US Army Corps of Engineers
HUNTSVILLE ENGINEERING AND SUPPORT CENTER

FINAL

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

ARCHIVES SEARCH REPORT

CONCLUSIONS AND RECOMMENDATIONS

Siskiyou Rocket and Bombing Range

Macdoel, CA
Project Number J09CA107201

April 2003

Prepared by
US Army Corps of Engineers
ST. LOUIS DISTRICT

ARCHIVE SEARCH REPORT – CONCLUSIONS AND RECOMMENDATIONS
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1 INTRODUCTION

1.1 AUTHORITY

In 1986, Congress established the Defense Environmental Restoration Program (DERP) at 10 United State Code (USC) 2701 et seq. This program directed the Secretary of Defense to "carry out a program of environmental restoration at facilities under the jurisdiction of the Secretary."

In March 1990, the Environmental Protection Agency (EPA) issued a revised National Contingency Plan (NCP). Under 40 Code of Federal Regulations (CFR) 300.120, EPA designated the Department of Defense (DoD) to be the removal response authority for incidents involving DoD military weapons and munitions under the jurisdiction, custody and control of DoD.

Since the beginning of this program, the U.S. Army Corps of Engineers acts as the agency responsible for environmental restoration at Formerly Used Defense Sites (FUDS). Beginning in 1990, the U.S. Army Engineering and Support Center, Huntsville (USAESCH) serves as the Center of Expertise (CX) and Design Center for Ordnance and Explosives. In cooperation with the USAESCH, the U.S. Army Corps of Engineers, St. Louis District, prepares Archives Search Reports (ASR) in support of environmental restoration at active DOD installations, Formerly Used Defense Sites (FUDS) and installation transitions under Base Realignment and Closure (BRAC) recommendations.

1.2 SUBJECT

Siskiyou Rocket and Bombing Range consisted of between 7,040 to 7,440 acres near Macdoel, CA located in Siskiyou County. The 13th Naval District built Siskiyou Rocket and Bombing Range as part of the range complex for the Naval Air Station (NAS) Klamath Falls (KF), located approximately 23 miles to the north of this target. By 28 May 1945 the Navy had gained use of the area primarily for a rocket target via leases and a permit. Ordnance and explosive (OE) and chemical warfare material (CWM) related features of the range consisted of a single target used for practice rockets, practice bombs and air to ground strafing practice. Following the end of World War II, the Navy placed the NAS KF in caretaker status by 10 October and removed the Danger Area designation around all the ranges. The 13th Naval District terminated the leases and permits for the Siskiyou target in January and February 1946. Plate 1 in the report plates section shows the general location of the NAS KF and its Vicinity Ranges and Facilities. Plate 2 shows the general location of the site.

1.3 PURPOSE

The ASR compiles information obtained through historical research at various archives and records holding facilities, interviews with persons associated with Siskiyou Rocket and Bombing Range and an inspection of the site. The search directs efforts towards determining possible use or disposal of OE and CWM on the former military establishment. The research places particular emphasis on establishing the types, quantities and areas of use and disposal. This process obtains information for use in developing recommendations for further action at the former Siskiyou Rocket and Bombing Range.

1.4 SCOPE

This investigation focuses on potential OE and/or CWM contamination remaining on the former Siskiyou Rocket and Bombing Range. The DERP-FUDS project number is J09CA107201. This report presents the following:

- A brief history of Siskiyou Rocket and Bombing Range
- Description and characteristics of the immediate surrounding area
- A review of related site investigations
- An aerial photography and map analysis of the site
- Real estate information, past and present
- Findings of the site inspection
- Description of the OE and/or CWM identified with the site

These factors represent the basis for the evaluation of potential OE and CWM contamination and associated risks at Siskiyou Rocket and Bombing Range.

2 CONCLUSIONS

2.1 SUMMARY OF CONCLUSIONS

2.1.1 Conventional Ordnance

The archive search discovered evidence confirming that the Navy used Siskiyou Rocket and Bombing Range for strafing, bombing and rocket target practice. The types of conventional ordnance identified as associated with the site included small arms, practice rockets, and practice bombs. The Navy fired and dropped ordnance at the one identified target of the Siskiyou Rocket and Bombing Range. The site inspection verified the use of the above listed items by locating associated OE debris. The potential explosive hazard consists of explosive contaminated scrap metal and dud ammunition. Expended caliber .30, caliber .50 and 20mm ball projectiles and cartridges do not present an explosive hazard.

2.1.2 Chemical Warfare Materials

The archive search uncovered no evidence that chemical warfare training, storage or disposal occurred at Siskiyou Rocket and Bombing Range. No identifiable remediation project exists concerning CWM at the site and the ASR concludes No DoD Action Indicated (NDAI) for this portion of the project.

2.2 HISTORICAL SITE SUMMARY

2.2.1 General Site History

The Navy built **Siskiyou Rocket and Bombing Range**[1] in the 13th Naval District during World War II. The Siskiyou target was directly associated with Naval Air Station (NAS) Klamath Falls (KF), approximately 23 miles to the north. The 13th Naval District originally intended to establish NAS KF as a Naval Auxiliary Air Station (NAAS) under NAS Seattle. It was designed to provide aerial gunnery ranges east of the Cascade Mountains in the winter, when other stations were inhibited by poor weather conditions. It was later upgraded to an NAS due to the difficulties in overseeing such a remote and isolated station. Construction began in November 1943 and the first squadron arrived three months later. The Navy commissioned the base on 12 February 1944.

[1] The Siskiyou Rocket and Bombing Range was also known as **Macdoel Practice Gunnery Range**, **Rocket Range Siskiyou National Forest**, and **Practice Rocket Range NAS Klamath Falls**. Additionally, it was often referred to by its vicinity to **Butte Valley** and the town of **Dorris**.

NAS Klamath Falls had at least 11 established range activities. Two more were proposed but use agreements were not completed prior to the end of World War II. The creation of the range complex paralleled the development of the NAS KF. The range complex development began with a large air-to-air gunnery range in Oregon and California approved in the fall of 1943. The Navy followed this with an additional air-to-air range in Oregon and Nevada, seven bombing ranges within and contiguous to the first gunnery range, and another separate bombing range. The established NAS KF target ranges at the beginning of 1945 included the following (see Plate 1):

- Klamath Falls Air-to-Air Gunnery Range No. 1[2]
- Klamath Falls Air-to-Air Gunnery Range No. 2 (not shown on plate 1)
- Goose Lake Northern Strafing and Low Level Bombing Target
- Goose Lake Southern Strafing and Low Level Bombing Target
- Clear Lake Reservoir Dive Bombing and Strafing Target
- Drew's Reservoir Dive and Glide Bombing Target
- Dog Lake Dive Bombing Target
- Gerber's Reservoir Dive Bombing Target
- Willow Valley Reservoir Dive Bombing Target
- Klamath Falls Navy Dive and Glide Bombing Target at Yonna Valley Alkali Lake

The Navy added the Siskiyou Rocket and Bombing Range to the complex a year later. The Navy's desire to field aerial rockets led to the creation of the Siskiyou target range in 1945 because the intended "tactical warfare training eliminate[d] the joint use of an area for strafing and dive bombing." By 28 May 1945 the Navy had gained use of the area for the rocket target at Siskiyou via leases and a permit. As of August 1945, the Navy expected to use Sub-Caliber Aerial Rockets (SCARs) and anticipated using "actual combat type rockets" in the future. Approved uses for Siskiyou included air-to-ground firing, high and low level bombing and strafing.

The Siskiyou Rocket and Bombing Range consisted of a target area:

> "constructed on a four-foot raised platform approximately one hundred feet in diameter. This is covered with a white cloth in order to make it visible and conspicuous. Radiating for a distance of approximately a mile from the center of the target in two directions is a straight line marked on the ground to assist the pilots in making a straight run on the target. Adjacent to the target is a device that is used to measure the angle of dive for pilots and is equipped with radio device for transmitting to pilots the actual dive angle while approaching the target. Also located at right angles to the target are two buildings that are used to house

[2] The Saint Louis District is concurrently preparing an ASR on Klamath Falls Air to Air Gunnery Range No. 1 and the bombing targets within and contiguous to it. The associated project number is JO9CA7478.

personnel to measure the accuracy of the hits on the target. The target area itself is completely surrounded by adequate fire breaks in compliance with fire protection and prevention measures deemed necessary for this type of installation."

