar to protect it from the effects of weather.

Rawinsonde: A method of upper-air observation that includes determinations of wind speed and direction.

Sounding: A measurement of the vertical profiles of atmospheric variables (such as temperature, humidity, and pressure).

Tetroon: A tetrahedron-shaped weather balloon made from plastic film used to carry meteorological instruments aloft.

Theodolite: An optical surveying instrument with a rotating telescope for measuring horizontal and vertical angles.

INTRODUCTION

This report provides documentation in partial fulfillment of the mitigation of adverse effects of Building 06-CP-170, the Yucca Flat Weather Station at the Nevada National Security Site (NNSS). Formerly known as the Nevada Test Site, the NNSS played a crucial role as a testing ground for nuclear devices for the United States during the Cold War with the former Soviet Union.

This submission is intended to comply with Stipulation III.D.3 of the 2021 *Memorandum of Agreement DE-GM58-21NA25543 Between the U.S. Department of Energy and the Nevada State Historic Preservation Officer Regarding Demolition of Fourteen Buildings and Structures in Area 6 of the Nevada National Security Site, Nye County, Nevada* (hereafter referred to as the MOA). Pursuant to Stipulation III.D.3 of the MOA, this report provides a summary of the significance of the historic property and a description of its current condition.

Appendix A of this report contains the resource form for Building 06-CP-170. The resource form consists of an Architectural Resource Assessment (ARA) documenting the condition of the building as it was first documented in 2018 and an update completed as part of the current documentation effort. In accordance with Stipulation III.D.2 of the MOA, the current update of the ARA form includes:

- New information about Building 06-CP-170 and its accessory resources as a result of a recent architectural survey;
- Additional detailed color images of Building 06-CP-170 and its accessory resources and a photodirectional map with a key;
- Historical photographs from archival sources;
- An annotated sketch plan of Building 06-CP-170; and
- Engineering drawings.

In accordance with Stipulation III.E.1 of the MOA, this report, the building's ARA form, photographs, and all associated image files related to the mitigation of Building 06-CP-170 will be archived at the Nuclear Testing Archive located on the second floor of the Rogers Building at Desert Research Institute (DRI) in Las Vegas, Nevada.

PROJECT DESCRIPTION

The MOA was executed to resolve adverse effects from the plan by the U.S. Department of Energy (DOE) to demolish 14 architectural resources at the Control Point and vicinity in Area 6 of the NNSS. The management and operations contractor for the NNSS identified these 14 architectural resources as environmental hazards unsafe for human occupation due to deterioration and rodent infestation. In addition, none of the resources can be suitably repurposed to support the current national security mission of the NNSS.

At the request of the DOE, DRI completed an identification and evaluation of the 14 buildings and structures scheduled for demolition at the Control Point and in the vicinity to comply with Section 106 of the National Historic Preservation Act (Menocal et al. 2020; Reed 2020). The "Control Point" refers to the Control Point Facility, which was the command center for timing and firing operations for nuclear testing on the NNSS from 1951 to 1992. "Vicinity" denotes the geographic area extending north of the Control Point for approximately 1.5 mi. Although associated with nuclear testing, resources in the vicinity did not directly support the operations at the Control Point. Buildings and structures located both at the Control Point and in the vicinity are designated with a "06-CP" prefix in front of their NNSS building number to indicate their location. The "06-CP" prefix is not indicative of a functional relationship to the

Control Point. The Control Point and vicinity spans from Yucca Pass at the southern extent of Yucca Flat north toward Yucca Lake for approximately 2 mi.

Building 06-CP-170, located in the vicinity 1.5 mi. north of the Control Point Facility, is scheduled for demolition as part of this undertaking. The building was originally recorded in 2018 during a Section 106 cultural resources inventory for a proposed installation of a 138-kilovolt transmission line on the NNSS (Menocal et al. 2019). The building, assigned State Historic Preservation Office (SHPO) Resource Number B17825, was determined individually eligible by the DOE, in consultation with the SHPO, for inclusion in the National Register of Historic Places (NRHP) under the Secretary of the Interior's Significance Criterion A (36 CFR 60.4) because of its association with nuclear testing (Reed 2019).

HISTORIC SIGNIFICANCE

This section provides contextual and thematic narratives related to Building 06-CP-170 and its historic significance. The context and theme with which the property is associated are nuclear testing during the Cold War and weather observation on the NNSS, respectively.

Nuclear Testing on the NNSS

Nuclear testing has been a major and important part of the history of Nevada and the United States. (Tlachac 1991). Much of this activity revolved around the NNSS, where most of the developments and experiments in nuclear weapons were tested both above- and belowground. The consequences of this activity have been felt worldwide and, most notably, played a vital role in the national defense of our country and helped shape world politics. The NNSS achieved national and international historic significance as a key battlefield in the Cold War, which pitted the United States and its North Atlantic Treaty Organization (NATO) allies against the Soviet Union and its allies (Fehner and Gosling 2006).

The history of the NNSS began in the late 1940s, when a search was conducted to establish a nuclear test site in the continental United States that was remote from major population centers but near the nuclear research laboratories (Fehner and Gosling 2006; Titus 1986). Testing within the boundaries of the continental United States would significantly decrease the time and effort for conducting the tests. It would also be more cost effective than the low- and high-yield nuclear tests that were being conducted at the Pacific Proving Grounds because transporting personnel and equipment back and forth between the test area and the scientific laboratories in the continental United States was expensive and time consuming (Campbell et al. 1983:171; Lay 1950; Ogle 1985:44; Tlachac 1991). The Korean War, which began in 1950, provided further impetus to finding a continental testing site because of security concerns for the Pacific testing site (DTRA 2002:77; Friesen 1995:4).

