

US Army Corps of Engineers Rock Island District



Defense Environmental Restoration Program For Formerly Used Defense Sites Ordnance and Explosives

# Archives Search Report

## FINDINGS

for the former

# CAMP DESERT ROCK

MERCURY, NEVADA Project Number J09NV027601

June 1996



## DEFENSE ENVIRONMENTAL RESTORATION PROGRAM

for FORMERLY USED DEFENSE SITES

#### FINDINGS

ORDNANCE AND EXPLOSIVES ARCHIVES SEARCH REPORT for the former CAMP DESERT ROCK MERCURY, NEVADA PROJECT NUMBER J09NV027601

June 1996

Prepared For U.S. Army Engineering and Support Center, Huntsville ATTN: CEHNC-OE P.O. BOX 1600 Huntsville, Alabama 35807-4301

> Prepared By U.S. Army Corps of Engineers Rock Island District ATTN: CENCR-ED-DO P.O. Box 2004 Rock Island, Illinois 61204-2004

> > and

U.S. Army Defense Ammunition Center and School ATTN: SIOAC-ESL Savanna, Illinois 61074-9639

## ORDNANCE AND EXPLOSIVES ARCHIVES SEARCH REPORT for the former CAMP DESERT ROCK MERCURY, NEVADA PROJECT NUMBER J09NV027601

The	following p	ACKNOWLEDGMEI ersons provided a	NT support as i	ndicated.
Function	Name	Title	Organization	Telephone
On-site Assessment	*Michael La Forge	Q.A. Spec., Ammunition (QASAS)	SIOAC-ESL	(815)273-8762
	Nick Iaiennaro	UXO Safety Spec.	CENCR-ED-DO	(309)794-6056
	Michael Patterson	Q.A. Spec., Ammunition (QASAS)	SIOAC-ESL	(815)273-8763
Engineering Support	Daniel J. Holmes	Professional Engineer	CENCR-ED-DO	(309) 794-5480
Technical Records Search	Tom Meekma	QASAS	SIOAC-ESL	(815)273-8739
Geographic District Support	Gregory H. Boghossia	Project n Manager	CESPL-ED-MI	(213)894-3574
Industrial Hygiene	Bob Platt	Industrial Hygienist	MCXP-RIA	(309)782-0806
CADD	Jeff McCre	ry Technician	CENCR-ED-DO	(309) 794-6003
*Team Leader				

## ORDNANCE AND EXPLOSIVES ARCHIVES SEARCH REPORT for the former CAMP DESERT ROCK MERCURY, NEVADA PROJECT NUMBER J09NV050801

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## ORDNANCE AND EXPLOSIVES ARCHIVES SEARCH REPORT For the former CAMP DESERT ROCK MERCURY, NEVADA PROJECT NUMBER J09NV027601

#### 1. INTRODUCTION

## a. Subject and Purpose

(1) This report presents the findings of an historical records search and site inspection for ordnance and explosives (OE) presence located at the former Camp Desert Rock. The investigation was performed under the authority of the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP FUDS).

(2) The investigation focused on 23,058.18 acres of land that was used by the Army as an equipment staging area and troop billets for troops involved in training exercises associated with atomic weapons testing. Approximately 320 acres of this land was used as a cantonment area.

(3) The purpose of this investigation was to characterize the site for potential OE contamination, to include conventional ammunition and chemical warfare material (CWM). The investigation was conducted by experienced ordnance experts through thorough evaluation of historical records, interviews, and on-site visual inspection results.

## b. Scope

(1) This report presents the site history, site description, real estate ownership information, and confirmed ordnance presence (prior to and after site closure), based on available records, interviews, site inspections, and analyses. The analyses provide a complete evaluation of all information to assess current day potential ordnance contamination, where actual ordnance presence has not been confirmed.

(2) For the purpose of this report, OE contamination consists of live ammunition, live ammunition components, CWM, or explosives which have been lost, abandoned, discarded, buried, fired or thrown from demolition pits or burning pads. These items were either manufactured, purchased, stored, used, and/or disposed of by the War Department/Department of Defense. Such ammunition/components are no longer under accountable record control of any DOD organization or activity. (3) Expended small arms ammunition (.50 cal or smaller) is not considered OE contamination. OE further includes "explosive soil" which refers to any mixture in soil, sands, clays, etc., such that the mixture itself is explosive. Generally, 10 percent or more by weight of secondary explosives in a soil mixture is considered explosive soil.