The general excess of military establishments following the end of World War II affected NAS KF. In early October the Interdepartmental Air Traffic Control Board (IATCB) canceled the Danger Areas designated for the NAS KF ranges, including Siskiyou, and the Navy placed the station in caretaker status by 10 October. The 13th Naval District terminated the leases and permits for the Siskiyou target in January and February 1946.

2.2.2 Summary of Ordnance and Explosives Activities

An investigation of historical records did not specifically indicate the types and quantities of ordnance used on site by the NAS KF. Based on the Navy's described use of the Siskiyou target, the expected types of OE include small arms, practice rockets and practice bombs. The most common type of practice rocket in general use by the Navy at the time was the 2.25 inch SCAR (Sub-Caliber Aerial Rocket). Other types of Naval rockets in use at the time included the 3.5-inch AR (Aircraft Rocket) and the 5.0-inch aircraft high velocity aerial rocket (HVAR). The expected practice bombs would include the three types of typical Miniature Practice Bombs of the period; the iron, zinc or lead AN-MK 5 MOD 1, AN-MK 23 and AN-MK 43. The use of other types of practice bombs, such as the typical 100-pound practice sand or water filled bombs (e.g. Navy MK VII or XV) was also expected.

The ASR site visit confirmed use of the 2.25 inch SCARs, Miniature Practice Bombs, 100-pound practice sand or water filled bombs and .50 caliber small arms based on OE debris found on site. The Klamath National Forrest Goosenest Ranger District Office provided the ASR team with photographs of OE debris found in the past at the target by their archeologists. The items included in the photos were: two inert tips for 2.25-inch SCARs, three 50 caliber machine gun belt links, a .50 caliber cartridge and projectile, a 20 mm solid-jacket projectile with a non-explosive warhead. In addition to these items, the INPR site visit team reported finding debris from a 500-pound practice bomb, but examination of the OE debris by the ASR team did not confirm this assessment.

NAS Klamath Falls maintained small arms and pyrotechnic magazines and inert storage facilities. The use of high explosive (HE) bombs at Siskiyou was not confirmed by any evidence. As of 3 April 1945, NAS KF did not have magazines for storage of HE. Aerial photography interpretation noted apparent dimpling or cratering, possibly from HE, within the target center but the site visit did not confirm the presence of craters at this location. The grassland specialist with the Klamath National Forrest who reviewed the imagery thought dimpling was a natural feature.

2.2.3 Summary of Chemical Warfare Material Activities

The archive search uncovered no documentation relating to CWM at Siskiyou Rocket and Bombing Range. The archive search team found no indication that the Navy conducted CWM training, storage or disposal at this site.

2.3 REAL ESTATE

2.3.1 Confirmed DoD Ownership

The former Siskiyou Rocket and Bombing Range consisted of at least 7,040 acres of acquired property, but probably totaled as much as 7,440 acres of real estate that the Navy presumed they controlled (*see section 5.2*). The real estate acquired came from three separate owners: J.C. Stevenson owned 2,160 acres, the Butte Valley Irrigation District owned 3,920 acres and the U.S. Department of Agriculture (USDA) owned 960 acres.

By 21 June 1945 the Butte Valley Irrigation District had leased 3,920 acres of land to the Navy under leases NOy(R)-38137 and NOy(R)-38137 supplement #1. 3,910 acres of this had previously been under option contract to the USDA. This land, located in the Mount Diablo Meridian, consisted of:

T46N, R1W
Section 5, E½ Section 6
T47N, R1W
Section 29, Section 30, E½and NE½NW¼ of Section 31, Section 32
T47, R1W
S½ Section 24, NE½ Section 25

By 8 May 1945 a lease for 2,160 acres had been signed with J. C. Stevenson. The research team did not locate the original lease, but a letter lists the property leased as consisting of:

T46N, R2W
Section 1
T46N, R1W
W½ Section 6
T47N, R1W
SW¼, SW½NW¼ Section 31
T47N, R2W
SW½ of Section 25 and Section 36

On 28 May 1945, the USDA (Soil Conservation Service) granted the Navy temporary jurisdiction over 960 acres. On 6 August 1945 the USDA signed a memorandum of understanding for 960 acres consisting of:

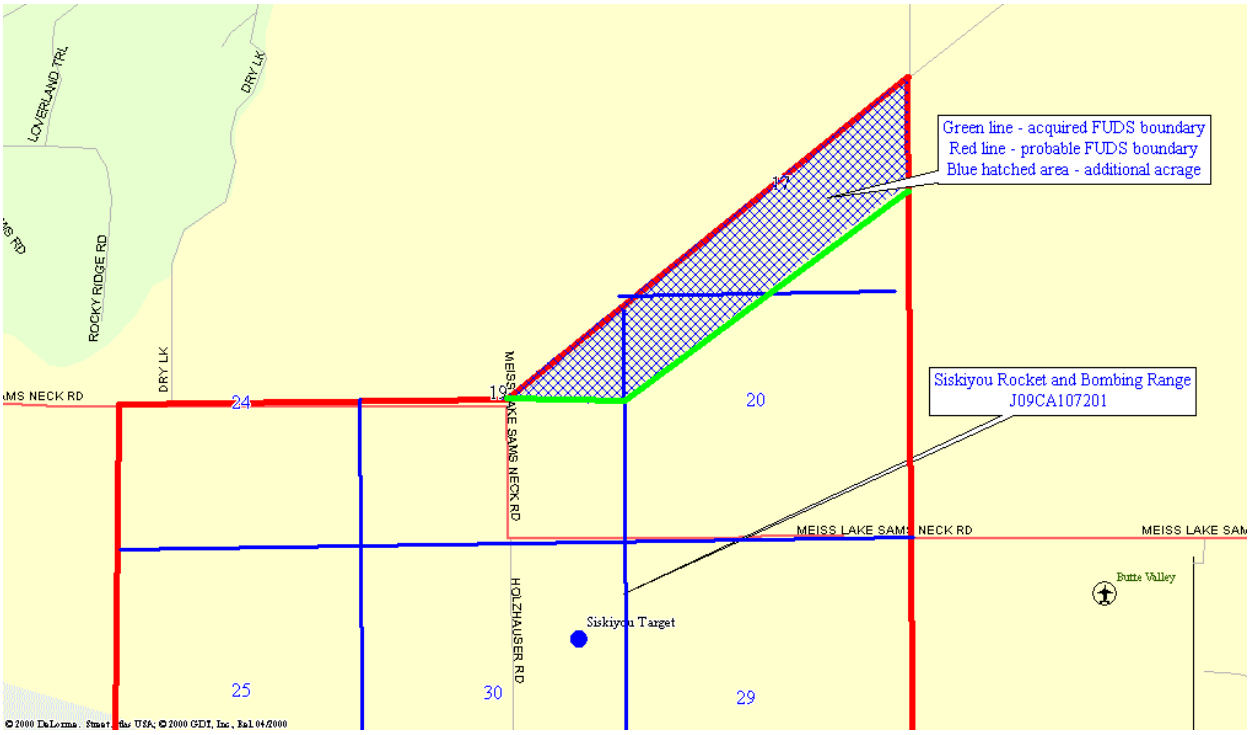
T47N, R1W
SE½SE¼ Section 17, S½ Section 19, S½, NE¼, and SE½NW¼ Section 20

Based on contemporary aerial photography, the road used to define the NW boundary of part of the site actually began about a ½ mile further west then the lease describes. This would result in an additional 400 acres of land under the Navy's control (See Section 5.2).

By 10 October 1945 NAS Klamath Falls was reduced to caretaker status, at which point none of its associated activities would be in use. Leases NOy(R)-38137, NOy(R)-38137 supplement #1 and NOy(R)-37906 were terminated on 21 January 1946. On 21 February 1946 the Navy terminated their agreement with the USDA.

The real estate figure for the acquired acreage concurs with the acreage number stated in the INPR but does not include the 400 additional acres. Based on a review of available real estate documents, the Navy released Siskiyou Rocket and Bombing Range with no restrictive covenants or land use restrictions.

2.3.2 Potential DoD Ownership



The archive search identified additional areas of probably military land use associated with Siskiyou Rocket and Bombing Range. The Navy listed Road 7 as the northwestern boundary to part of the site. However, the road is incorrectly drawn on Navy maps resulting in the following additional acreage, not officially obtained by the Navy:

T47N, R1W
Section 17 SE½SW¼, NW½SE¼, SE½NE¼
Section 19 SE½NE¼
Section 20 NW½NW¼

Since all of this land appears to have belonged to the Department of Agriculture and because the Navy had permission to use the land prior to signing a memorandum of understanding, it is possible that the Navy presumed they had control of all the land up to road 7 and the Department of Agriculture was not concerned with enforcing the memorandum.