The ideal continental test site would have favorable and predictable weather and terrain conditions to test year-round, the land would be under federal control, and it would have an infrastructure already in place (Lay 1950; Tlachac 1991). Additional desirable factors were security, remoteness from populated areas, and in proximity to the scientific laboratories in New Mexico. The Las Vegas Bombing and Gunnery Range in southern Nevada best met these conditions (Fehner and Gosling 2006:43). The range also had large, flat terrain for conducting the tests; westerly prevailing winds away from the densely populated west coast; and natural topographic barriers to screen the test areas from public viewing. Based on the recommendations of the Los Alamos National Laboratory (LANL), the Atomic Energy Commission (AEC), and the National Security Council, President Truman approved the new test site location on December 18, 1950.

The AEC initially made use of the existing nearby facilities and services of the U.S. Air Force to prepare for the first tests at the new test site (Fehner and Gosling 2000:50). Lacking facilities at the site, the AEC hired McKee Construction Company and REECo to begin preparing for the first tests, focusing primarily on the ground zero area in Frenchman Flat (Campbell et al. 1983:174; Fehner and Gosling 2000:51, 64). The first nuclear test operation on the NNSS, named Ranger, occurred on Frenchman Flat and began on January 27, 1951, with the Able test and ended with the Fox test on February 6 (Fehner and Gosling 2000:70, 75; NNSA/NFO 2015; Ogle 1985:43-44; Titus 1986:58). For the next series of tests in the fall of 1951, as a safety measure, the primary testing area was moved from Frenchman Flat to Yucca Flat and construction of permanent facilities began with the Control Point in Area 6, utility and operational structures, communications, and additional accommodations (Fehner and Gosling 2000:81).

Nuclear testing at the NNSS can generally be divided into two types: atmospheric tests from 1951 to 1962 and underground tests from 1957 to 1992. Two exceptions are crater type underground tests, the Uncle test in 1951 and the Effects SubSurface (ESS) test in 1955. For atmospheric tests, nuclear devices were initially dropped from airplanes, but were later placed near the ground on top of towers, and eventually elevated by balloons to the desired height. The main objectives of this early testing were to monitor and measure results, perfect testing methods, and improve nuclear weapon technology. Another objective was to determine the physical effects of nuclear weapons, which was typically carried out by the Department of Defense (DTRA 2002). The first underground nuclear test, named Uncle, was a crater test in Yucca Flat in November 1951 (NNSA/NFO 2015). Crater tests were designed to create a crater by placing a device shallowly enough beneath the surface to produce a throw-out of earth when the device was detonated (NNSA/NFO 2015). The first shaft type underground test was Pascal-A in July 1957 (NNSA/NFO 2015) with the first contained underground test and the first tunnel test in September 1957, named Rainier. Underground testing posed new engineering challenges and learning experiences, and underground containment of nuclear explosions became a major focus to protect workers and reduce public concerns (Carothers 1995; Johnson et al. 1959; Malik et al. 1981).

Both the United States and the former Soviet Union ceased nuclear testing in 1958 by self-imposed moratoriums at the urging of internal and external forces (Ogle 1985:30-31), but by 1961 both superpowers were once again conducting tests. Except for a few surface and near-surface tests, most of the tests after the moratorium were conducted underground, and after the Limited Test Ban Treaty among the United States, the Soviet Union, and Great Britain was ratified in 1963, all weapons-related tests were conducted underground (Friesen 1995:6).

Most underground tests on the NNSS between 1963 and 1992 were conducted in vertical shafts or in tunnels on Yucca and Frenchman Flats, around Shoshone Mountain, and on Buckboard, Pahute, and Rainier Mesas. Most vertical shaft tests were for developing new weapon systems, whereas the tunnel tests were generally for evaluating the effects of radiation from a nuclear explosion on military hardware and systems (Brady et al. 1989; OTA 1989; Wolff 1984). The vertical shaft tests were the most common, representing over 90 percent of the tests, and were primarily placed on Yucca Flat or on Pahute Mesa if they were large-yield tests. The borehole of a vertical shaft test was up to 10 ft. in diameter and from 89 ft. to more than 4,765 ft. deep (NNSA/NFO 2015). Some horizontal tunnels extended over a mile in length from the portal. On September 23, 1992, the Divider event took place in a vertical shaft on Yucca Flat, becoming the last nuclear weapons test conducted at the NNSS (NNSA/NFO 2015).

In all, 928 nuclear tests were conducted at the NNSS, with 119 performed in the 1950s and 809 after testing recommenced following a short moratorium between 1958 and 1961, which was agreed to by both the United States and the former Soviet Union (Friesen 1995, NNSA/NFO 2015). In 1992, the United States established a second self-imposed moratorium on nuclear testing. In 1995, President Clinton announced a total ban on all critical U.S. nuclear weapons testing. In September 1996, the United Nations approved the Comprehensive Test Ban Treaty, which prohibited any nuclear explosion. However, the U.S. Senate failed to ratify this treaty (Medalia 2003).