#### 2. PREVIOUS INVESTIGATIONS/PROJECTS

## a. 1994 Preliminary Assessment

(1) A Preliminary Assessment of Camp Desert Rock was conducted under the Defense Environmental Restoration Program, Formerly Used Defense Sites (DERP FUDS) by the Corps of Engineers, Los Angeles Division (see reference B-1). At that time, the Findings and Determination of Eligibility (FDE), dated 26 August 1994, concluded that 23,058.18 acres had been formerly owned or used by the Army/Department of Defense.

(2) The FDE concluded that there were eligible categories under the DERP/FUDS program. Since the site was found to have been used as a staging area for maneuvers, an Ordnance and Explosives (OE) project was recommended, DERP FUDS Project Number J09NV027601, which is the subject of this report (see document E-3).

	DERP-FUDS P	TABLE RELIMINARY	2-1 ASSESSMENT PROJI	SCTS
Project Number	DERP Category	Present Phase	Comments	Location
J09NV027601	OE	SI	Ordnance and Explosives	See plate 2
	BD/DR	-	None Recommende	ed
	HTRW	-	None	

## b. Other Investigations

No other investigations or studies relevant to DERP-FUDS were discovered during this Archives Records Search.

## 3. SITE DESCRIPTION

## a. Existing Land Usage

(1) The former Camp Desert Rock is located in Nye County, southwest of Mercury, Nevada.

(2) The property is used by the Department of Energy Nevada Test Site (NTS) for an airport and by the National Weather Service for a recording station.

TABLE 3-1					
		CI	URRENT LAND USAG	E	
AREA	FORMER	PRESENT	PRESENT	SIZE/	COMMENTS
	USAGE	OWNER	USAGE	ACRES	
А	Buried	DOE	Airstrip	0.25	See plates 4,5
	Mines		Weather Stat	ion	
	• • • • • • •				
в	Dump Area	DOE	HTRW Site	0.25	See plates 4,5
_	<b>-</b>				
с	Staging	BLM	Wildlife	658.18	See plates 4,6
	Area		Mgmt.		
D	Ammunition	DOE	Environment	0.25	See plates 4,5
	Storage		Research		
Е	Radiation	DOE	Not Used	0.25	See plates 4,5
	Dump				
					Coo plator 4 6
F	Remaining	DOE	Not Used	22,399.0	See praces 4,0
	· · · · · · · · · · · · · · · · · · ·		metal Agrees	22 059 19	
			TOTAL ACLES:	23,030.10	

(3) Table 3-1 shows current land usage.

## b. Climatic Data

(1) Material in paragraphs 3.b.(2) through (4) was extracted from the Local Climatological Data, Annual Summary With Comparative Data for Las Vegas, Nevada, dated 1993 (see reference B-10).

(2) Nye County is located in the southwestern portion of the state. Weather factors for the Las Vegas recording station are used in this assessment. The factors that determine weather patterns include location of Nevada on the eastern, lee side of the Sierra Nevada Mountains, prevailing winds from the west that drop precipitation on the western side of the Sierras, and wild local variations due to differences in topography and elevation. (3) The annual precipitation averages 4.21 inches (1964-1993 avg. mean). The wettest months are usually March and January. The months with the least amounts of precipitation are May and June (see reference B-11).

(4) The average temperature ranges from daily minimums in January and December of 32.7 to 33.6° F to daily mean high temperatures of 83.5 to 89.8° F in June, July, and August. The lowest temperature observed was 8°F in January and the highest temperature was 116° F in July (see reference B-14). Mean number of days with temperatures over 90° F is 132. Mean number of days 32° F and below is less than one-half (see reference B-11).

(5) The average snowfall each winter is from a trace to up to 16.7 inches. The relative humidity averages from 21 to 40 percent throughout the course of the day (see references B-10 and B-11).

(6) Flooding, especially flash flooding, is likely to occur in the area of the site after thunderstorms due to the topography and soil consistencies (see reference B-11).

## c. Topography

(1) Nye County lies on the southwestern edge of the state and is part of the southwest edge of Pahute Mesa, a large plateau. Average elevations in the area of the site are from 3,000 to 7,800 feet. The area slopes down gently southwest towards the Amargosa Desert and Death Valley. The most distinctive topological structures of the site are long sloping foothills for the mountainous areas on the Nevada Test Site.

(2) The site is traversed by gullies, canyons, and arroyos making transportation diffucult.

#### d. Geology and Soils

(1) Material in paragraphs 3.d.(2) and 3.d.(3) was extracted from several sources as a current Soil Survey of Nye County, Nevada was not available (see references B-2 and B-11).