The archive search did not identify any additional areas of undocumented military ownership associated with Siskiyou Rocket and Bombing Range. However, when range safety fans or OE potential range cells are drawn for this site, they extend beyond the acquired FUDS boundaries and potentially represent land use by the DOD. The archive search did not find direct evidence of OE hazards on the real estate contained within these fans beyond the FUDS boundary. The DOD accepts responsibility for remediation of OE hazards resulting from their activities. If DOD OE hazards exist on real estate never acquired, they are generally eligible for cleanup under the Defense Environmental Restoration Program.

2.3.3 Significant Past Ownership Other Than DoD

This investigation did not reveal any significant past ownership of Siskiyou Rocket and Bombing Range with relationship to OE or CWM.

2.3.4 Present Ownership

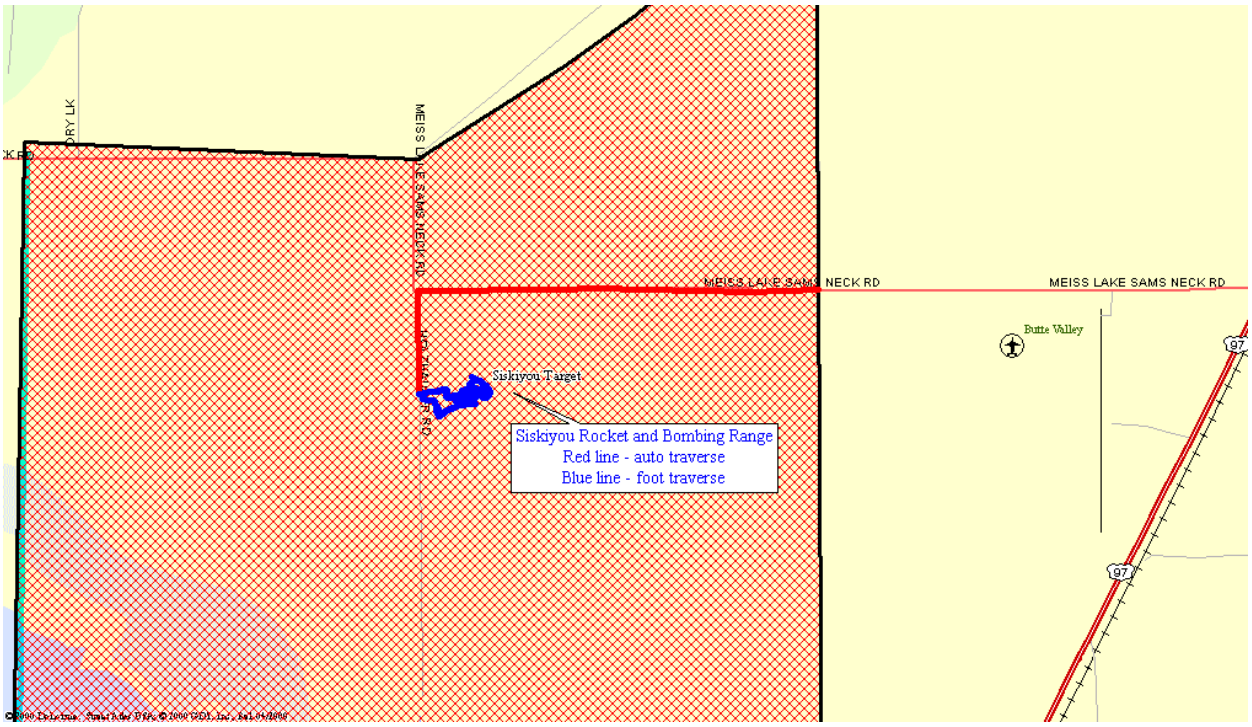
Records reviewed indicate the current property owner is the U.S. Forest Service, who manages the site under the Klamath National Forest, Goosenest Ranger District.

2.4 SITE INSPECTION

Randal Curtis, George Sloan and Alix Borrok of the St. Louis District Corps of Engineers, performed a site inspection of the former Siskiyou Rocket and Bombing Range on 25 August 2001. Appendix I of the Findings volume of this ASR includes present site photographs, and Appendix L-2 includes the trip report memorandum from the site inspection. The following paragraphs contain a synopsis of the site inspection.

The ASR team met with Jim Stout (530-398-4391) of the Klamath National Forest, Goosenest Ranger District at 37805 Highway 97, three miles south of Macdoel. Mr. Stout is the grasslands manager for the district and had led the INPR team to the site. The team held a short meeting in the district office reviewing the aerial imagery, the general history of this site and related NAS Klamath Falls targets in northern California. Mr. Stout mentioned that one of their staff archeologist had taken pictures of OE debris in the past. The descriptions matched the expected types of practice bombs and rockets but also included a "20 mm" projectile as identified by archeologist. Mr. Stout agreed to try and locate the picture of the "20 mm" and send it to the ASR team.

The team traveled to the site via Meiss Lake Sam's Neck Road north off of Highway 97. About 2.5 miles west of Highway 97, there was a gate to a dirt road (Holtzhauser Road) heading south. The team drove south about a quarter of a mile, then walked to the target site using a GPS to ascertain the location[3]. The 600-foot diameter circular perimeter of the target is marked by a short berm less than two feet high that is readily discernable. The team crisscrossed the target a number of times finding scrap weathered wood within the berm, roughly in a ring pattern around the center. Ostensibly this was the smaller 100-foot diameter aiming circle, which must have been knocked down before the aerial imagery was taken.



[3] Target coordinates were determined using georeferenced historic aerial imagery. The resulting waypoints were uploaded into a Garmin Etrex Legend GPS (Global Positioning System) receiver using mapping datum WGS 1984.

Within the bermed target area the team located OE debris from 100-lb. Practice Bombs (i.e. Navy MK VII or XV), 2.25 inch SCARs (Sub-Caliber Aerial Rocket), AN-MK 23 iron miniature practice bomb and a link for a .50 caliber machine gun. The vast majority of the items located were sheet metal from practice bombs, tailfins and expended rocket motors. The team did not find any evidence of high explosives (HE) use on the site such as cratering or HE frag. Mr. Stout thought that the dimpling observed on the aerial imagery was probably natural in origin. The team continued their examination to NE of the target berm. They then proceeded through the target and thence SW along the approximate path of the rocket approach line. Only a few OE debris items were noted beyond the target area. The team returned to the vehicle, backtracked to the district office and parted company with Mr. Stout.

Mr. Stout reported having found a bomb that looked like a larger version of an MK 23. Other people have reported finding practice bombs in the past as well. 16-17 years ago rockets were reportedly found in the area.

Range Feature Locations based on Georeferenced Aerial Photography				
Latitude	**Longitude**	**Easting**	**Northing**	**Feature**
N41 ^{o} 53’ 21”	W122 ^{o} 01’ 12”	581306	4637749	Siskiyou Target