Weather Observation on the NNSS

As a safety measure in support of nuclear testing, meteorological data began to be collected as early as the 1950s. Initially, the U.S. Air Force Weather Service and the civilian agency, the United States Weather Bureau (USWB), conducted meteorological activities for the NNSS. The U.S. Air Force Weather Service first supported nuclear testing during Operation Ranger in 1951 with forecasts and data on surface winds made by an advisory panel based at a weather station at Nellis Air Force Base. By the next operations, Buster and Jangle in 1951, the advisory panel moved to the Control Point in Area 6. This advisory panel generally met with the Test Panel and the Test Manager during a readiness briefing prior to a test to discuss the latest forecast of winds and weather and any expected changes in the scheduling of the test (Palevsky 2004a, 2004b). If there was unfavorable weather prior to a test, such as a change in wind direction or significant precipitation, personnel gathered additional soundings (which are meteorological vertical profiles of the atmosphere) to decide whether a test should proceed or be delayed. The advisory panel usually issued their final weather forecast one hour before the test. It was this final forecast that determined whether a nuclear test would move forward by evaluating expected weather conditions against specific go/no-go weather criteria.

The USWB was studying close-in fallout from nuclear testing at the request of the AEC at approximately the same time. This study was expanded in 1956 and the USWB set up a permanent research station at the NNSS with a focus on assessing meteorological problems and forecast services associated with weapons and nuclear reactor testing (NVOO 1967). By 1957, USWB personnel were formally integrated into the weather advisory panel consulted during readiness briefings. Following the 1958-1961 moratorium on nuclear testing, scheduling of nuclear tests was changed from an intermittent activity to a steady state of nuclear testing on a year-round basis. Testing on a yearly schedule increased the frequency of nuclear detonations and demanded more consistent personnel and materials on hand. As a result, the USWB increased staff in 1962 to provide simultaneous support to multiple projects across the NNSS. By 1965, the USWB on the NNSS became the Air Resources Laboratory (ARL) and separated from the Las Vegas branch office of the USWB (NVOO 1967).

The weather predictions related to direction and wind velocity collected by these two agencies were of critical importance for the successful operation of nuclear tests, especially data related to blast and radiation fallout measurements. For example, between 1951 and 1957, at least 80 atmospheric tests were postponed at least once due to unacceptable weather condition predictions (NTO 1957). Weather forecasts about wind direction, clouds, and possible rainfall were also important for underground testing in case of accidental venting because they could be used to develop potential plume trajectories and dispersion models.

Starting in the 1950s and 1960s, a permanent network of weather stations was established in and around the NNSS. During an interview produced as part the Nevada Test Site Oral History Project by the University of Nevada, Las Vegas, Phillip W. Allen, a USWB meteorologist-in-charge, provided details on the instrumentation network he recalled using during his career at the NNSS. In particular, Allen recalled the use of wind instruments on 100 ft. tall towers, which provided wind direction data, and sounding balloons with attached radiosondes released near a weather station on Yucca Flat on the west side of Yucca Lake. Data from these balloons were transmitted back to the weather station approximately 30 minutes after release (Palevsky 2004a, 2004b). The weather station to which Allen referred was first established in 1960. Initially, the weather station consisted of Building 06-CP-29, a small Pascoe metal structure (Figure 1 and Figure 2), until the construction of Building 06-CP-170 (SHPO Resource # B17825) in 1965, which was built directly adjacent to it (Figure 3). Beginning in 1961, the weather station provided radiosonde observations from the sounding balloons on a daily basis at standard times during the day (Soule 2006). By 1966, observations increased to twice a day after the weather station became an integral part of the National Weather Service upper-air network, which was and still is an essential component for weather forecasting for the nation. Presumably, regularly scheduled radiosonde observations continued until the weather station was moved to Area 22 (Soule 2006). Building 06-CP-29 was used in conjunction with the larger Building 06-CP-170 as part of the Yucca Flat Weather Station until it was demolished circa 2003/2004. Only its concrete foundation remains today.

Figure 1. Building 06-CP-29, the original building at the Yucca Flat Weather Station, on the left in the early 1960s. Portable equipment and trailers owned by the U.S. Atomic Energy Commission and the U.S. Weather Bureau are on the right (courtesy of Rick Lantrip, ARL).

Figure 2. USWB meteorologist in Building 06-CP-29, June 29, 1964 (REECo 1905-5).

Figure 3. Building 06-CP-170 (at arrow) adjacent to Building 06-CP-29, March 14, 1968 (REECo 2468-13).

Between 1965 and 1978, Building 06-CP-170, also known as the tetroon inflation building, served as a critical component of the USWB's surface and upper-air observation programs (Soule 2006). Multiple types of weather balloons were inflated and deployed at Building 06-CP-170. The USWB's upper-air observation program used different types of weather balloons, including radiosonde balloons, pilot balloons, and tetroons (see Figure 4 for an example). The radiosonde balloons carried measuring instruments aloft to measure and record the physical properties of the atmosphere, pilot balloons were used to observe wind direction and speed via attached theodolites, and tetroons (balloons of tetrahedron shapes made of plastic film) were equipped with transponders to transmit information about wind direction. The radio antennae in and near Building 06-CP-170 collected telemetered information from equipment attached to these balloons. Meteorological equipment displayed these data in laboratory space in the building. The USWB staff then analyzed the raw data and provided their results during readiness briefings to the Test Panel at the Control Point. After 1978, weather observation activities were moved from Yucca Flat to the Desert Rock Weather Observatory in Area 22. The Desert Rock Weather Observatory continues operations today and provides meteorological monitoring, weather forecast services, mission-oriented research, and other meteorological support to the NNSS.