(2) Regional Geology/Soils

(a) The geology of Nye County is generally categorized as structurally complex due to intense crustal deformation. Large, deep formations of dolomite and limestone from the early Cambrian to the early Permian are present, with the balance of the underlying formations being conglomerate, quartzite, and shale beds. The Tertiary rock in the mountains ringing the site area are mainly rhyolite and tuff but include many other igneous types. Near the base of these formations, Tertiary rocks are interbedded with layers of conglomerate and marly limestone. The valley floors that make up the center of the site are quarternary in nature, made up of a detritus from the bedrock areas carried by intermittent flash flooding to the margins of valleys and alluvial fans. Larger amounts of coarse debris are deposited along the edges of dry watercourses. Dry lakebed playas are made of fine silt and clays (see references B-2 and B-11).

(b) The soil is of all sizes of rock debris ranging from clay-sized fragments to boulders. The soil is not suited for agricultural purposes and lack of water kills all but the hardiest desert shrubs.

(3) Site Specific Geology/Soils

Soils on the site are basically derived from weathered sandstone, limestone, and dolomite known as caliche. Caliche is a hard top or near top soil conglomerate held together by calcium carbonates from weathered limestone and dolomite. Particles in the caliche are from weathered sandstone and fractured volcanic rock from the many igneous intrusions in the area. The resulting soil is very hard to penetrate, nearly impervious to water where undisturbed, and highly porous where it has been disturbed, such as in mining, flood plains, or quarry areas (see references B-2 and B-11).

## e. Hydrology

The 4.21 inch average rain fall for the Las Vegas area is not a reliable estimate for this area due to altitude and proximity of the Amargosa Desert (see reference B-11). Surface water on this site is mainly runoff from the mountainous areas to the north and northwest of the site. Small springs and seeps are located in several places on the site but these are largely seasonal and provide no steady supply of water.

## f. Natural Resources

(1) There are several endangered animals and plants listed as endangered species to be protected in this portion of Nevada by the Department of the Interior, U.S. Fish and Wildlife Service (see reference B-9).

(2) The following species are recognized as threatened, endangered or sensitive by the State of Nevada or by the Federal Government and are presented in tabular form in table 3-2:

	TABLE 3-2 NATURAL RESOURCES <sup>*</sup>	
Resource Classification	Туре	Comment
Mammal	None	
Bird	None	
Amphibian/Reptile	Desert Tortoise Amargosa Toad	E (F,N) T (F)
Fish	Pahrump Poolfish Warm Springs Pupfish	E (F) E (F)
Plant	Amargosa Niterwort Mojave Sweet Pea	E (F) S (F)
Insect	None	
E = Endangered S F = Federal I *References B-9 and E	S = Sensitive    T= Threatened N = Nevada 3-13	

## g. Historical/Cultural Resources

According to the State Historical Preservation Office (SHPO) for Nevada, maintenance of an inventory of historic and cultural sites is contracted to the University of Nevada at Las Vegas' Harry Reid Center for Environmental Studies. Ms. Blair of that office informed the HRS researcher for this site that the least expensive and most feasible way to inventory and categorize historical/cultural sites was to do so after it had been determined which areas are to be remediated. No information specific to the site was discovered, however, when remediation is considered for this site, the SHPO should be contacted for specific guidance (see appendix A, Reference sources).

#### 4. HISTORICAL ORDNANCE PRESENCE

## a. Chronological Site Summary

(1) The site was acquired from the Department of the Interior as part of a 4,043,339.55 tract specified in Executive Order 8578, 29 October 1940, for use as a bombing and gunnery range (see reference G-1). 733,418.44 acres were relinquished to the Atomic Energy Commission by Presidential order in 1950, which included the 23,058.18 acres which are the subject of this report (see reference G-6). The site was used for billeting troops and storage of equipment incidental to atomic battlefield maneuvers conducted in conjunction with the atomic weapons testing program (see references F-2 and F-4). With the suspension of aboveground testing in 1957, the camp was discontinued as a subinstallation in 1965 (see reference F-5). The major portion of the site is owned by the Department of Energy, which uses the property for environmental research an airstrip and as a buffer zone between the Nevada Test Site and Highway 95.

(2) The former Camp Desert Rock was overflown by aircraft training in flexible gunnery during World War II from December 1941 to 1949, but was not used for air-to-ground gunnery or bombing due to its proximity to Interstate 95 (see interview I-5).