2.5 CONFIRMED ORDNANCE PRESENCE

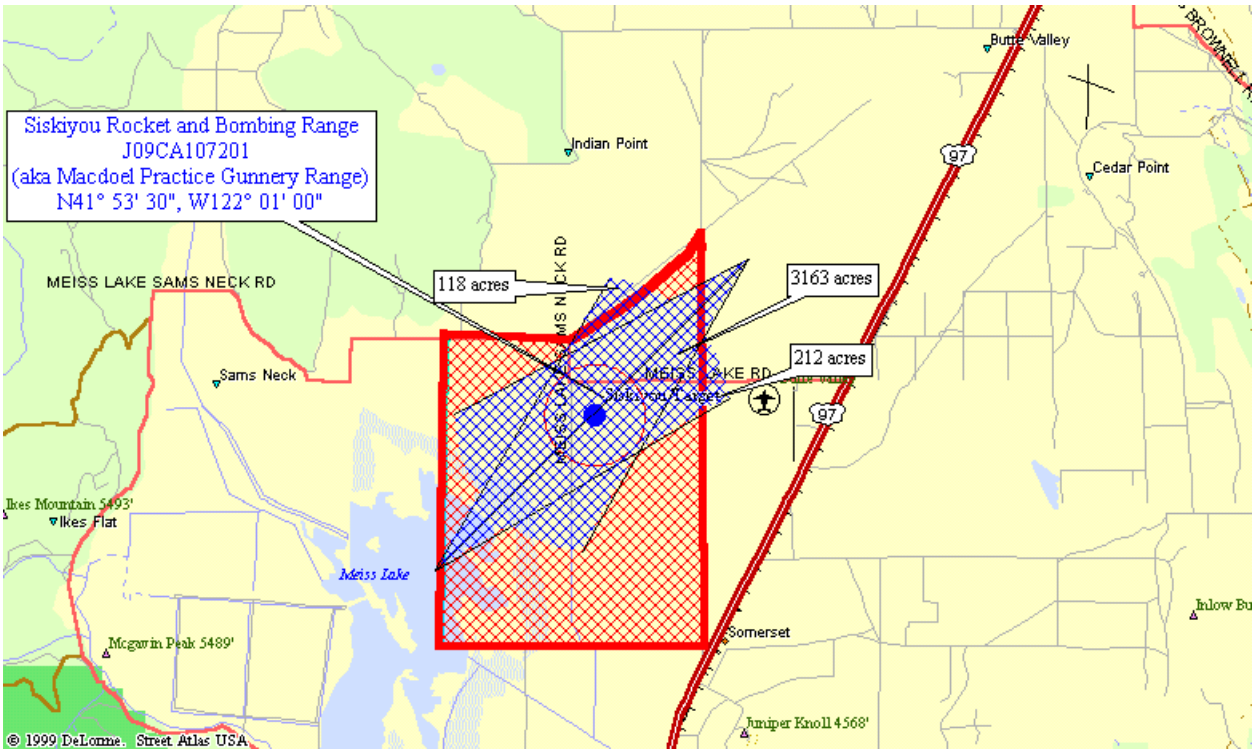
The archive search report confirmed that the Navy used small arms, practice rockets, and practice bombs at the former Siskiyou Rocket and Bombing Range. The site inspection confirmed the presence of limited ordnance debris from these items on the former bombing target. However, the archive search did not uncover any direct evidence of a current OE or CWM hazard at the former Siskiyou Rocket and Bombing Range.

2.6 POTENTIAL ORDNANCE PRESENCE

Analysis of the information gathered during the archive search identifies the following potential OE / CWM areas at the former Siskiyou Rocket and Bombing Range:

Area	Acreage (est.)	OE/CWM Related Function	OE/CWM Potential
Target - Bombing, Rocket and Strafing	3,493 acres	Bombing practice, using practice bombs; Rocket practice using practice rockets; Strafing, using ball ammunition.	**Confirmed OE Debris**, Mk 15 practice bombs, 2.25-inch SCAR, .50 caliber links and cartridge cases.

The estimate for the potential Ordnance Area of Concern (AOC) acreage was approximated using Delorme Street Atlas. The target center for the strafing, bombing and rocket firing appear to be the same location. Range cells for the bombing and rocket use were overlaid onto a site map. The rocket range cell has a safety fan of 15° originating from the ends of the 500-foot firing line, which is a minimum of 4,375 yards in front of the target area, and extends 2,734 yards beyond the target area. The line of approach was along a known northeast to southwest line. The actual approach direction is unknown, so rocket range fans are presented for both directions. The bomb range cell area was calculated to extend beyond the target center 3,000 feet, which lies entirely within the overlapping rocket range cells. Using Street Atlas's polygon sketch feature, an AOC approximating the range cell areas was drawn. The acreage was calculated as shown in the figure below.



2.7 UNCONTAMINATED AREAS

The information analyzed identified an area of approximately 4,287 acres within the probable 7,440 acres of the former Siskiyou Rocket and Bombing Range as having a no significant OE or CWM hazard potential. This area is shown as the red hatched area on the drawing in section 2.6.

The information gathered during the archive search indicated that the Navy did not store, use, or dispose of chemical warfare material at Siskiyou Rocket and Bombing Range.

2.8 SITE INFORMATION ANALYSIS

2.8.1 Conventional Ordnance Contamination

The archive search uncovered evidence that the Navy utilized conventional ordnance at Siskiyou Rocket and Bombing Range. The types of ordnance and explosives associated with the site included small arms, practice rockets and practice bombs. This information was gathered from documentation, maps, aerial photography results and interviews. None of the reviewed information indicated any other ordnance related operations at Siskiyou Rocket and Bombing Range.

The ASR team did not find an overt indication of a current ordnance and explosive hazard at Siskiyou Rocket and Bombing Range. OE debris (expended 2.25-inch

SCAR's, miniature and 100-pound practice bombs) was observed on the site along with evidence of the use of .50 cal machine guns. Research discovered no historical records indicating ordnance disposal on site. Interviews did not disclose any incidents of ordnance or explosive hazards found in the past. Aerial photography analysis did not locate any distinct signs of on-site burial. Additionally, the site inspection did not uncover evidence of ordnance or explosive hazards.

2.8.2 Chemical Warfare Material Contamination

The archive search uncovered no evidence of chemical warfare materials storage, usage or disposal at Siskiyou Rocket and Bombing Range. The mission of Siskiyou Rocket and Bombing Range does not imply the presence of CWM. Research discovered no historical records associating CWM with the site. Interviews did not disclose any correlation of CWM with the site. Additionally, the site inspection did not uncover any evidence of CWM hazards.

3 RECOMMENDATIONS

3.1 SUMMARY OF RECOMMENDATIONS

Appendix A contains the Risk Assessment Procedures for the Ordnance and Explosives Sites form. Using the information available, this form resulted in a Risk Assessment Code (**RAC**) score of **5** for Siskiyou Rocket and Bombing Range.

RAC 5 usually means that No DOD Action Indicated (NDAI) is necessary. However, since the ASR confirmed the presence of OE debris at Siskiyou Rocket and Bombing Range, further consideration may be warranted. Further action recommendations regarding ordnance and explosives or chemical warfare materials at Siskiyou Rocket and Bombing Range will originate from CEHNC. Further action can include an expanded site investigation to delineate areas of subsurface OE potential or an Engineering Evaluation/Cost Analysis (EE/CA).

3.2 OTHER ENVIRONMENTAL ACTIONS

The archive search did not reveal any additional areas of potential environmental concern associated with the military use of Siskiyou Rocket and Bombing Range.

3.3 PRELIMINARY ASSESSMENT ACTIONS

The archive search identified no additional preliminary assessment actions required as a result of investigating Siskiyou Rocket and Bombing Range.

APPENDIX A

RISK ASSESSMENT CODE PROCEDURE FORM

ETL 1110-1-165
25 NOVEMBER 1997
Previous Editions Obsolete

RISK ASSESSMENT PROCEDURES FOR
ORDNANCE AND EXPLOSIVE (OE) SITES

Site Name: Siskiyou Rocket and Bombing Range Rater's Name: Randal Curtis and George Sloan

Site Location: Macdoel, CA Phone No.: 314-331-8786 & 314-331-8796

DERP Project #: J09CA107201 Organization: CEMVS-ED-P

Date Completed: 13 September 2001 RAC Score: 5

OE RISK ASSESSMENT:

This risk assessment procedure was developed in accordance with MIL-STD 882C and AR 385-10. The Risk Assessment Code (RAC) score will be used by the U.S. Army Engineering and Support Center, Huntsville (USAESCH), Ordnance and Explosives Team (USAESCH-OE) to prioritize the remedial action(s) at Formerly Used Defense Sites (FUDS). The risk assessment should be based upon best available information resulting from records searches, reports of Explosive Ordnance Disposal (EOD) detachment actions, and field observations, interviews, and measurements. This information is used to assess the risk involved based upon the potential OE hazards identified at the site. The risk assessment is composed of two factors, hazard severity and hazard probability. Personnel involved in visits to potential OE sites should view the USAESCH-OE videotape entitled "A Life Threatening Encounter: OEW".

Part I. Hazard Severity - Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel exposure to various types and quantities of unexploded ordnance.