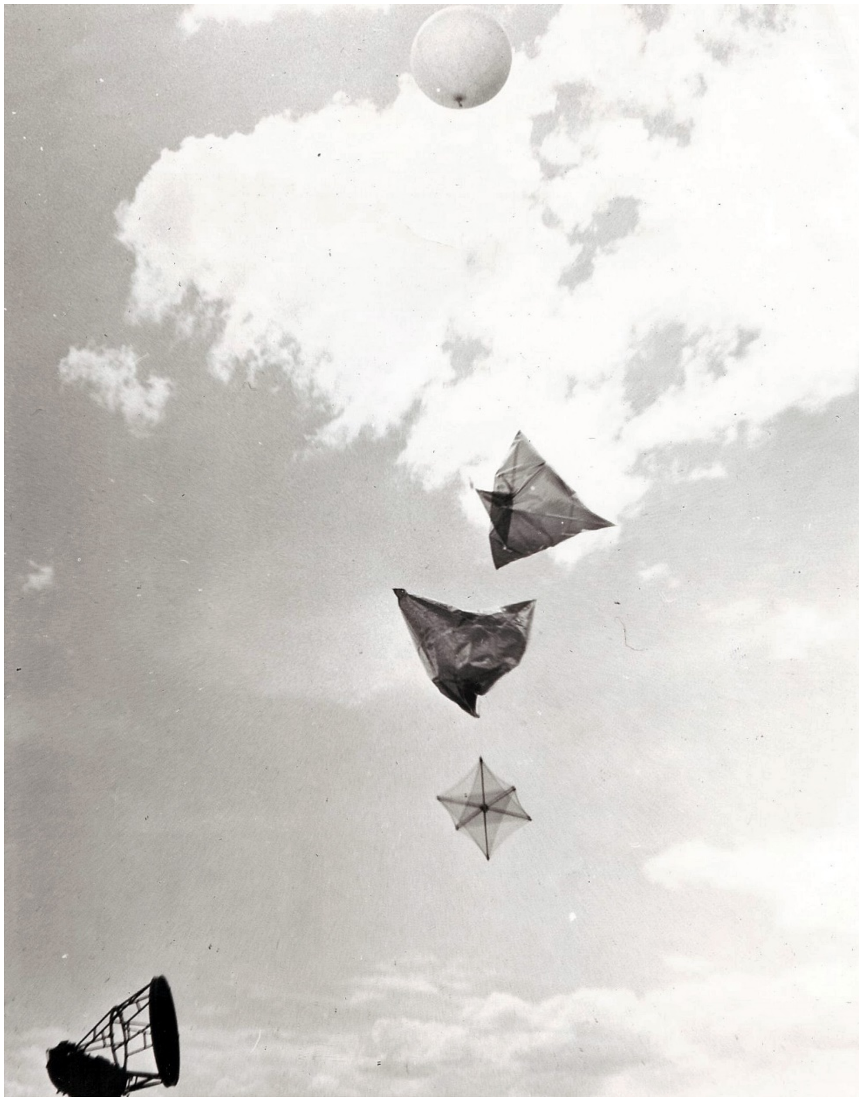

Figure 4. A tetroon balloon being released on the NNSS (courtesy of Rick Lantrip, ARL).

BUILDING 06-CP-170 ARCHITECTURAL DESCRIPTION

Building 06-CP-170 is on the west side of Yucca Lake dry lakebed and is a two-story prefabricated building (Figure 5) with a gable roof. The building is constructed of vertical and horizontal steel framing covered with corrugated metal panels on the roof and walls. A freestanding tower that supports a radome is accessible from the second story on the north side of the building (Figure 6).

Building 06-CP-170 was originally unpainted (Figure 7) but was painted light blue sometime after 2003 (Figures 8 and 9). The building has pedestrian doors on the ground level of the north, west, and east sides. Another pedestrian door opens from the second floor to an exterior platform to provide access to the radome. A pair of large sliding doors on the building's east side provides access to the two-story high bay used to inflate weather balloons. The only window in the building is set into the north elevation with an opening for a wall-mounted air conditioning unit. An air conditioning compressor sits on a pad on the southern side of the building and is connected to a metal duct that delivers air to the interior.