(3) The former Camp Desert Rock was area was also used by troop units from across the United States during several atomic weapons tests in the 1950s (see reference F-1). Troop involvement in the tests was to simulate combat on the atomic battlefield using a wide variety of infantry and infantry support weapons including medium artillery (see reference F-2). At the completion of the exercise, weapons and equipment would be decontaminated along with the troops prior to returning to Camp Desert Rock (see references H-1 through H-4 and F-4).

## b. Ordnance Related Records Review

(1) Sources checked in the search for any OE contamination included:

- [a] National Archives
- [b] Regional Archives
- [c] The Military History Institute
- [d] U.S. Army Center for Military History
- [e] Emergency Ordnance Disposal (EOD) Units
- [f] Local Police Department
- [g] Local Sheriff's Department
- [h] County Courthouse

(2) For a complete list of sources checked, see appendix A, Reference Sources.

(3) Documentation discovered in the course of the Archives Search showed that the former Camp Desert Rock was the billeting area for troops taking part in atomic battlefield maneuvers during atomic weapon testing (see references F-1 through F-5). No documentation was discovered that indicated any usage as a bombing and or air-to-ground gunnery range. This was verified with interviews with personnel familiar with the site (see interviews I-2, I-3, and I-5). (4) Libraries and archives were carefully searched for documents and articles specific to Camp Desert Rock; several were discovered and are catalogued in appendices F, G and H. Supporting EOD units have made no recoveries of munitions or ordnance items in this area (see interviews I-3 and I-4). The DOE contractor on-site for many years operated their own explosive ordnance disposal team. This contractor is no longer associated with Nevada Test Site and no records of recovered and rendered safe OE items was available (see interviews I-6 and I-7).

(5) Review of newspaper microfilm, clipping files, and vertical files at the Nevada Room of the Las Vegas Central Library revealed no evidence of the discovery of OE at the former Camp Desert Rock.

(6) No range clearance documents were discovered in the course of the Archives Search. This area was searched very thoroughly by DOE contractor personnel for evidence of USTs, OE, and HRTW (see reference E-4). No OE was noted during these searchs except as noted in Area A.

(7) Documents concerning troop deployments for atomic battleground maneuvers and testing of ammunition were recovered and are cataloged in appendix F. They indicate that troops were deployed from units across the United States to simulate training after an actual atomic explosion. The troops were billeted at and staged from Camp Desert Rock.

## c. Interviews with Site Related Personnel

(1) Mr. Boto is, in addition to being the owner/operator of Oasis Valley Souvenirs, a volunteer with the Nye County Search and Rescue Team which has provided support in the past for the Nevada Test Site. He has traveled, responded, and practiced Search and Rescue techniques extensively in the Camp Desert Rock area with vehicles, helicopters as well as on horseback. He is familiar with ammunition and ordnance items but has never encountered OE in the area and was not aware of injuries or damage to property due to ordnance or explosives incidents (see interview I-1).

(2) Mr. Daily is the Range manager at the Indian Springs Auxiliary airfield, the nearest point to Camp Desert Rock where live munitions are utilized by the Air Force. He was aware that Camp Desert Rock had been formerly used and but had no recollection of any accidents or incidents attributable to OE in the surrounding area (see interview I-2).

(3) CPT Swoboda, Nellis AFB EOD, had no information on the discovery of OE at the former Camp Desert Rock or any knowledge of its use as a bombing range at any time. The proximity of the highway would have prohibited its use as anything except a buffer area. His unit does the range clearances on the active portions of the Nellis Range and would be the responders if ordnance was discovered in/on DOE/BLM lands, like Camp Desert Rock, that border the active Range today. The incidence of munitions inadvertently being dropped off range is estimated to be .005 objects per 1,000 sorties. The average number of sorties per year at Nellis and the surrounding airspace is 60,000 per annum, increasing to 72,000 by the year 2000. The current annual armament drop rate is .3 and should be .36 in the year 2000. Any incidence of ordnance discovery/recovery would not be covered by FUDS funding but by Base Operations funding. He stated that armaments dropped off-range would be recovered by Nellis ordnance personnel (see interview I-3).

(4) SSG Quinn, 259th EOD, Fort Irwin, was the staff duty NCO. SSG Quinn had no information on discovery or removal of ordnance and munitions items in the former Camp Desert Rock area. He acknowledged that his unit does have responsibility for the area in which Camp Desert Rock is located but, in practice, leave finds of Air Force munitions for the Air Force's disposition. He suggested I speak with Air Force EOD personnel and gave me a POC (see interview I-3). He had no other pertinent information (see interview I-4).