TYPE OF ORDNANCE
(Circle all values that apply)

A. Conventional Ordnance and Ammunition:	VALUE
Medium/Large Caliber (20 mm and larger)	10
Bombs, Explosive	10
Grenades, Hand and Rifle, Explosive	10
Landmines, Explosive	10
Rockets, Guided Missiles, Explosive	10
Detonators, Blasting Caps, Fuzes, Boosters, Bursters	6
Bombs, Practice (w/spotting charges)	6
Grenades, Practice (w/spotting charges)	4
Landmines, Practice (w/spotting charges)	4
Small Arms, complete (.22 cal - .50 cal)	1
Small Arms, Expended	0
Practice ordnance (w/o spotting charges)	0

Conventional Ordnance and Ammunition (Select the largest single value) 6

What evidence do you have regarding conventional UXO? *The site visit confirmed use of small arms, practice rockets, and practice bombs. Practice ordnance (w/o spotting charges) was selected for the 20mm target practice and practice rockets.*

B. Pyrotechnics (For munitions not described above.):

	VALUE
Munition (Containers) Containing White Phosphorus or other Pyrophoric Material (i.e., Spontaneously Flammable)	10
Munition Containing A Flame or Incendiary Material (i.e., Napalm, Triethylaluminum Metal Incendiaries)	6
Flares, Signals, Simulators, screening smokes (other than WP)	4

Pyrotechnics (Select the largest single value) 0

What evidence do you have regarding pyrotechnics? ***None***. *The archive search did not uncover evidence that this site used or stored these materials.*

C. Bulk High Explosives (HE) (Not an integral part of conventional ordnance; uncontainerized.):

	VALUE
Primary or Initiating Explosives (Lead Styphnate, Lead Azide, Nitroglycerin, Mercury Azide, Mercury Fulminate, Tetracene, etc.)	10
Demolition Charges	10
Secondary Explosives (PETN, Compositions A, B, C, Tetryl, TNT, RDX, HMX, HBX, Black Powder, etc.)	8
Military Dynamite	6
Less Sensitive Explosives (Ammonium Nitrate, Explosive D, etc.)	3

High Explosives (Select the largest single value) 0

What evidence do you have regarding bulk explosives? ***None***. *The archive search did not uncover evidence that this site used or stored these materials.*

D. Bulk Propellants (Not an integral part of rockets, guided missiles, or other conventional ordnance; uncontainerized):

	VALUE
Solid or Liquid Propellants	6

Propellants 0

What evidence do you have regarding bulk propellants? ***None***. *The archive search did not uncover evidence that this site used or stored these materials.*

E. Chemical Warfare Material (CWM) and Radiological Weapons

	VALUE
Toxic Chemical Agents (Choking, Nerve, Blood, Blister)	25
War Gas Identification Sets	20
Radiological	15
Riot Control Agents (Vomiting, Tear)	5

Chemical and Radiological (Select the largest single value) 0

What evidence do you have of chemical/radiological OE? ***None***. *The archive search did not uncover evidence that this site used or stored these materials.*

TOTAL HAZARD SEVERITY VALUE (Sum of Largest Values for A through E - Maximum of 61)	**6**

Apply this value to Table 1 to determine Hazard Severity Category.

TABLE 1
HAZARD SEVERITY*

Description	Category	Hazard Severity Code
CATASTROPHIC	I	21 and greater
CRITICAL	II	10 to 20
MARGINAL	III	5 to 9
NEGLIGIBLE	IV	1 to 4
**NONE	V	0

*Apply Hazard Severity Category to Table 3.
**If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC Score of 5 to determine your appropriate action.

Part II. Hazard Probability - The probability that a hazard has been or will be created due to the presence and other rated factors of unexploded ordnance or explosive materials on a formerly used Department of Defense DoD site.

AREA, EXTENT, ACCESSIBILITY OF OE HAZARD
(Circle all values that apply)

A. Locations of OE Hazards

	VALUE
On the surface	5
Within Tanks, Pipes, Vessels or other confined locations	4
Inside walls, ceilings, or other Building/Structure	3
Subsurface	2

Location (Select the single largest value) 2

What evidence do you have regarding location of OE? *Potential OE hazards exist in the form of possible malfunctioned spotting charges in the practice bombs.*

B. Distance to nearest inhabited location/structure likely to be at risk from OE hazard (road, park, playground, building etc.)

	VALUE
Less than 1,250 feet	5
1,250 feet to 0.5 miles	4
0.5 miles to 1.0 mile	3
1.0 mile to 2.0 miles	2
Over 2 miles	0

Distance (Select the single largest value) 0

What are the nearest inhabited structures/buildings? *No buildings were observed within 2 miles of the site. The Butte Valley airstrip lies just over the 2-miles from the target center.*

C. Number(s) of building(s) within a 2-mile radius measured from the OE hazard area, not the installation boundary.

	VALUE
26 and over	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0

Number of Buildings (Select the single largest value) 0

Narrative *No buildings were observed within 2 miles of the site.*

D. Types of Buildings (within a 2 mile radius)

	VALUE
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers	5
Industrial, Warehouse, etc	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0

Types of Buildings (Select the largest single value) 0

Describe types of buildings in the area. *No buildings observed.*

E. Accessibility to site refers to access by humans to ordnance and explosive wastes. Use the following guidance:

BARRIER	VALUE
No barrier or security system	5
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier, (any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated site	1
A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel which continuously monitors and controls entry; or an artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the area; and a means to control entry at all times through the gates or other entrances (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the area).	0

Accessibility (Select the single largest value) 3
Describe the site accessibility. *The site is rangeland with fencing present only to contain livestock.*

F. Site Dynamics - This deals with site conditions subject to change in the future, but may be stable at the present. Examples would be excessive soil erosion by beaches or streams, increasing land development that could reduce distances from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5
None Anticipated	0

Site Dynamics (Select largest value) 0
Describe the site dynamics. *This is national grassland.*

TOTAL HAZARD PROBABILITY VALUE (Sum of Largest Values for A through F - Maximum of 30)	5

Apply this value to Hazard Probability Table 2 to determine **Hazard Probability Level**.

TABLE 2
HAZARD PROBABILITY

Description	Level	Hazard Probability Value
FREQUENT	A	27 or greater
PROBABLE	B	21 to 26
OCCASIONAL	C	15 to 20
REMOTE	D	8 to 14
IMPROBABLE	E	less than 8

*** Apply Hazard Probability Level to Table 3.**

Part III. Risk Assessment - The risk assessment value for this site is determined using the following Table. Enter with the results of the Hazard Probability and Hazard Severity values.

TABLE 3
RISK ASSESSMENT

Probability Level	FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Level					
CATASTROPHIC I	1	1	2	3	4
CRITICAL II	1	2	3	4	5
MARGINAL III	2	3	4	5	5
NEGLIGIBLE IV	3	4	4	5	5

RISK ASSESSMENT CODE (RAC)

RAC 1	Expedite INPR, recommending further action by USAESCH-Immediately call USAESCH-OE-S (commercial 256-895-1582/1598).
RAC 2	High priority on completion of INPR - Recommend further action by USAESCH.
RAC 3	Complete INPR - Recommend further action by USAESCH.
RAC 4	Complete INPR - Recommend further action by USAESCH.
RAC 5	Usually indicates that No DoD Action Indicated (NDAI) is necessary, submit NDAI and RAC to USAESCH.

==========

Part IV. Narrative - Summarize the documented evidence that supports this risk assessment. If no documented evidence was available, explain all the assumptions that you made.

*The RAC score assigned to Siskiyou Rocket and Bombing Range is **5**.*

Part I received a Hazard Severity Rating of "Marginal", Part II received a Hazard Probability Rating of "Improbable". According to table 3, these ratings convert to a Risk Assessment Code of 5.

The archive search based the OE/CWM potential on the scenario that a small percentage of live practice bomb spotting charges may remain on site. Present usage of the sparsely populated site consists of cattle grazing only, managed under the national grasslands system. Due to the site size and the ordnance items, the OE potential probability remains very low.

Additionally, the ASR uncovered no evidence indicating any other type of conventional ordnance or chemical warfare materials were stored or used at Siskiyou Rocket and Bombing Range

APPENDIX B

ABBREVIATIONS, ACRONYMS AND BREVITY CODES

ABBREVIATIONS, ACRONYMS AND BREVITY CODES

The following list contains abbreviations, acronyms and brevity codes within this ASR, as well as typical others.