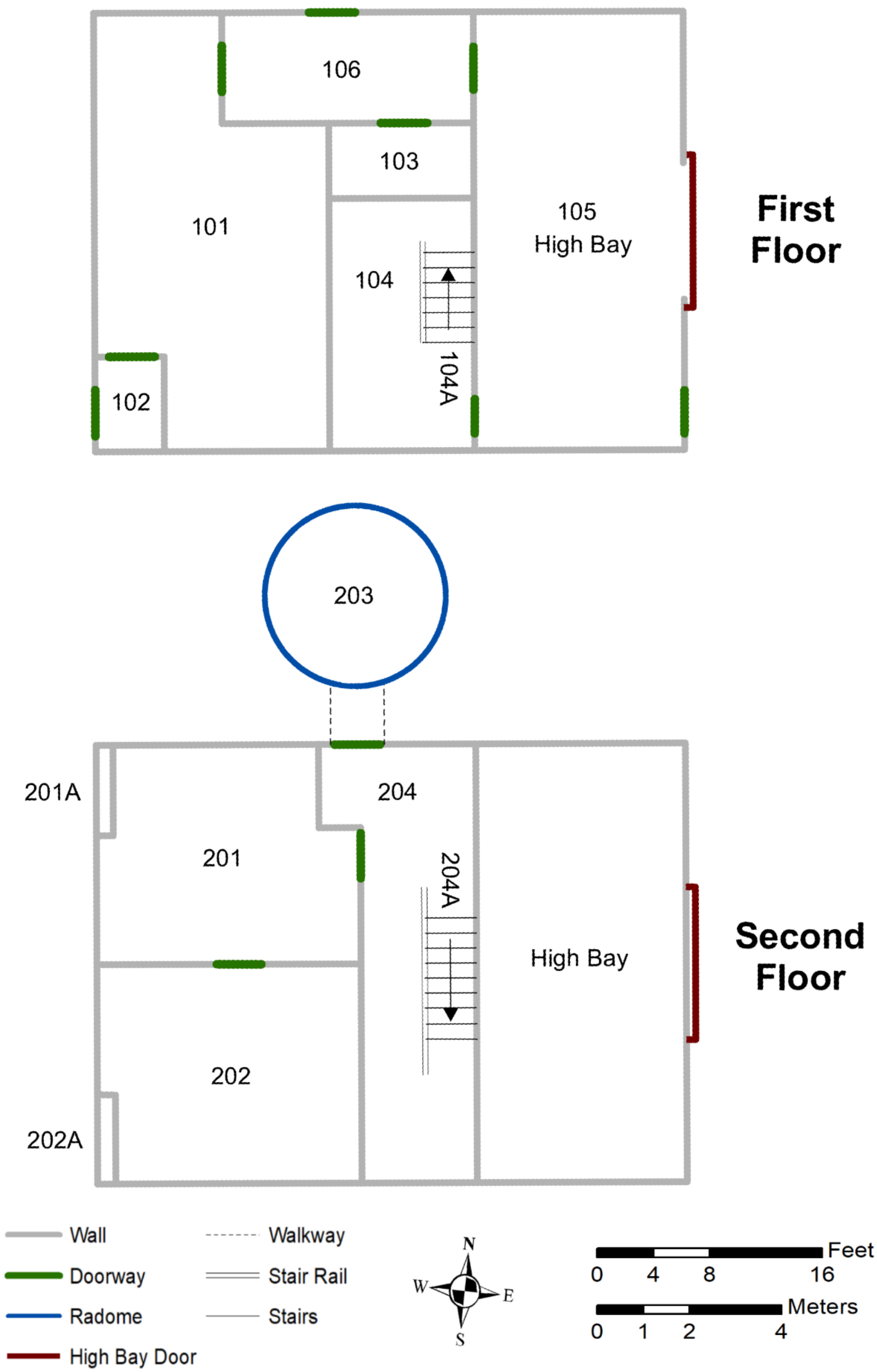

Figure 5. Floor plan of Building 06-CP-170.

Figure 6. Radome attached to Building 06-CP-170, facing west (DRI DSC_3009, 2021).

Figure 7. Building 06-CP-170 (left) and Building 06-CP-29 (right) circa 2003, facing east-northeast (courtesy of Rick Lantrip, ARL).

Figure 8. North and west elevations of Building 06-CP-170, facing southeast (DRI DSC_2989, 2021).

Figure 9. South and east elevations of Building 06-CP-170, facing northwest (DRI DSC_2984, 2021).

On the south and east sides of the building, there are concrete aprons (see Figure 9), both of which have visible remnants of weather balloon activities. On the south side of the building, bolted into the concrete apron is a yellow-painted metal stand that served as a stand for filling weather balloons with hydrogen (Figure 10). Painted on the concrete apron on the east side is a stenciled compass, which was used as a visual aide within the first minutes of an upper-air weather balloon flight (Figure 11). When paired with a theodolite, the stenciled compass would assist a meteorological technician in adjusting the tracking of a weather balloon equipped with a radiosonde released from the weather station (see Figure 11 for a historical balloon release).

Figure 10. Filling station for weather balloons on the south side of Building 06-CP-170, facing north (DRI DSC_2985, 2021).

Figure 11. Historical balloon release on the east side of Building 06-CP-170 (courtesy of Rick Lantrip, ARL) and the compass stencil on the concrete apron in the same location (DRI DSC_0165, 2018).

The first floor of the weather station consists of a laboratory (Room 101), a hallway (Room 106), restroom (Room 103), storage (Room 104), and a high bay (Room 105) (see Figure 5 for the building's floorplan). The laboratory encompasses the western portion of the first floor and is accessible through a vestibule in the southwest corner of the building. Currently, the laboratory has several sets of desks, file cabinets, office chairs with AEC property tags, a wooden desk with drawers and cutouts that previously held equipment, and a refrigerator (Figure 12). Multiple meteorological-related tools and charts are still on the laboratory tables (Figure 13). On the northern end of the laboratory is a hallway that leads to the restroom and the high bay. The restroom has a toilet and large basin utility sink. The lower halves of the walls in this room are painted the same shade of blue as the laboratory with the upper half of the walls painted white. The high bay encompasses the eastern half of the first floor. Mesh netting divides the first and second floors in the high bay and pendant lighting fixtures hang from the ceiling. Along the northern and western walls of this room are a series of steel bookcases and a small platform is at the southern end of the room (Figures 14 and 15).