(5) Dr. Wilman is the Staff Historian for Weapons Training Center at Nellis Air Force Base and is very familiar with all aspects of the Nellis Range Complex and the Nevada Test Site. She was not familiar with any instances of ordnance or munitions being discovered in the Mercury area where Camp Desert Rock is located. She has intensively searched the archives for us in this respect after prior coordination with the HRS team. Her feeling was that the Camp Desert Rock was a flyover area for air-to-air gunnery: due to its proximity to Highway 95 air-to-ground gunnery and bombing range usage would have been too dangerous (see interview I-5).

(6) Mr. Lipstate is presently responsible for all explosives handling on the Nevada Test site to include procurement, storage, and destruction. He has only been at the site since Bechtel took over the contract in 1995. He said that he has found plenty of expended small arms ammunition on the dry lake beds in the classified portions of the site but has not had to respond to any discoveries of OE anywhere on the site to include Camp Desert Rock. He said most of their explosive destruction is to eliminate explosive assemblies and scrap explosive from various classified weapons programs not associated with this site. Mr. Lipstate also noted that all excavation projects are conducted in such a manner as to ensure that the discovery of hazardous material, including OE, is reported and dealt with immediately. He said they treat the entire site as having the potential for one sort of contamination or another (see interview I-6).

(7) Mr. Beam worked on the Nevada Test Site from 1967 to 1994 disposing of waste ordnance. Much of the ordnance, both exploded (fragments) and unexploded was the result of military maneuvers conducted by troops billeted at Camp Desert Rock. This was his sole responsibility for REECO and was later expanded to the destruction of explosive scrap and assemblies from atomic weapons testing. The areas where most of the OE was discovered during his 26 years at the test site were in NTS areas 1, 5, 7, 9, 10, 17, 18, 19, and 20. These areas are <u>not</u> encompassed within the boundaries of the former Camp Desert Rock which is referred to as Area 22 on NTS maps. He did not recall recovering any HE or energetic loaded items in his last three years of employment (see interview I-7).

(8) Mr. Cook is currently an employee of the Bureau of Land Management in Las Vegas and is quite familiar with the property in question at the former Camp Desert Rock. He has visited the property several times in the course of his duties and has never seen any evidence of OE in the area. He is familiar with OE from his time in the military and spoke knowledgeably about military activities in the surrounding areas including other FUDS sites now under study (see interview I-8).

#### 5. SITE ELIGIBILITY

#### a. Confirmed Formerly Used Defense Site

(1) Former land usage by the Army was previously confirmed for the entire 23,058.18 acre site as summarized in section 4 of this report.

(2) There are no recapture or restricted use documents on record for Camp Desert Rock.

## b. Potential Formerly Used Defense Site

No previously unknown potential Formerly Used Defense Sites were identified by the site inspectors during the course of the visual inspection and review of historical documents.

#### 6. VISUAL SITE INSPECTION

#### a. General Procedures and Safety

(1) During the period 12-21 February 1996, members of the Site Inspection (SI) team traveled to Nevada to assess several FUDS including the former Camp Desert Rock. The primary task of the SI team was to assess OE presence and potential due to the usage of the site as a billeting and staging area for troops training in conjunction with atomic weapons testing conducted by DOE. (2) A site safety plan was developed and used by the SI team to assure an injury-free site inspection of the Former Camp Desert Rock. A briefing was conducted prior to the SI which stressed that OE would only be handled by military EOD personnel. Site safety and strict adherence to nonintrusive investigation methods were maintained by the inspection team at all times during the on-site inspection.

(3) Prior to the site visit, a thorough review was made of available reports, historical documents, texts, and technical ordnance manuals (see materials referenced in Appendix A gathered during the ASR historical records search). This review was made to ensure team awareness of potential ordnance types and hazards.

(4) The actual inspection of the former Camp Desert Rock began on 13 February 1996, when the SI team visited the site (see plate 1).

## b. Area A: Buried Land Mines

(1) The site was surveyed with the aid of a 4-wheel-drive vehicle, a GPS device, magnetometer, and existing maps and drawings.

(2) The SI team first surveyed the portion of the site indicated as a potential ammunition burial site by the INPR. This survey was conducted on foot with all appropiate cautions taken to avoid injury and heat fatigue. Partially buried and completely uncovered M12 practice land mines, unfuzed, were noted in this area. The mines appear to have been buried to dispose of them rather than following standard turn-in procedures. Magnetometer readings indicated the presence of more metallic items buried beneath those which were visible (see plates 4 & 5, and photographs J-2 and J-3).