AAF*	Army Air Field
AA	Anti-Aircraft
ACGIH	American Conference of Governmental Industrial Hygienist
AEC	Army Environmental Center
AFB	Air Force Base
ACGIH	American Conference of Governmental Industrial Hygienist
ANSI	American National Standards Institute
AP	Armor Piercing
APDS	Armor Piercing Discarding Sabot
APERS	Anti-Personnel
AP-T	Armor Piercing-Tracer
ASR	Archive Search Report
AT	Anti-Tank
BD	Base Detonating
BD/DR	Building Demolition/Debris Removal
BLM	Bureau of Land Management
BRAC	Base Realignment and Closure
CADD	Computer-Aided Drafting and Design
CAIS	Chemical Agent Identification Set
cal	Caliber
CBDCOM	Chemical and Biological Defense Command
CE	Corps of Engineers
CEHNC	Corps of Engineers, Huntsville Engineering and Support Center
CEMVS	Corps of Engineers, Mississippi Valley-St. Louis District
CEMVK	Corps of Engineers, Mississippi Valley-Vicksburg District
CEP	Circular Error of Probability
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COE	Chief of Engineers
ctg	Cartridge
CWM	Chemical Warfare Materials
CWS*	Chemical Warfare Service
CX	Center of Expertise
DA	Department of the Army
DEET	Diethyltoluamide
DERP	Defense Environmental Restoration Program
DoD	Department of Defense

DOI	Department of Interior
EE/CA	Engineering Evaluation/Cost Analysis
EIS	Environmental Impact Statement
EM	Engineer Manual
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
ETL	Engineering Technical Letter
FGDC	Federal Geographic Data Committee
FM	Field Manual
FS	Feasibility Study
FUDS	Formerly Used Defense Sites
GIS	Geographic Information System
GPM	Gallons Per Minute
GPS	Global Positioning System
GSA	General Services Administration
HAZWOPER	Hazardous Waste Operations
HBX	high blast explosives; mixtures of RDX, TNT and aluminum
HE	High Explosive
HEAT	High Explosive Anti-Tank
HEI	High Explosive Incendiary
HEP	High Explosive Plastic
HMX	cyclotetramethylenetetranitramine (a type of high explosive)
HTRW	Hazardous Toxic and Radioactive Waste
HTW	Hazardous and Toxic Waste
HVAR	High Velocity Aerial Rocket
IAS	Initial Assessment Study
IATCB	Interdepartmental Air Traffic Control Board
INPR	Inventory Project Report
IRP	Installation Restoration Program
KF	Klamath Falls
LD	Lyme Disease
MCX	Mandatory Center of Expertise
MT	Mechanical Time
MTSQ	Mechanical Time Super Quick
NARA	National Archives and Records Administration
NAVSEA	Naval Sea Systems Command
NAAS*	Naval Auxiliary Air Station
NAS*	Naval Air Station
NCP	National Contingency Plan
n.d.	No Date
NEW	Net Explosive Weight
NGVD	National Geographic Vertical Datum
NIMA	National Imagery and Mapping Agency

NIOSH	National Institute for Safety and Health
NMAS	National Map Accuracy Standards
NPL	National Priorities List
NOAA	National Oceanic and Atmospheric Administration
NOFA	No Further Action
NPRC	National Personnel Records Center
NRC	National Records Center
NWS	National Weather Service
OCE	Office Chief of Engineers
OE	Ordnance and Explosives
OP	Ordnance Pamphlet
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PD	Point Detonating
PE	Professional Engineer
PETN	pentaerythritol tetranitrate (a type of high explosive)
PIBD	Point Initiating, Base Detonating
PM	Project Manager
PPE	Personal Protective Equipment
QASAS	Quality Assurance Specialist, Ammunition Surveillance
RAC	Risk Assessment Code
RDX	cyclotrimethylenetrinitramine; also known as cyclonite or hexogen (a type of high explosive)
RG	Record Group
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
SARA	Superfund Amendments and Reauthorization Act
SCAR	Sub-Caliber Aerial Rocket
SEP	Spherical Error of Probability
SOP	Standing Operating Procedures
SPB*	Surplus Property Board
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TCRA	Time Critical Removal Action
TEU	United States Army Technical Escort Unit
TM	Technical Manual
TNT	Trinitrotoluene
TP	Target Practice
USACE	U.S. Army Corps of Engineers
USADACS	U.S. Army Defense Ammunition Center and School
USAFHRA	U.S. Air Force Historical Research Agency
USATCES	U.S. Army Technical Center for Explosive Safety
USATHMA	U.S. Army Toxic and Hazardous Materials Agency

USC	United States Code
USCG	Untied States Coast Guard
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UXO	Unexploded Ordnance
WAA*	War Assets Administration
WAGE	Wide Area GPS Enhancemen
WGS	World Geodetic System
WNRC	Washington National Records Center
WW I	World War I
WW II	World War II

* designates an historic acronym

APPENDIX C

REPORT DISTRIBUTION LIST

Address	No. Copies
Commander, U.S. Army Engineering and Support Center Huntsville, ATTN: CEHNC-ED-SY-O (D. MARDIS) P.O. Box 1600 Huntsville, Alabama 35807-4301	2

PLATES

REPORT PLATES

1 **Siskiyou Rocket and Bombing Range** - NAS Klamath Falls and Vicinity Ranges and Facilities
2 **Siskiyou Rocket and Bombing Range** - Vicinity Map
3 **Siskiyou Rocket and Bombing Range** – Aerial Photography 1955

Thematic Computer-Aided Design and Drafting (CADD) map files completed in association with this Archives Search Report are based on historic cartographic, aerial and site visit data collected during this investigation. The thematic maps were created using Intergraph's Microstation.

The thematic maps were created by scanning and warping selected historic data to reference points collected from non-stable selected base maps such as U.S. Geological Survey (USGS) 7.5 minute, quadrangle sheets or National Imaging and Mapping Agency (NIMA) maps. The horizontal scale and horizontal datum of the base maps is generally known. In this case the datum used was 1927 North Atlantic Datum/World Geodetic System (WGS) 1984. Attempts have been made to rectify the data to the referenced base maps. However, distortions in scale and contortions of the features are present. These distortions are a result of inaccuracies in the source data, as well as the processes of scanning and rectifying the data**.** Much of the data on the maps lack sufficient information to support a determination of accuracy.

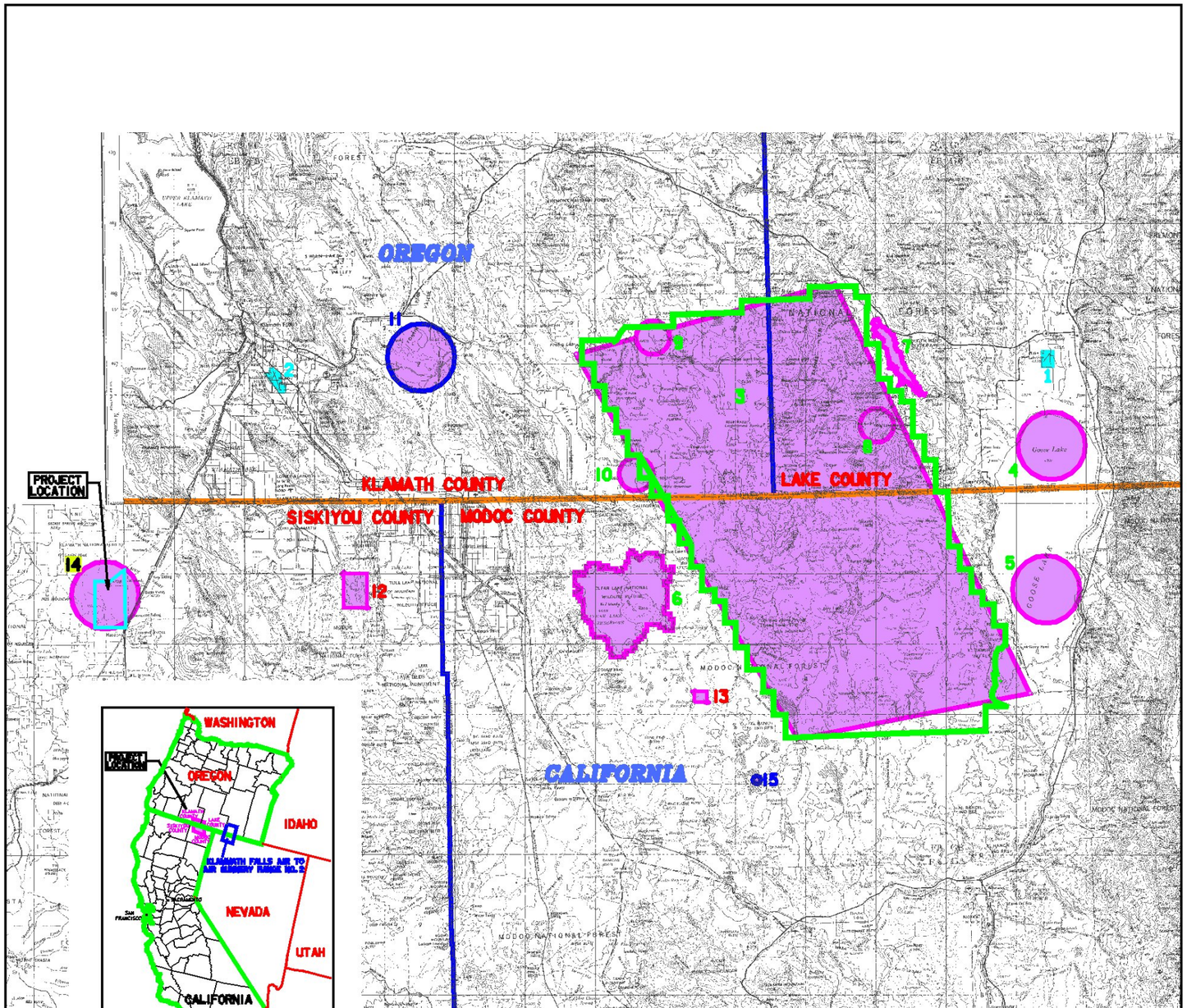
Many of the historic maps used were hand-drawn or built on locations that were inaccurate by modern standards. In general, historic map inaccuracies are unknown and not quantifiable. The unknown inaccuracies may then be magnified by the georeferencing process. Therefore, thematic maps generated from historic maps and drawings will have accuracy no greater than the least accurate source.