Figure 12. Equipment in Room 101, facing south (DRI DSC_2950, 2021).

Figure 13. Meteorological charts and tools in Room 101 (DRI DSC_2955, 2021).

Figure 14. Room 105, shelving in high bay, facing north (DRI DSC_2945, 2021).

Figure 15. Room 105, platform in high bay, facing south (DRI DSC_2942, 2021).

In the center of the first floor is a storage room containing equipment related to the building's water and sprinkler system, as well as a stairwell that leads into a hallway on the second floor (see Figure 5). A water tank is at the south end of this hallway, and a small workstation with a swivel chair (Figure 16) and a door that leads to the radome platform are on the north side of the building. The door that leads to the radome is locked and the condition of the platform and radome is not currently known. The hallway also leads to two laboratories in the western section of the building (Room 201 and 202). Room 201 has a built-in counter on the north and west walls and several file cabinets (Figure 17). Room 202 has office equipment and several filing cabinets (Figure 18).

Figure 16. Second floor hallway, showing water tank facing south (DRI DSC_2965, 2021) and workstation with swivel chair facing north (DRI DSC_2967, 2021).

Figure 17. Built-in counter in Room 201, facing north (DRI DSC_2976, 2021).

Figure 18. Office equipment in Room 202, facing west (DRI DSC_2972, 2021).

BUILDING 06-CP-170 CURRENT CONDITION

The exterior of the building generally remains in good condition. The interior of the building has damage from animal occupation. Throughout the entire building's interior, there is obvious rodent infestation and there is evidence of nesting birds in the high bay. The radome was inaccessible and its condition is not known. Three accessory resources (AR1-AR3) were previously recorded and are in similar condition as their original recording. Seven additional resources were identified during the current effort (Figure 19). These accessory resources are all related, subordinate resources to Building 06-CP-170 and are described below.

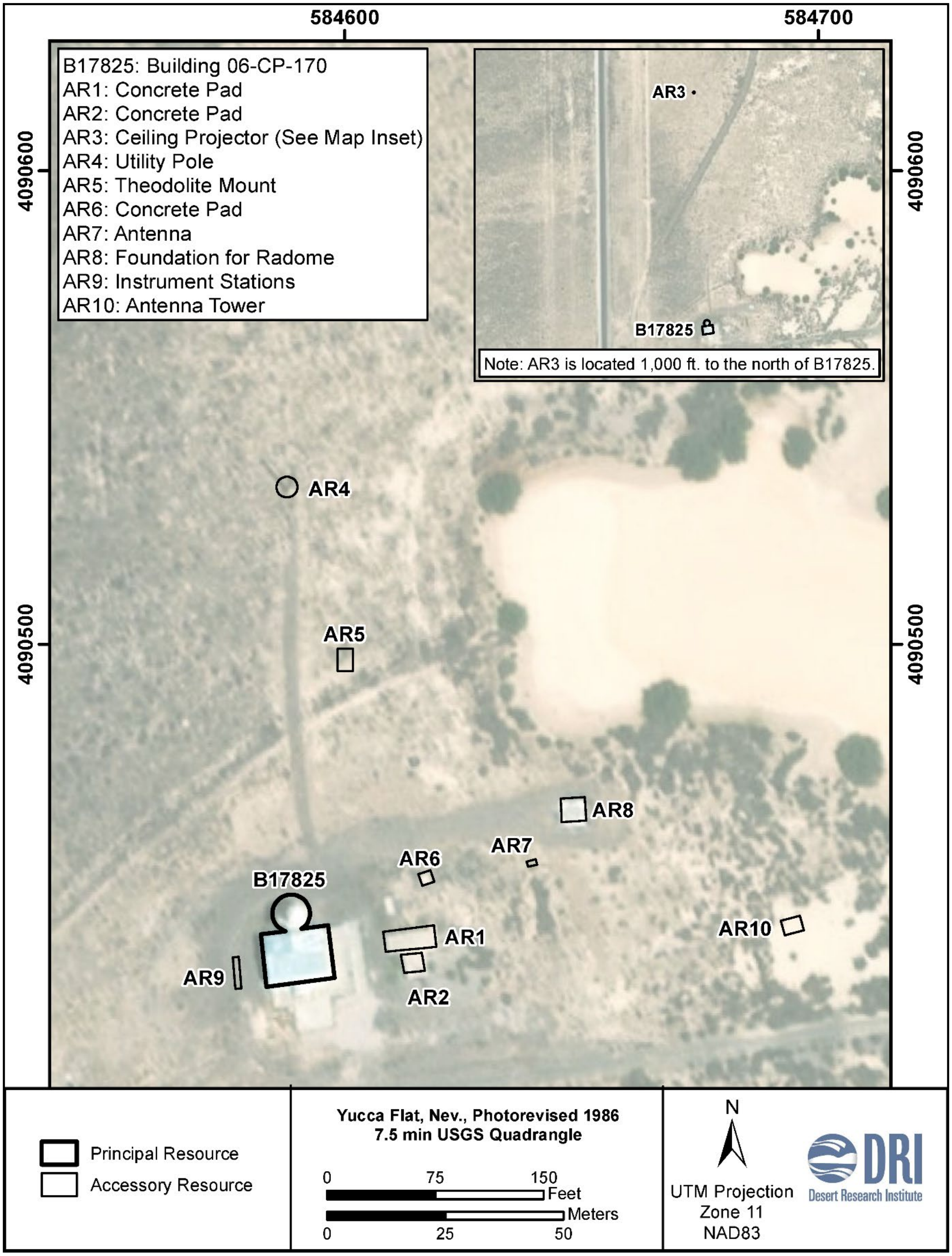

Figure 19. Plan map of Building 06-CP-170 and its accessory resources.