## c. Area B: Landfill Area

This was noted on the INPR and is a large ditch topped with stone (see photograph J-4). There was no evidence of OE noted in this area, but the landfill is marked with a pole designating it as NTS HTRW site 22-19-04 (see plates 4 & 5).

## d. Area C: Staging Area

The SI team surveyed this portion of the site southeast of the main cantonement area (see plate 4). A map obtained during the research labeled this area as convoy assembly area. This area is a large wide open windswept area with no evidence of structures or facilities. No OE was noted on this site by the assessment team. No Army improvements appeared to have made in this area.

## e. Area D: Ammunition Storage Area

This area, south of the weather station showed no evidence of OE with the exception of rusted steel 1/4" strapping commonly used for securing ammunition boxes (see plate 5 and photograph J-5). There was no fencing or sandbagging visible. No structures, electrical improvements or provisions for firefighting common to a long-term ammunition storage area were apparent. No burning ground or demolition area was noted. Magnetometer sweeps were negative.

## f. Area E: Radiation Dump

This area southsouthwest of the weather station had no evidence of OE (see plate 5). There was no evidence of facilities for long term storage, firefighting or electrical improvement required for long term radioactive storage. There were no structures in this area. Magnetometer sweeps were negative.

## g. Area F: Remaining Land

(1) This area was surveyed on foot and by automobile. As a portion of this area is on the Nevada Test Site, cameras and recording devices such as GPS and tape recorders are prohibited. Accordingly, this area is not depicted in Appendix J. No OE was noted in this area by the team. No conventional cratering or trenching was noted in this area. No targets, range facilities, or Army improvements were noted here.

#### 7. EVALUATION OF ORDNANCE HAZARDS

## a. General Procedures

(1) The site was evaluated to determine confirmed, potential, or uncontaminated ordnance presence. Confirmed ordnance contamination is based on verifiable historical evidence or direct witness of ordnance items. Verifiable historical records evidence consists of ordnance items located on site and documented by the local bomb squad, Air Force and Army Explosive Ordnance Disposal teams, newspaper articles, correspondence, current findings, etc. Direct witness of ordnance items consists of the inspection team directly locating ordnance items by visual inspection. Additional field data is not needed to identify a confirmed subsite.

(2) Potential ordnance contamination is based on a lack of confirmed ordnance. Potential ordnance contamination is inferred from records or indirect witness. Inference from historical records would include common practice in production, storage, usage, or disposal, at that time, which could have allowed present day ordnance contamination. Potential ordnance contamination could also be based on indirect witness or from (3) Uncontaminated ordnance subsites are based on a lack of confirmed or potential ordnance evidence. Historical records evidence and present day site inspections do not indicate confirmed or potential ordnance contamination. There is no reasonable evidence, either direct or inferred, to suggest present day ordnance contamination. Additional field data is not needed to assess uncontaminated ordnance subsites.

## b. Area A: Buried Land Mines

(1) Based on the site visual inspection, review of historical documents, and disposal practices of the time, this area is considered **contaminated** in accordance with the standards of paragraph 7.a.(1).

(2) OE was noted on the site. OE items identified as practice land mine bodies were noted on the site. Magnetometer sweeps indicated more metallic items buried beneath and in the vicinity of the observed OE. These items were probably improperly disposed of by burial by an individual or individuals who did not follow proper turn-in procedures.

## c. Area B: Landfill Area

(1) Based on the site visual inspection, review of historical documents, and disposal practices of the time, this area is considered **potentially contaminated** in accordance with the standards of paragraph 7.a.(2).

(2) No OE was noted on the site during the assessment. Common practice of the time was to use an existing landfill for all manner of disposal. OE items may have been disposed of in this landfill. This area has also been identified as an HRTW site by the DOE.

## d. Area C: Staging Area

(1) Based on the site visual inspection, review of historical documents, and negative reports of found/recovered OE since site closure, this area is considered **uncontaminated** in accordance with the standards of paragraph 7.a.(3).

(2) No OE was noted on the site by the assessors during the site inspection. There was no evidence of storage structures, targets, maneuver areas or cratering particular to disposal and impact areas. An interview indicated this area was used as a staging area for over-the-road convoys for troops departing the former Camp Desert Rock (see interview I-8). Individuals familiar with the area have discovered no evidence of OE contamination in this area of the site (see interview I-1). Supporting EOD personnel have no records of OE recovery from this area. BLM officials familiar with the property had no instances of OE discovery on record (see interview I-8).

#### e. Area D: Ammunition Storage Area

(1) Based on the site visual inspection, review of historical documents, and negative reports of found/recovered OE since site closure, this area is considered **uncontaminated** in accordance with the standards of paragraph 7.a.(3).