The historical aerial photography has been semi-rectified (georeferenced) to the base map; however, the photos have not been corrected for photogrammetric displacements such as those due to topography or the altitude of the aircraft at the time of imaging. They are not orthorectified images. Locations of features noted on aerial photography are not exact due to the rectifying of both the image and the base map.

The horizontal and vertical locations of selected features noted in the ASR and located on the thematic maps have been established utilizing Global Positioning System (GPS) technology. These coordinates were acquired using the Federal Version PLGR96+ GPS receiver. Features located utilizing GPS techniques are so noted in the ASR**.** The PLGR+96 uses the Precise Positioning Service (16 m SEP) and Wide Area GPS Enhancement (WAGE) 4 m CEP**.**

Copies of the thematic maps are included on the companion CD diskette to this report. The lineage and source of the historic data used to generate the thematic maps is

unknown. The majority of Federal Geographic Data Committee (FGDC) Metadata fields are therefore unknown. A metadata file that gives all available pertinent information has been provided with this product. The statements above are inclusive of all available information regarding the historic data sources and the thematic maps generated. The thematic maps are not original digital mapping data; are scanned and warped data with selected unique feature annotation. The intended purpose of the mapping data is for photo-interpretation and not design. The vector data and associated symbology is unique to the intended purpose. The majority of the digitized features are not part of the current Tri-Service CADD Standards list of features and associated line types and symbology (ie. range fans, pits, disturbed land). The mapping data produced does comply with applicable Tri-Service Standards.



NOTE: BACKGROUND IMAGE IS GEOREFERNCED 1:250,000 SCALE 1 DEGREE BY 2 DEGREE SERIES USGS MAP

KEY TO FEATURES:

FEATURE NUMBER	FEATURE DESCRIPTION
1	NAVAL AUXILIARY AIR FACILITY LAKEVIEW-F10OR0532
2	NAVAL AIR STATION KLAMATH FALLS-F10OR0572
3	KLAMATH FALLS AIR-TO-AIR GUNNERY RANGE NO.1-J09CA7478
4	GOOSE LAKE NORTHERN STRAFING AND LOW LEVEL BOMBING TARGET-J09CA7478
5	GOOSE LAKE SOUTHERN STRAFING AND LOW LEVEL BOMBING TARGET-J09CA7478
6	CLEAR LAKE RESERVOIR DIVE BOMBING AND STRAFING TARGET-J09CA7478
7	DREW'S RESERVOIR DIVE AND GLIDE BOMBING TARGET-J09CA7478
8	DOG LAKE DIVE BOMBING TARGET-J09CA7478
9	GERBER'S RESERVOIR DIVE BOMBING TARGET-J09CA7478
10	WILLOW VALLEY RESERVOIR DIVE BOMBING TARGET-J09CA7478
11	KLAMATH FALLS NAVY DIVE AND GLIDE BOMBING TARGET AT YONNA VALLEY ALKALI LAKE
12	MODOC MOBILE TARGET (OR KLAMATH FALLS STATIONARY BOMB TARGET)
13	SISKIYOU STRAFING TARGET (OR KLAMATH FALLS MOBILE DIVE BOMB TARGET)
14	SISKIYOU ROCKET AND BOMBING RANGE (AKA MACDOEL PRACTICE GUNNERY RANGE)-J09CA107201
15	LOST VALLEY RESERVOIR TARGET (PROBABLY ASSOCIATED WITH NAS K.F.)

LEGEND

- KLAMATH FALLS AIR TO AIR GUNNERY RANGE NO.1 &ASSOCIATED BOMB TARGETS
- OTHER IDENTIFIED FUDS ASSOCIATED WITH NAVAL AIR STATION KLAMATH FALLS
- UNIDENTIFIED FUDS ASSOCIATED WITH NAVAL AIR STATION KLAMATH FALLS
- PLANNED BUT UNCONSUMATED TARGETS FOR NAS KLAMATH FALLS; NOT FUDS
- DANGER AND CAUTION AREAS ASSOCIATED WITH NAS KLAMATH FALLS

NOTE: KLAMATH FALLS AIR TO AIR GUNNERY RANGE NO. 2 NOT SHOWN ON PLATE

0 55000 110000

APPROXIMATE SCALE IN FEET

N

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SISKIYOU ROCKET & BOMBING RANGE
SISKIYOU COUNTY, CALIFORNIA
DERP-FUDS# J09CA107201
NAS KLAMATH FALLS & VICINITY
RANGES AND FACILITIES

PROJ. DATE:	DATE OF MAP: 2001	PLATE NO. 1
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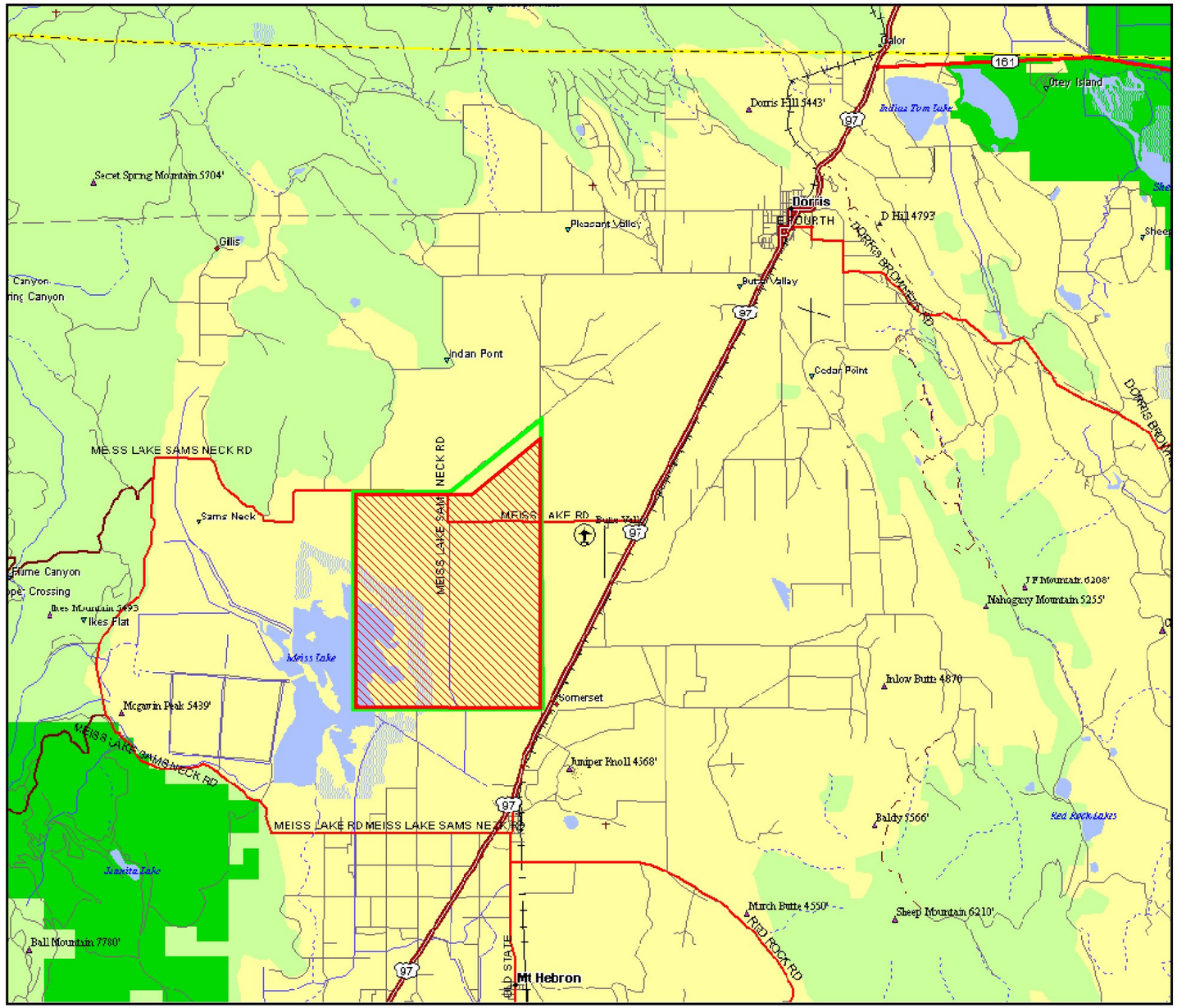