AR1, Concrete Pad: This is a concrete pad (Figure 20) located directly east of Building 06-CP-170. A construction drawing with an as-built notation dated January 10, 1966 (Hendricks and Associates 1965), shows the pad just north of a rawinsonde station pad (AR2 detailed below). The pad and a telephone connecting stand are the only extant features. The historical function of this accessory is currently not known.

Figure 20. AR1, concrete pad, facing southwest (DRI DSC_3005, 2021).

***AR2, Concrete Pad*:** This concrete pad (Figure 21) is adjacent to AR1. Construction drawings indicate this accessory supported a radome station for weather balloon tracking. The station is shown in a set of historical photographs dated June 29, 1964 (see Figure 22 for an example). A second set of historical photographs from March 14, 1968 (REECo 1982, photos 2648-13 through 16), indicate the station had been removed by then and the pad was being used for equipment staging. This might have been due to the construction of the larger radome tower attached to Building 06-CP-170 or another instrument station constructed to the northeast (see AR8). Currently, the outline of the dome-shaped station remains. Electrical connector boxes on a free-standing frame are adjacent to the pad.

***AR3, Ceiling Projector*:** This ceiling projector (Figure 23) was manufactured by Westinghouse Electric Corporation and is stamped with a USWB serial number and an AEC inventory tag. The ceiling projector acted as a searchlight to project a narrow, high-intensity beam of light upwards to measure a cloud's altitude (i.e., the ceiling). To create this beam of light, a high wattage lightbulb inside the projector was placed between two mirrors. The top mirror reflected light down and the second mirror reflected light toward the cloud. Heights were determined with the aid of an alidade or a theodolite, generally positioned 1,000 ft. away from the ceiling projector. These tools measured the point at which the light beam touched the cloud and provided an exact altitude in feet. A theodolite mount (AR5) is positioned approximately 840 ft. south of AR3.

Figure 21. AR2, concrete pad, facing northwest (DRI DSC_0184, 2018).

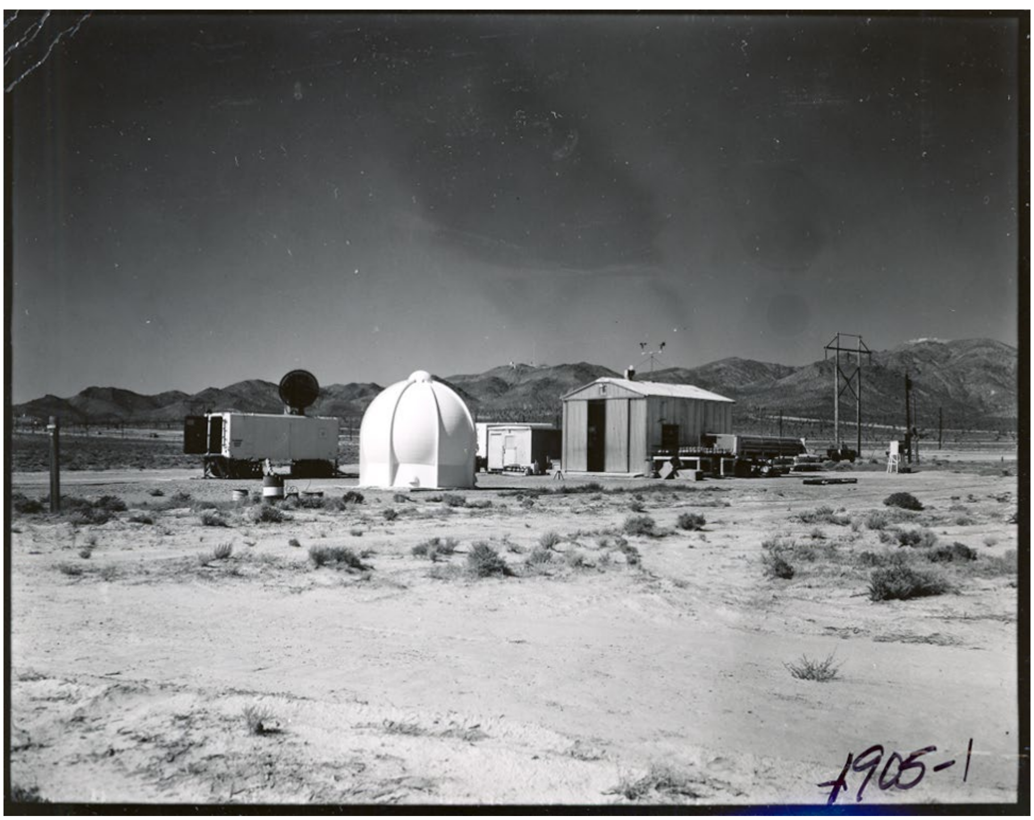

Figure 22. Radome station, June 29, 1964 (REECo 1905-1).

Figure 23. AR3, ceiling projector, facing east (DRI DSC_5549, 2018).