(2) No OE was noted on the site. Individuals familiar with the site have found no evidence of OE contamination (see interviews I-6 and I-7). Documentation and maps discovered in the course of the archives search show no evidence of OE contamination. No OE items have been recovered from this area by the DOE contractor responsible for explosive ordnance disposal this area.

#### f. Area E: Radiation Dump

(1) Based on the site visual inspection, review of historical documents, and negative reports of found/recovered OE since site closure, this area is considered **uncontaminated** in accordance with the standards of paragraph 7.a.(3).

(2) No OE was noted on the site during the assessment. Individuals familiar with the site have found no evidence of OE contamination(see interviews I-6 and I-7). Documentation and maps discovered in the course of the archives search show no evidence of OE contamination. Documentation discovered during the course of the research indicated that this area was used to store radioactive sources used to calibrate radiation detection devices used during atomic testing. Sampling in the area by the DOE contractor revealed only normal background radiation in this area. No OE items have been recovered from this area by the DOE contractor responsible for EOD in this area.

## g. Area F: Remaining Land

(1) Based on the site visual inspection, review of historical documents, and negative reports of found/recovered OE since site closure, this area is considered **uncontaminated** in accordance with the standards of paragraph 7.a.(3).

(2) No OE was noted in this area during the site inspection. No OE items have been recovered from this area by the DOE contractor responsible for EOD in this area. Individuals familiar with the site have found no evidence of contamination due to OE in this area (see interviews I-6 and I-7). Documentation and maps discovered in the course of the archives search show no evidence of OE contamination.

#### 8. SITE ORDNANCE TECHNICAL DATA

## a. End Item Technical Data

(1) There is historical evidence to indicate that ordnance was used in the airspace over this site during the time period it was used by the Army Air Forces during World War II.

(2) There is historical evidence to indicate that ordnace was stored, issued, and in at least one case, disposed of by burial on the site.

(3) Table 8-1 is a listing of OE items most likely to have been expended for aerial gunnery training and stored at Camp Desert Rock for atomic battlefield training based on the scopes of the training missions and the timeframe 1941-1965, as well as observed OE on-site:

TABLE 8-1				
	AMMUNITION U	SED AND EXPLO	OSIVES/CHEMICAL FILLERS	
Туре		Model	Filler/Weight	
Cartridge, Frangible	.30 caliber	T44	107 grains lead/bakelite Smokeless Powder	
Cartridge, Rifle	.30 caliber,	M2, Ball M1, Tracer M2, AP M1, INC	Lead antimony Tracer composition Tungsten chrome steel Incendiary mixture	
Mine, AT, 1	Practice	M12	Sand	
Fuze, Mine	, AT, Practice	M604	Smoke charge	
Cartridge, Carbine	.30 caliber,	M1 Ball M16 Tracer M27 Tracer	Lead antimony Tracer composition Tracer composition	
Cartridge, Pistol	.45 caliber,	M1911, Ball	5.6 grains Powder 4648 Copper Plated Steel Bullet Gilding Plated Steel Bullet	
Cartridge, Machine G Rocket, 2.	.50 caliber, un 36"	M2, Ball M2, AP M1, M10 TR M21, M17 TR M20, API-T M1, M23 INC M6A3 AT	Soft steel Tungsten chrome steel Tracer composition Tracer composition Incendiary mixture Incendiary mixture .47 lb. 50-50 Pentolite	

TABLE 8-1				
AMMUNITION US	ED AND EXPLOSIVES/C	CHEMICAL FILLERS		
Туре	Model	Filler/Weight		
Grenade, Hand	MK 2, HE	.04625 lb. EC Powder		
	MK 3A1, HE	.4269 lb. TNT		
	AN-M8, HC	.67 lb. Hexeclorethane		
	M15, WP	.957 lb. White Phosphorus		
Grenade, Rifle	M9A1, AT	.25 lb. Pentolite		
	M22 Series, Smoke	.4 lb. Smoke Mixtures		
Shell, 60mm	M49A2, HE	.34 lb. TNT		
Mortar	M302, Smoke, WP	.75 lb. White Phosphorus		
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Shell, 81mm	M43A1, HE	Steel		
Mortar		1.23 lb. TNT		
Sholl 10mm	אד ב אא	Stool		
Sherr, 40mm	MR I & Z AA			
Choll F7mm	M202 HE	I.I ID. INI Stool		
Shell, Synan	M303 RE			
  Shall 75mm	M120 1757 T	.44 ID. INI Stool		
Sherr, /Shin	MISU, HEAT			
Shell, 76mm	M4221 HE	Steel		
		86 lb. TNT		
Shell, 90mm	M71. HE	Steel		
		2.04 lb. TNT		
Shell, 105mm	M1, HE	Steel		
		4.37 lb. TNT		
Block, Demolition	МЗ	2.25 lb. Comp C-3		
Block, Demolition	M4	.50 lb. Comp C-3		
Activator	МІ	36 grains Tetryl		
Cap, Blasting, Electric		Tetryl		
		The formed		
Cap, Blasting, Non-Electric	Cap, Blasting, Non-Electric Tetryl			
Cord, Detonating 7 lb./100 feet PETN				
Signal, Star, Para	Signal, Star, Para M17 Series Sheet Metal			
]	M19 Series	.16 lb. Illuminant		
	M21 Series	16 grains Black Powder		
1				