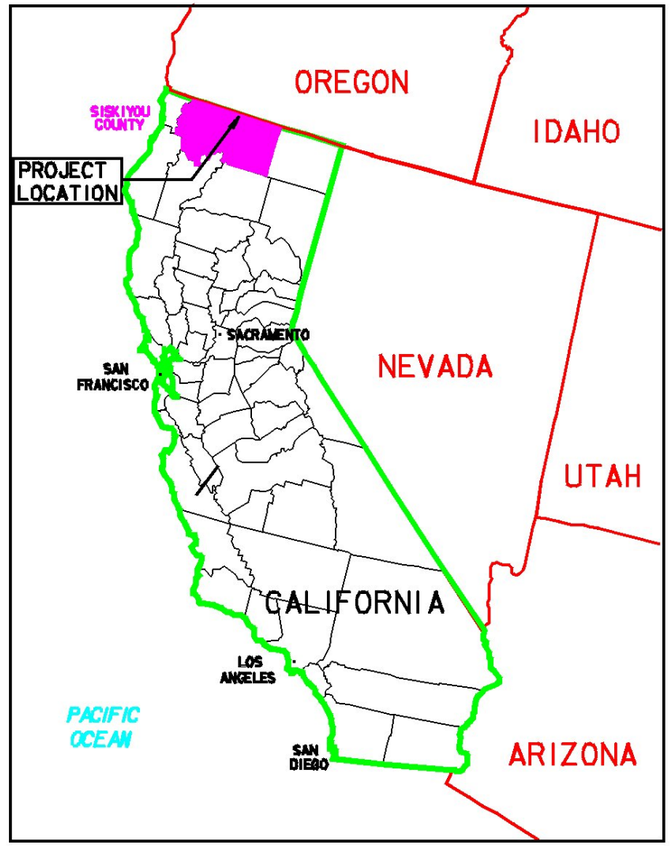

LEGEND

- PROBABLE FUDS PROPERTY (7,440 ACRES)
- ACQUIRED FUDS PROPERTY (7,040 ACRES)

N

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT

SISKIYOU ROCKET & BOMBING RANGE
SISKIYOU COUNTY, CALIFORNIA
DERP-FUDS*J09CA107201

VICINITY MAP

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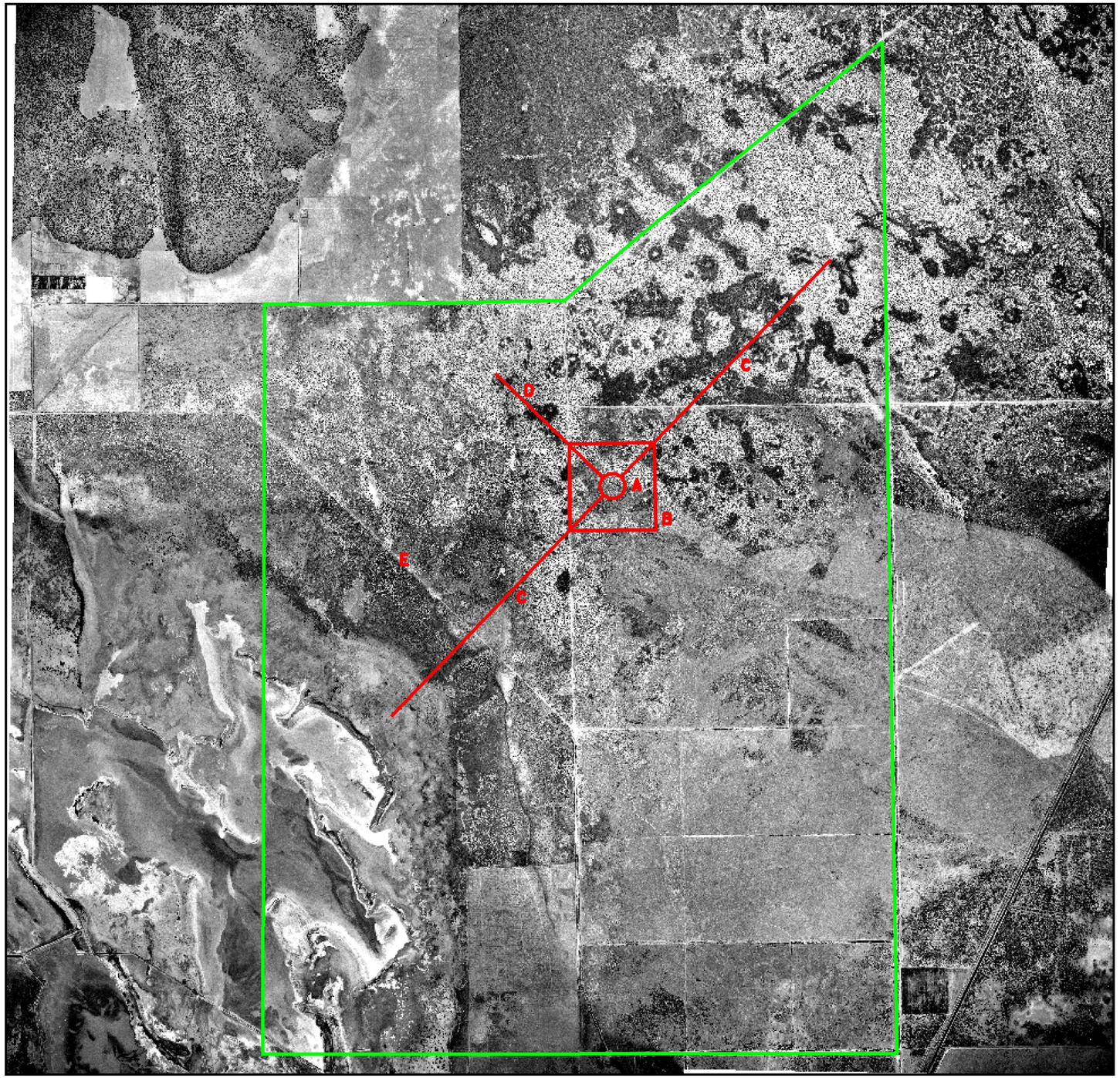

Imagery: 5 August 1955, frames DDC-7P-9, 11. 104 & 106
scale 1:24,000 from USDA - Aerial Photography Field Office
Salt Lake City, UT

A 600 FOOT DIAMETER CIRCLE, WITH 30 FOOT DIAMETER DIMPLING THAT MAY BE NATURAL BUT MAY BE THE RESULT OF CRATERING OR SCARING FROM OE USE
B 2,200 FOOT SQUARE
C APPROACH FLIGHT LINE, DIAGONAL ACROSS TARGET CONTINUING ABOUT 7,800 FEET BOTH NE AND SW FROM THE TARGET CENTER
D 4,000 FOOT DIAGONAL BEGINS AT THE CENTER HEADING TO THE NW, OSTENSIBLY FOR A RAKE STATION, THOUGH NO STRUCTURES ARE VISIBLE
E ROAD PERPENDICULAR TO APPROACH FLIGHT LINE ADDED BETWEEN 1948 AND 1951

LEGEND

PROBABLE FUDS BOUNDARY

FEATURE LOCATION

0 2700 5400

APPROXIMATE SCALE IN FEET

N

U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT

SISKIYOU ROCKET & BOMBING RANGE
SISKIYOU COUNTY, CALIFORNIA

1955 AERIAL PHOTO

PROJ. DATE: 2000	DATE OF PHOTO: 1955	PLATE NO. 3
01-NOV-2001 14:23	ts:\dew\dew2001\california\siskiyou\PHOTO\Modoc-Siskiyou.dgn	