AR4, Utility Pole with Instrumentation: This is a 35 ft. tall wood utility pole (Figure 24) located 300 ft. to the north of Building 06-CP-170 installed prior to 1968, as it appears in a set of historical photographs dated March 14, 1968 (see Figure 3). According to Rick Lantrip, a meteorological technician for the ARL, the type of instrumentation currently mounted on the top of the pole is a target antenna. This antenna was used during pre-launch checks when meteorologists were using the Microcomputer Automatic Radio Theodolite (Micro-ART) system, which has been in use since the 1980s. When energized, the antenna emitted a steady tone that the Micro-ART system locked onto, which ensured that electronics were warmed up and could track a radiosonde on balloons. The type of instrumentation previously mounted on the utility pole is not currently known. Presumably, past instrumentation served a similar purpose with regard to balloon tracking.

AR5, Theodolite Mount: This theodolite mount consists of a metal pole secured on a concrete pad, sheltered on all four sides by a square metal and wood enclosure (Figure 25). On the south side of the shelter are circuit and powerboxes. On the interior of the shelter is another powerbox and a switch box.

The main purpose of this enclosure and mount was to support an optical theodolite, which served several functions in support of Building 06-CP-170. First, the optical theodolite was used in conjunction with the ceiling projector (AR3) so that an observer could measure the height of the base of the cloud layer directly above the ceiling projector to calculate the ceiling height. After the ceiling was calculated, a standard chart for ceiling height was consulted and the data were used in official observations. Second, the optical theodolite was used to manually track pilot balloons (PIBAL) by logging the azimuth and elevation every minute. The PIBAL would provide wind direction and speed every 1,000 ft. as long as the balloon could be visually tracked. Figure 26 shows a historical photograph of the mount enclosure.

Figure 24. AR4, utility pole with instrumentation, facing north (DRI DSC_2993, 2021).

Figure 25. AR5, theodolite mount enclosure in 2021, facing east (DRI DSC_2995, 2021).

Figure 26. AR5, theodolite mount enclosure, March 22, 1972 (courtesy of Rick Lantrip, ARL).

AR6, Concrete Pad with Power Box: This is a square, rough-finished concrete pad (Figure 27). A powerbox is mounted on a metal frame on the west side of the pad. The pad does not appear on historical engineering drawings. However, historical records available to Rick Lantrip (ARL) indicate an F420c wind speed and direction sensor was installed at Building 06-CP-170. Therefore, this pad likely held a wind tower with a prop and vane mounted on it because the location, wiring, and bolt patterns are consistent with this type of equipment. This equipment would have been wired directly into the building and produced an F420c sensor readout, which provided information on wind speed and direction.

Figure 27. AR6, concrete pad with power box (DRI DSC_0039, 2021).

AR7, Antenna on Wooden Post: This antenna and power box mounted on a wood post (Figure 28) likely served a radio telemetry purpose in support of Building 06-CP-170, but its exact function is not known.

Figure 28. AR7, antenna on wood post, facing southwest (DRI DSC_0040, 2021).

AR8, Foundation for Radome: This square concrete foundation (Figure 29) has a circular outline that indicates a radome station was previously installed. However, the radome does not appear on any historical engineering drawings for Building 06-CP-170, suggesting it may have initially been installed to support Building 06-CP-29. After the construction of Building 06-CP-170, the radome station likely was used in conjunction with radio theodolites mounted on trucks and on the ground around the building and across the NNSS. Historical photographs (REECo 1982, photos 2648-13 through 16) show the station was in place by March 14, 1968. The radome was removed sometime in the late 1990s or early 2000s (Scammell 2005:38). Currently, the foundation has mounting bolts, cabling, and several powerboxes.

Figure 29. AR8, foundation for radome, facing west (DRI DSC_2999, 2021).

AR9, Instrument Stations: These are the remains of 1) a Belfort Universal Weighing Rain Gauge and 2) meteorological instruments in a Stevenson screen (Figure 30). The rain gauge was installed on February 12, 1971. The date at which the Stevenson screen was installed is not known. A historical photograph dated March 22, 1972, shows how these two instrument stations previously appeared adjacent to Building 06-CP-170 (Figure 31). The stations were in place as late as 2004.

Figure 30. AR9, remains of rain gauge (left) and Stevenson screen (right) (DRI DSC_0045 and DRI DSC_0082, 2018).

Figure 31. AR9, instrument stations, March 22, 1972 (courtesy of Rick Lantrip, ARL).

AR10, Antenna Tower: This antenna tower (Figure 32) is stationed on a wheeled trailer. It is a triangular lattice tower made of tubular steel. The tower is supported by guywire stanchions and additional steel anchors and is powered by a box located on the south side of the tower. Records provided by Lantrip (ARL) indicate the tower was designated MEDA 6 and that it functioned as an autonomous weather station that collected weather data every 15 minutes and transmitted observations via radio telemetry. The date of installation of this tower is not known, but similar towers were installed as early as the 1960s.

Figure 32. AR10, antenna tower, facing north (DRI DSC_0043, 2021).

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APPENDIX A

Cultural Resource Forms

Architectural Resource Assessment Forms:

SHPO Resource No. B17825, 06-CP-170, Update 1*

SHPO Resource No. B17825, 06-CP-170, Original*

*On file at Desert Research Institute, Las Vegas; the Nuclear Testing Archive, Las Vegas; and the Nevada State Historic Preservation Office.

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