## b. Chemical Data of Ordnance Fillers

Table 8-2 has been developed to establish a list of typical explosive/chemical compounds used in the ordnance and chemical items cited in Table 8-1.

Table 8-2 CHEMICAL DATA OF EXPLOSIVE/ORDNANCE FILLERS				
EXPLOSIVE MATERIEL	SYNONYM(S)	CHEMICAL FORMULA		
Smokeless Powder	FNH Powder			
Various percentages of:				
Nitrocellulose	Nitrocotton	$C_3H_5(ONO_2)_3$		
Dinitrotoluene	DNT	$C_{6}H_{2}CH_{3}(NO_{2})_{2}$		
Dibutylphthalate	Gelling Agent	$C_{6}H_{4}(CO_{2}C_{4}H_{9})_{2}$		
Diphenylamine	DPA; Stabilizer	(C <sub>6</sub> H <sub>5</sub> ) <sub>2</sub> NH		
Black Powder				
74% Potassium				
Nitrate	Niter, Salt Peter	KNO3		
11% Sulfur		S		
16% Charcoal		С		
TNT	2,4,6 Trinitrotolulene	$C_{6}H_{2}CH_{3}(NO_{2})_{3}$		
YCA		CHNO		
		C <sup>3</sup> H <sup>6</sup> N <sup>6</sup> O <sup>6</sup>		
Pentolite				
50% TNT				
50% PETN				
PETN	Pentaerythritetetranitrate	$C(CH_2ONO_2)_4$		
Lead		Pb		
Iron		Fe		
Antimony		Sb		
Igniter compounds				
I-136 & 136A				
10% Calcium Resinate				
90% Strontium Peroxide		Sr0 <sub>2</sub>		
T 104				
94% Igniter Composition	1-136			

TABLE 8-2		
AMMUNITION	N USED AND EXPLO	SIVES/CHEMICAL FILLERS
Туре	Model	Filler/Weight
I-276		
84% Barium Peroxide		BaO2
16% Magnesium Powder		Mg
1-280		
85% Igniter Composit:	ion I-136A	
15% Magnesium Powder		Mg
1-508		
79% Barium Peroxide		BaO <sub>2</sub>
15% Magnesium Powder		Mg
Tracer compositions/co	ompounds*	
Barium Nitrate		BaN
Barium Peroxide		BaO <sub>2</sub>
Magnesium Powder		Mg
Sodium Nitrate		NaNO3
Calcium Silicide		CaSi
Mercury Fulminate		Hg (ON) 2
Lead Azide		Pb $(N_3)_2$
Sulfur Trioxide	FS Smoke	S <sub>2</sub> O <sub>3</sub>
Hexechlorethane	HC Smoke	$Zn + C_2Cl_6$
White Phosphorus	WP Smoke	P
Tungsten		W
*Most frequently used chemical compositions and their major ingredients		

## 9. OTHER ENVIRONMENTAL HAZARDS

## a. Hazardous, Toxic, and Radiological Waste

In 1990, an inventory was taken of hazardous, toxic, and radiological sites on the Nevada Test Site (see E-4). The inventory concentrated on known dump and burial sites. It did not focus on the many areas contaminated with surface radiation throughout the Test Site. The DOE/NV Environmental Office maintains the inventory of the HRTW sites, which is continually being updated and expanded. These sites are all HRTW contaminated due to DOE use and are not considered for FUDS purposes. However, some of these areas must be considered in light of their collocation with FUDS OE areas because the contaminants would be harmful to remediation personnel.

## b. Building Demolition/Debris Removal

During the site visit, no potential BD/DR projects were noted for consideration as a result of DOD/AAF use during the period 1941-1965.